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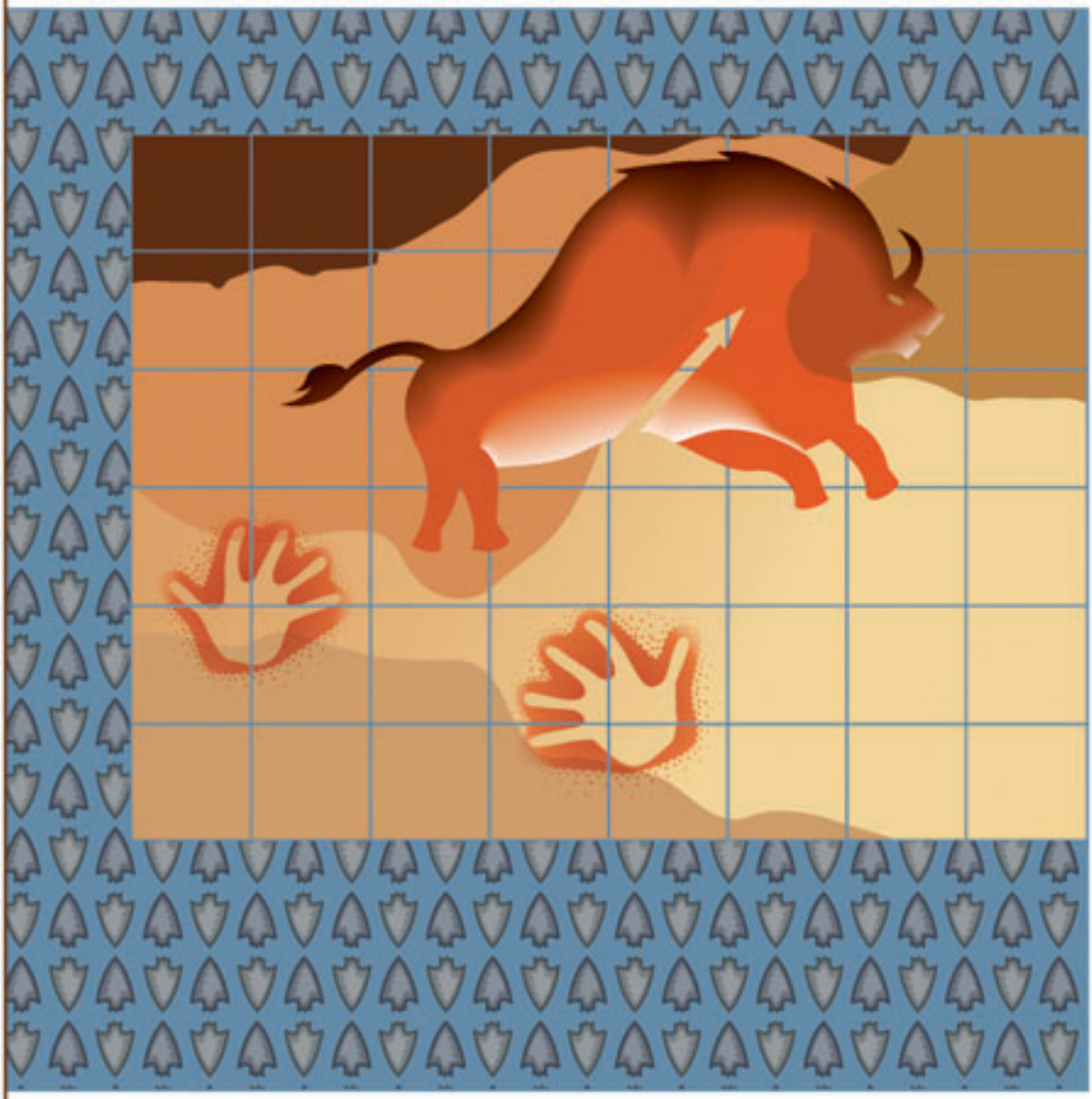
BONES & STONES



A Simulation of Early Humans Facing Challenges of the Stone Age

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Learn Through Experience

BONES & STONES

A simulation of early humans facing challenges of the Stone Age

The authors:
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BILL LACEY has been an Interact author since 1974, with over 40 publications to his credit, among them GREEKS, CIVIL WAR, VIKINGS, SKINS, WORLD HISTORY TRIALS, and the AMERICAN HISTORY ACTIVATORS series. He earned his M.A. in history from the University of Southern California and has taught in California public schools since 1963, the last 30 at Fountain Valley High School. Interestingly, the fascination for this simulation's topic germinated in a college physical anthropology class in 1959. Along with his wife Barbara, Bill has a busy family life, but he still manages to get in his running and to play as much golf as he can.

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BONES & STONES
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Introduction

PURPOSE - 1

In this simulation of early humans and the Stone Age, your students experience in a participatory manner what life was like thousands of years ago—before any written word recorded the challenges our ancestors faced in struggling to survive each day. As with all Interact classroom materials, your students become involved in their own education in a variety of exciting activities and tasks guaranteed to increase their understanding of prehistoric life. Specifically, they learn that despite the difficulty of survival, most early humans met these incredible challenges and produced cave art, stone monuments, and advances in oral communication and social patterns which we recognize today.

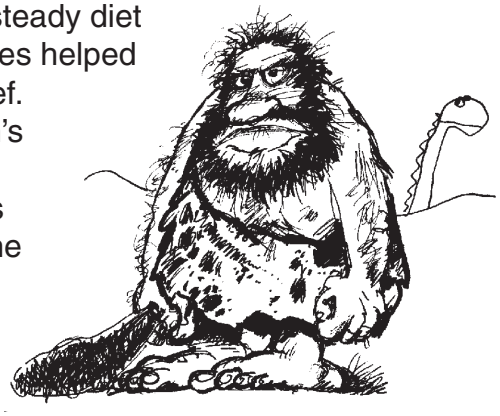
Why simulation activities on prehistoric human beings?
Most teachers likely launch world history, western civilization, or humanities courses with a unit on how early humans developed and began sharing this planet. In this BONES & STONES booklet program are interactive strategies and materials dealing with this long journey of humans to a point where they settled down to become farmers along river valleys. At the same time, these early people originated written language to record their business transactions, literary and artistic achievements, and their feelings.

We hope school districts and state-wide curriculum committees conclude that a world history course should begin before Ancient Egypt became unified and the pyramids were constructed, or before flood waters of the Tigris and Euphrates Rivers afforded Mesopotamians the opportunity to produce our planet's first civilization. In fact, archeologists have concluded that the human odyssey has origins far back, even perhaps several thousand millennia back. Thus, a solid, venturesome simulation of this important, if not an entirely neglected subject, seems appropriate for your students. In conclusion, let us summarize:

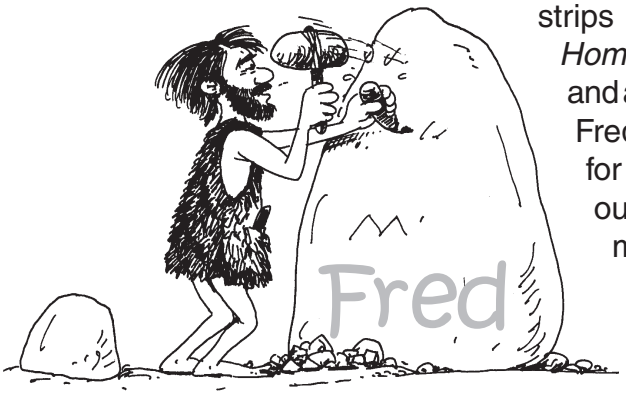
> "… lived as contemporaries struggling for survival with dinosaurs …"

Four reasons why we wrote BONES & STONES

1. Teachers at many levels are concerned when they realize that so many young people believe that prehistoric people—"cavemen"—lived as contemporaries struggling for survival with dinosaurs. The origins of this universal myth are unclear; perhaps a steady diet of Hollywood Stone Age movies helped perpetuate this ludicrous belief. Participation in this simulation's activities will help clarify the separate and distinct histories of the age of dinosaurs and the much shorter but thankfully continuous journey of early human beings.



2. In a similar fashion, BONES & STONES can help explode the myth that prehistoric people, especially men, resembled what can only be described as long haired, ugly NFL linebackers who are stooped-over, barrel-chested, grunting brutes as portrayed in comic strips for decades. The generic prototype is, of course, *Homo neanderthalensis*. Though not up to the brilliance and adaptive ability of our most popular caveman model—Fred Flintstone—Neanderthals deserve more credit for their abilities and a fair shake from the public and our students. Bedrock's most prominent citizen aside, more appropriate models are Cro-Magnon hominids. Stated simply and directly—*young Americans need to vicariously experience more accurate portrayals of early human beings' lives.*



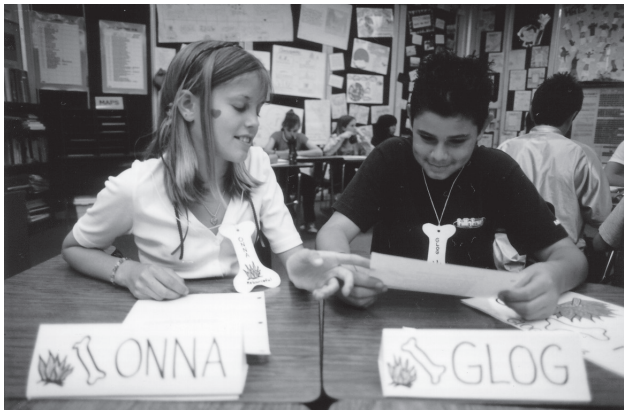
3. Our modern lives are not easy, stressless, or necessarily safe. But compared to our prehistoric ancestors, we live much less perilous lives. Think about their lives from their perspective. If you were a Stone Age hunter during the periods of glaciation, you must make a kill—today. You carefully follow, stalk, and depend on an accurate spear toss to obtain fresh meat. Such a kill must happen, or your band will be reduced to eating the few and monotonous tubers and seeds that the women have found and gathered. Nearby, large predators hover at night near your cave entrance. During the day, you worry about freezing temperatures and the snow which often covers any edible leaves and plants. Talk about daily stress! We modern men and women can appreciate our successes surviving modern life's travails, but we teachers must realize and help our students appreciate and pay tribute to the accomplishments of our ancestors. Their courage and resourcefulness lead them to overcome great dangers and challenges while living long enough to have children to continue the human race of which we are a part.

> "… we must realize and help our students appreciate and pay tribute …"

4. Survival acknowledged, the most important reason to study prehistoric people and the Stone Age is to learn what they left behind for us to glimpse: the roots of our human existence. Certainly early human skeletal remains have excited and teased our scientists to speculate about them and their existence. More important are the artifacts we have unearthed. With all the difficulties early humans faced, we marvel that our ancestors found the energy and inclination to advance the journey by discovering how to talk to one another, by making cave wall paintings, and by constructing monuments like Stonehenge, which, it must be noted, most amazes the authors of BONES & STONES. We believe your students will come away from this unit with the same awe and appreciation we feel when we contemplate such small and large monuments from our past.

Ator is joyous upon selecting ***Homo erectus*** *as his group's Seminar topic in Passage I.*

Seminarians Onna and Glog share an intellectual discovery as they read about ***Homo habilis****, preparing for their presentation.*



For four to five weeks (or shorter if you choose to cut some of the simulation's passages) your classroom will reflect Stone Age life. As Stone Agers your students journey through several passages, or phases, successfully earning Survival Stones for completing tasks and activities (e.g., hunting, painting, and constructing a Stonehenge replica). Before the first passage, students read their STUDENT GUIDE and get acquainted with the responsibilities they will have to assume in BONES & STONES. Here are brief descriptions of the six passages they may work through. (Their eventual experiences depend upon the amount of time you wish to devote to the unit and which passages you choose to implement.)

> "… chosen appropriate prehistoric names, badges, totems (band logos), banners, bags, greeting grunts, and Survival Stones …"

Introduction
This pre-passage begins the simulation with an interesting motivator. First, students are assigned to join bands (or groups) with their chosen appropriate prehistoric names, badges, totems (band logos), banners, bags, greeting grunts, and Survival Stones which will be all explained in details. Next, they read a background essay on EARLY HUMANKIND, a primer for your budding paleoanthropologists preparing for Passage I.

Passage I: Seminar
Your students' journey toward a better understanding of our human ancestors really begins in Passage I. Students participate in a college-type seminar during which the intellect, not hunting and gathering skills, is required to grasp intriguing data. Panels of scholars present findings on the five major hominid types which preceded us on this planet, the theory of evolution, and the science of paleoanthropology. These colorful presentations give students a basic education in their subject and generate enthusiasm taking them back in time to the Stone Age where they learn first hand the challenges met by early humans. The passage ends with an essay chronicling the long journey of humans from the ape-like *Australopithecus* to Cro-Magnon people of 10,000 years B.P. (Before Present).

Passage II: Survival
Living now in bands of four to five cleverly named members (e.g., Rock Band), students enter the Stone Age and learn to survive by: building a fire without matches, appreciating the merits of a Stone Age diet, creating and using a spear and spear-thrower (projects are exhibited and demonstrated later in Passage ~~III~~: Megaliths). Students also simulate spear tosses during hunting and gathering concentration game to win Survival Stones.

> … they invent words and write prehistoric dialogue, including grunts, body language, and gestures.

Passage III: Language

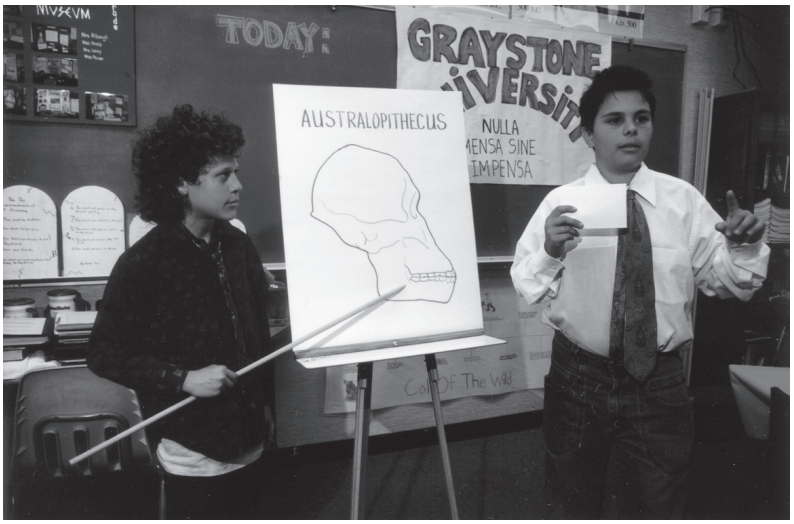
Over the millennia, primitive humans developed an oral language in order to communicate and cooperate in successful hunts as they sat around a cave hearth. Students may view a snippet from a film (e.g., the "Flintstones") before moving on to a background essay on oral language development. Next, each band receives a SCENARIO CARD, from which they invent words and write prehistoric dialogue, including grunts, body language, and gestures. Last, band members perform their script as others try to interpret this new "language" at the clan gathering.

Passage IIII: Cave Art

Now skilled in hunting, gathering, and survival techniques, students enter dark "caves" (a dimly lit hallway, classroom or multipurpose room) in order to experience cave wall painting depicting scenes similar to those found in impressive abundance at Altamira (Spain) and Lascaux (France). They use natural materials for brushes and paint to portray bellowing bison, trotting horses, auroch or lions. The last activity of this passage is an interview with a Stone Age family—not a cartoon character.

Passage ~~III~~: Megaliths

Assuming the responsibility of constructing a replica of England's mysterious circles of megaliths called Stonehenge, student engineers marshal their labor force of Neolithic Britons, then organize and carry out the arduous task of transporting heavy stones (cement bricks) over log-rollers from far-flung quarries. Next, to simulate workers with the incredible weight of the real 40-ton sarsen stones, students, with the use of one hand and the other on their back, raise the stones into place using levers and twine. Instantly students comprehend why cooperation on such tasks was essential for early humans. This feat requires mathematical exactness as specified on the ENGINEERS BLUEPRINTS, which are included.



Taking on the responsibility of their portion of the Earth Band's presentation, Plop and Pondo excite other seminarians about the 500cc brain capacity of ***Australopithecus****.*

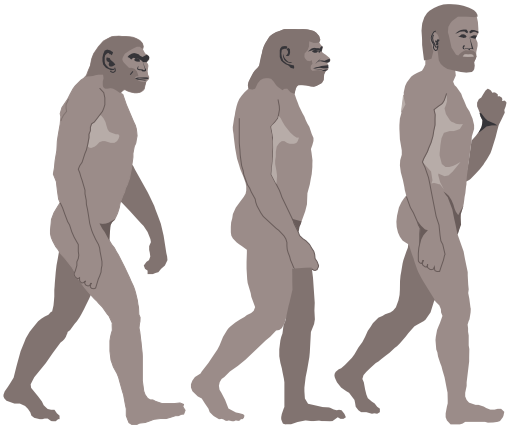
> “… attend and participate in a conference of archeologists …”

Passage ~~IIII~~ I: Conference

After surviving, communicating, painting, and building, students leave the Stone Age and return to the present to participate in a conference for archeologists. Here they exhibit and demonstrate the tools they have fashioned and draw conclusions about Stone Age life, culture, and technology. An arduous review session of “orals” leads to a COMPREHENSIVE FINAL exam. Last, each student is awarded a GRAYSTONE UNIVERSITY DIPLOMA with a Doctorate in Prehistory during an impressive graduation ceremony. A few students receive special magna cum laude recognition—those who have shown outstanding work habits and those who have accumulated the most Survival Stones during this exciting journey from primitive *Australopithecus* to the complex *Homo sapiens sapiens*.

Final comment

After completing the various challenges and tasks in BONES & STONES, your students will have experienced the following skills: critical thinking, speaking, listening, band work, and writing—always writing. Furthermore, they will have had opportunities to test some of their physical skills as well as challenge their aesthetic talents. Most important, your students will have “released their creative spirits,” exhibiting that vital human quality that somewhere, somehow, originated with those incredibly durable early human beings we call our ancestors.



One of the two classes of sixth-graders at Sowers Middle School in Huntington Beach (CA) who “met the rigorous challenges of BONES & STONES” as it was pilot tested during the 1997-98 school year. Both authors wish to acknowledge and thank them for their cooperation, enthusiastic participation, and valuable feedback, enduring along the way carpet burns on their knees, one or two bumps on their heads, paint on their clothes, and the blinding light of flash photography.

Teaching Tip →

If you have used Interact simulations before, you should have many strong images in your "mind's eye" that give you pleasure.

1. **Understanding BONES & STONES**

The adventure you are about to begin will challenge you as well as your students. First of all, relax. Do not be overwhelmed by the size of BONES & STONES. Take time to study its contents thoroughly. Doing so will allay your fears and excite you about what is ahead for you and your Stone Agers. Just visualize your kids in a multipurpose room constructing Stonehenge out of bricks after dragging the bricks 15 feet on paper towel cores using only twine and one hand to maneuver the "stones" from quarry to building site. The challenge and teamwork required will bond them for the entire year. Second, as you read, start considering right away which of the many activities and background essays in each passage you think you will want to use. Consider, of course, your students' age/abilities and your time constraints. ***Note**: You do not have to do all the passages or activities in BONES & STONES' 25 teaching days (school periods).*

2. **Decision about time**

After studying the activities in this program and the **Unit Time Chart** on page 16, decide between the two approaches immediately below:

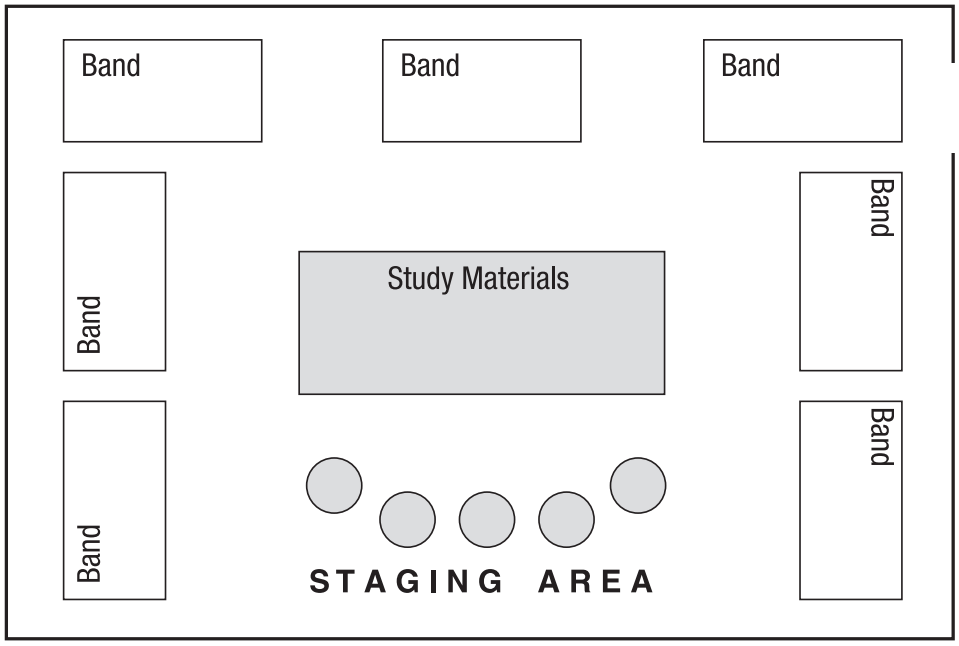
a. **Use portions of the booklet within your regular early humans/prehistoric people unit**
   Decide how many teaching days you can give BONES & STONES and then reread all passages and activities you would like to use to supplement your existing early humans unit. We particularly recommend these "stars" of the simulation: the hunting and gathering game from the **Survival** Passage; the oral language scenario from the **Language** Passage; the cave painting activity from the **Cave Art** Passage; and the Stonehenge construction from the **Megaliths** Passage. If you chose to do only these over five to seven days, they would be a solid supplement to your own existing unit. Keep in mind that these activities need some transition between them so students can see connections. Actually, any one or two of these "stars" inserted carefully into your existing unit would enlighten and excite your students.

b. **Use the complete notebook simulation**
   Using all of **BONES & STONES** is time well spent if your particular schedule can afford it. Without doubt, students will long remember their involvement in this simulation. This is an Interact promise. The authors' many years of combined experience (over 65 years in 1998) in the classroom with interactive history lessons, and the piloting that was part of developing these particular activities in **BONES & STONES,** bolster this guarantee of success. Of course, feel free to extend or reshape your existing unit with your own ideas. For example, add a few videos (see our list on pages 14–15 for ideas), tapes, study trips, or speakers you have available.

3. **Duplication**
Prepare your handouts by duplicating the following **Master Pages:**

- CLASS ROSTER—*one to post on the bulletin board*
- STUDENT GUIDE—*class set*
- SURVIVAL STONES TALLY—*one per band*
- TOTEM BADGES—*class set*
- SURVIVAL STONES BAG—*one per band*
- BONES & STONES NAMES—*one per band*
- EARLY HUMANKIND—*class set*

4. **Room arrangement**
Your room environment will greatly affect the simulation's success. How much you do to create a "Stone Age" ambiance will depend on your time and your energy. Here is a possible room arrangement; you would have to change it to fit your situation during each of the passages. Here are some room "flourishes" for this simulation:



Teaching tip →

Of course, every veteran teacher knows the dividend earned by the end of a unit or school year when extra touches or flourishes have been part of a simulation.

a. **Students in bands:** As you divide students into bands, make some initial effort to create an atmosphere in your classroom, including graphics on your boards, your own personal enthusiasm, and any other techniques to excite your Stone Agers.
b. **Illustrations:** In addition to what you already have (e.g., pictures of Stonehenge, Lascaux, and Altamira; Louis Leakey at work; the Iceman, etc.), consider creating a cave-like atmosphere by crumpling up brown butcher paper to cover walls.
c. **Bulletin boards:** Captions for bulletin boards might include **"BONES & STONES"** … **"THEN AND NOW"** … **"SURVIVE THE STONE AGE"** … and?

d. **Room configuration:** Be flexible with room configuration, for each simulation passage has its own unique requirements. Consult Daily Directions in each passage for more specific information. Before the Seminar activity, separate the class into seven distinct sections of the room. (Arrange tables/desks for four to five students.) These work areas could remain throughout most of the simulation, but they will need to be rearranged somewhat for other passages. Once students create their totems and Survival Stone bags, have a designated place in the room from which to hang them or a place to store them. One piece of butcher paper on the wall could be used to keep a tally of each band's Survival Stones total.

Teaching Tip →

The illustration of a possible room arrangement on the previous page is a suggestion to get you started. Any arrangement you first use must be reshaped to fit whatever happens during the passage.

5. **Grouping your students**

Divide your class into five to seven bands of five or more students per band by the end of this pre-passage. Choose as to who goes into what band. Place one or two capable students into each band. Likewise, distribute the less capable students equally. Also consider boy-girl numbers, as both genders are needed during the HUNTING/GATHERING GAME taking place in the Survival passage. Finally, consider artistic, dramatic, and kinesthetic abilities for each band.

6. **Leadership**

As part of your grouping strategy, consider the balance you've attempted to achieve (gender, IQ, age, maturity, ethnicity, learning styles, etc.) and make sure at least one of the band has leadership qualities or potential. Then, after deciding who the band leader will be (and noting the choices on the CLASS ROSTER), allow that one person to guide his/her band through the Passage I or II. At that point, change leaders as often as you like, or stick with your original choice.

7. **Grading and Survival Stones**

Bands should keep a record of Survival Stones earned for work done during each passage. This record could also include supplemental work you assign from a textbook, video notes, other projects, etc. Here are recommended guidelines for awarding Survival Stones:

- Routine tasks and assignments 1-5
- Totem badges..... 1-5
- Seminar notes 1-5
- Ancient tool making and presentation 1-10
- Cave painting 1-10
- Building Stonehenge 1-10
- Oral language scenario performance..... 1-10
- Found poem 1-5

Be aware that some students may try to buy and use their own similar-looking stones to outdo the other bands. Tell them that you will be looking for this unfair, unethical, and dishonest strategy. Perhaps you could use a unique kind of rock or pebble stones. Check a local hardware or building materials store for your options. In any case, utilize small (but not too small) pebbles to hand out for tasks. Our best advice is that besides giving students Survival Stones, you should grade and record into your grade book each student's work.

Teaching Tip →

One case, Edwards *v.* Aguillard *(1987) invalidated Louisiana's "Creationism Act" which had prohibited the teaching of the theory of evolution in public school unless accompanied by instruction in creation science. See also* Epperson *v.* Arkansas *(1968). In California,* Seagroves *v.* State of California *(1981) has similar significance.*

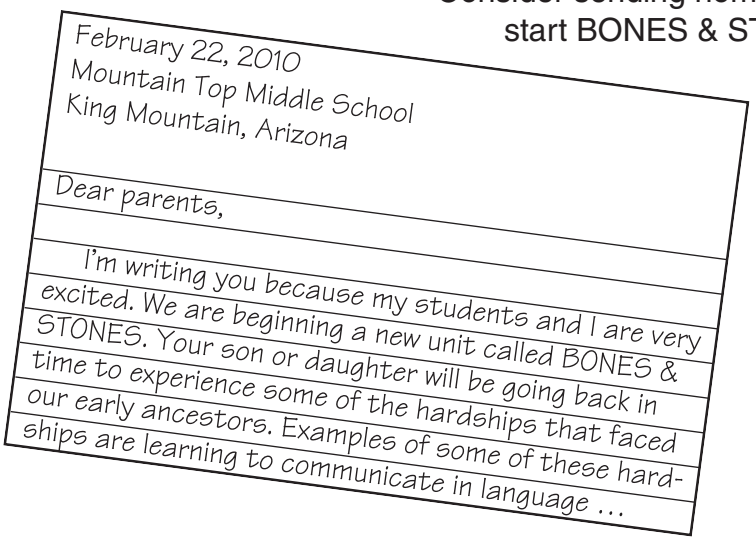
8. **"Evil-ution?"**

Possibly you will have in your classes students whose religious beliefs preclude acceptance of any scientific explanation of human origins, specifically the theory of evolution. Many school boards struggle with parents and groups who insist that the Biblical story of Creation needs no rival explanation. The authors have not taken a controversial stand, as you'll read in the background essay. Yet, we recognize that most states have prohibited mention of, or have not given credibility to, "creation science," the Biblical version of human origins. Recent U.S. and state supreme court decisions have made it clear by invalidating the numerous challenges from conservative Christian groups to get their ideas into school classrooms (especially science courses).

Thus, you should make it clear to all students that evolution is an accepted scientific explanation and is not controversial in scientific circles. "Creation science," after having been examined thoroughly by leading scientific societies, has been rejected. This being the case, your refusal to allow any discussion of "creationism" as an equal to the theory of evolution should not presuppose that you or any other educated person doesn't believe in the Bible or God. Hopefully, your approach to all this will result in a minimal defense strategy, but be prepared to deal with this possibility in BONES & STONES.

9. **Notifying parents**

Consider sending home a letter to parents a week before you start BONES & STONES. Tell them about the simulation. Included in what you send could be a Unit Time Chart and a STUDENT GUIDE. Such a letter could prevent later misunderstandings and might motivate some parents to offer help for specific days on which adult assistance and supervision would make your job easier.

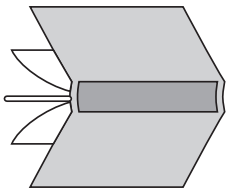


February 22, 2010
Mountain Top Middle School
King Mountain, Arizona

Dear parents,

I'm writing you because my students and I are very excited. We are beginning a new unit called BONES & STONES. Your son or daughter will be going back in time to experience some of the hardships that faced our early ancestors. Examples of some of these hardships are learning to communicate in language ...

Prehistoric Cave Painting



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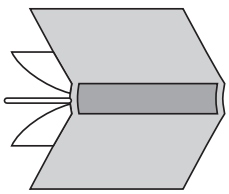

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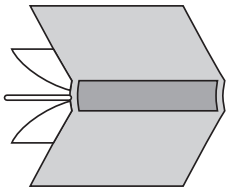

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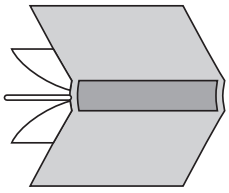

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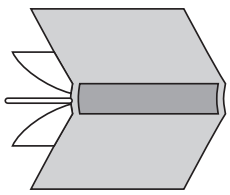
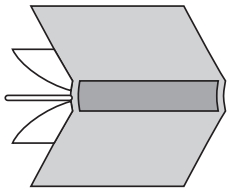


Java Man



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UNIT TIME CHART—Alter as desired.

INTRODUCTION (3 DAYS) >>>>>>>>>>>>>>>>>>>>>>>>>>>			**PASSAGE I: SEMINAR (3 DAYS) >>>>>>**	
Motivate the simulation Read STUDENT GUIDE Set up the simulation Move into bands **1**	Band work on logo, totems, Survival Stone bags, and names **2**	Grunts, etc. EARLY HUMANKIND essay Clarification Short portion of a video **3**	Seminar topics GUIDELINES FOR PRESENTATIONS Transparencies Bands work on presentations **4**	Work on presentations NOTE-TAKING/ NOTE-MAKING MODEL Begin presentations **5**
>>>>>>>>>>>>>	**PASSAGE II: SURVIVAL (4 DAYS) >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>**			
Continue and complete presentations Review presentations Award Survival Stones: presentations **6**	Award Survival Stones: logos, bags, badges, etc. HUNTING AND GATHERING essay Fire-making **7**	Explain Hunting & Gathering Games Set up and play the games Follow-up **8**	Award Survival Stones: Hunting & Gathering Games PREHISTORIC TOOLMAKING essay/assignment Spear-thrower **9**	Flexible time or appropriate video **10**
PASSAGE III: LANGUAGE (5 DAYS) >>				
Motivate the passage ORAL LANGUAGE DEVELOPMENT essay LANGUAGE SCENARIOS Work on above **11**	Bands work on scripts for LANGUAGE SCENARIOS **12**	Complete preparation on scripts Begin presentations THE GREAT GOO-BUR **13**	Continue presentations Introduce CAVE COURT CASES **14**	CAVE COURT CASES **15**
PASSAGE IIII: CAVE ART (3 DAYS) >>>>>>>>>>>>>>>>>>>>			**PASSAGE ~~IIII~~: MEGALITHS (3 DAYS) >>>>**	
Motivate the passage CAVE ART Essay Demonstrate cave painting Set up designated room for above **16**	Set up cadres Cave Painting activity Presentations Reminder: Toolmaking assignment **17**	VISIT WITH A STONE AGE FAMILY Video on cave art Arrange for room for megalith activity **18**	Motivate the passage MYSTERIOUS STONES OF PREHIST. essay "Found" Poems Confirm room for bldg megaliths **19**	"Found" Poems due Megalith Construction day If there is time, debrief **20**
>>>>>>>>>>>>>	**PASSAGE ~~IIII~~ I: CONFERENCE (4 DAYS) >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>**			
Debrief? Read and collect "Found" Poems Video–Stonehenge Secure room for toolmaking exhibit due the next day **21**	Motivate the passage Toolmaking exhibit and presentation Start presentations **22**	Continue with Toolmaking presentations **23**	Continue with Toolmaking presentations COMP CARDS for "Orals" review for COMPREHENSIVE FINAL exam **24**	COMPREHENSIVE FINAL exam Graduation, honor high achievers, bestow Diplomas Debrief **BONES & STONES** **25**

DAILY DIRECTIONS - 1

Day 1: Introduction

1. Complete the CLASS ROSTER sheet by writing students' names into each of the band groupings. Decide on the classroom set-up you want for the activities you have chosen. Evaluate how many bands each class will have and how to separate your classroom to give ample space to each band. In addition, make some decisions about **where** you'll stage each of these:
   - Language Scenarios
   - Cave Art
   - Megaliths Activity
   - Tool Exhibit (see below)
   - Graduation Ceremony

   We assume that you can carry out the rest of the activities—Hunting and Gathering Game, seminar groups, presentations, any demonstrations, video showings, even the Tool Exhibit and presentations, etc.—in your classroom's confines or just outside your classroom on an athletic field or some other adjacent space.

2. To start the simulation, try this brief opening motivator. Ask students to consider what their lives would be like if they weren't able to do the following:
   - Ride around in an automobile
   - Light a match
   - Microwave food
   - Wear easy-to-care-for clothes
   - Watch TV or listen to the radio
   - Turn on electric lights whenever they want to do so
   - Go outside safe from large, hungry animals hunting for fresh human meat

Teaching Tip →

Visually … Try turning the lights off and on, lighting a match, listening to the radio, and microwaving a cup of coffee or soup in class simultaneously. Students will get the idea of how different we are from early humans.

3. Tell students that many of our modern conveniences have been around only for a century or less. Explain how the danger of lurking wild animals is still a threat in certain parts of the world. Now, have them consider going back 25,000 years to when our prehistoric ancestors, the real Fred Flintstones, had to start a fire with friction, could eat only what they killed or pulled up from the ground and in general led lives that were, as Thomas Hobbes has pointed out, "Solitary, poor, nasty, brutish, and short".

4. Tell students to prepare for a personal trip into the Stone Age, a long period of time (from 3 million to 3,000 years B.P.) when stone, bone, and wood—not metal—were the primary materials used to construct tools and implements. Hint or state that their upcoming experiences will be *indelible*.

5. Hand out the STUDENT GUIDES. Choose various good readers to read aloud as others read silently. If your students use colored marking pens, have them highlight certain parts of the STUDENT GUIDE which they feel—or you feel—are particularly important.

Teaching Tip →

6. At this point, you may want to show some actual Stones that will be awarded.

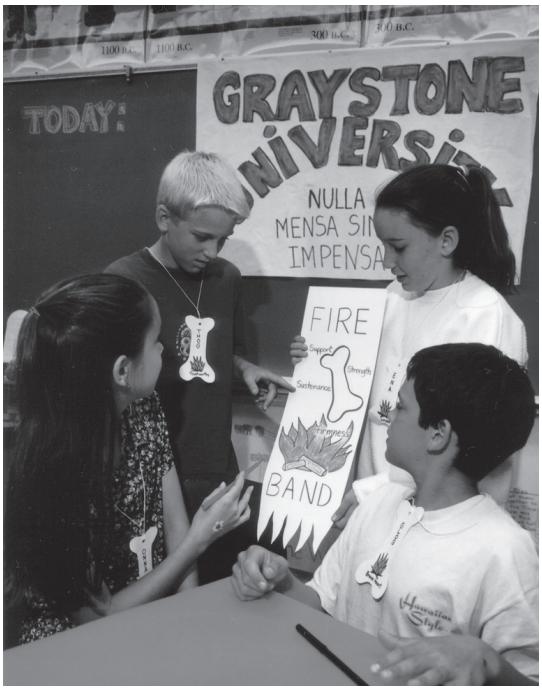
6. Briefly discuss, too, why you are using materials and activities from BONES & STONES rather than the "usual", traditional learning techniques. Answer any questions students may have regarding the different passages, goals, or subject matter.

7. Put students into bands using the CLASS ROSTER sheet you filled out previously. Tell them it is important that they feel some affinity for their new band, especially after the band comes up with its totem, banner, handshake, and greeting grunt.

8. Hand out one SURVIVAL STONES TALLY sheet to each band.
   a. As students examine this sheet, make them aware that unlike many Interact simulations where students keep individual points, this simulation exalts a band's survival, not an individual's personal success.
   b. Balance this comment with this comment: "Maximum individual efforts within each band almost ensures not only survival, but personal success, too."
   c. Go over when and how often they earn Survival Stones. Earning Survival Stones begins with an attractive band folder, a totem, a banner, a grunt, a handshake, and a Survival Stone Bag.
   d. Finally, if you use portfolios for authentic assessment in your teaching, give examples of students' simulation work to be completed and placed in their course portfolios.

*9. If you can, locate some athletic logos from sports team to show as examples for totem symbols. Have students come up with examples and put these on the board for discussion: "What are the attributes of, say, the **Wisconsin Badgers** or the **Minnesota Gophers**."*

9. If you have time, have students work on coming up with a banner, handshake, greeting grunt, and totem symbol, the latter being clarified after going over the TOTEM BADGES instruction sheet.



Chosen as the Fire Band, these Stone Agers work on and take pride in their banner.

Day 2: Band Work

Teaching Tip

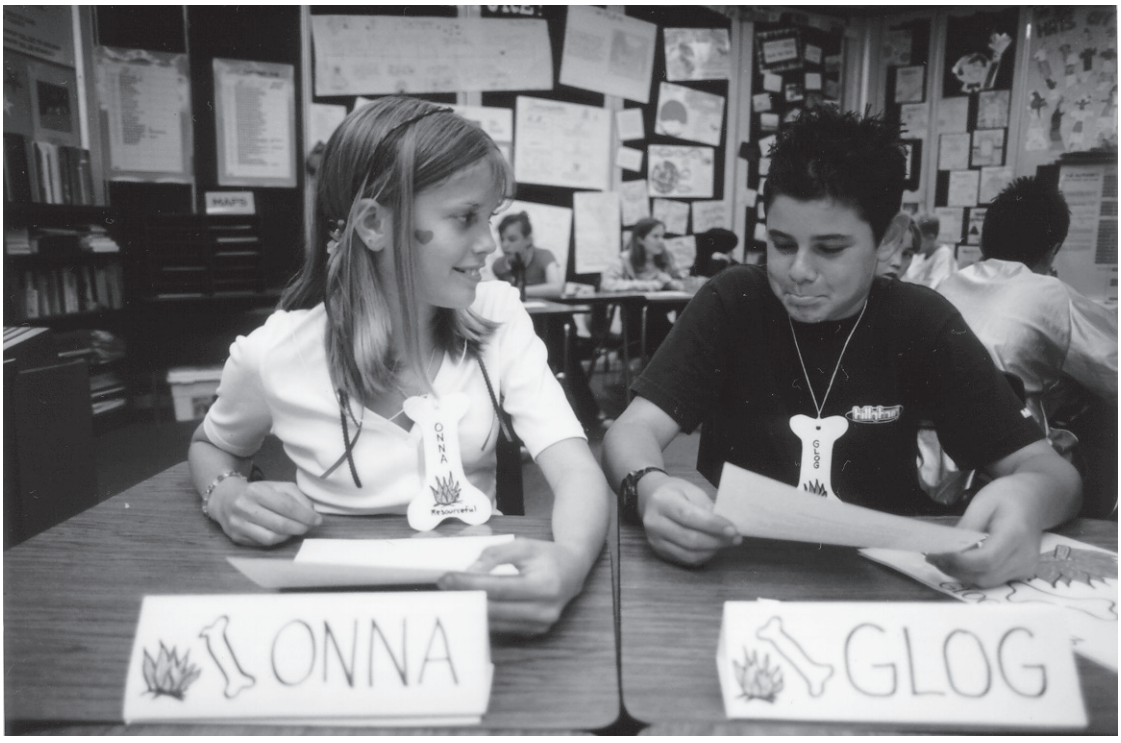
*At some point, take a vote on what to call the **clan**—that is, what to call the entire class made up of all bands. (See CLASS ROSTER sheet for possible choices.)*

1. Perhaps you can come up with your own prehistoric greeting grunt and body language with which to open class each day. When we did this during pilot testing, we captured students' attention instantly and modeled appropriate grunts and body language for bands to emulate and even surpass!

2. Allow band members to continue coming up with a band totem, banner, etc. Within 20–30 minutes, they should have some solid ideas, which might include a decorated folder, a banner, an agreed upon handshake, and greeting grunts/body language.

3. Hand out instructions to make the Survival Stone Bag which will be used to hold the band's Survival Stones. One member of each band will need to complete the Survival Stone Bag assignment which will be due no later than the end of Passage I: SEMINAR, when the first Stones will be handed out.

4. Assign or allow students to select their BONES & STONES NAMES (page 4 of the STUDENT GUIDE). Each clan member should have a Stone Ager name that differs from every other clan member. Assign students a due date for using their names on all papers and on their totem badges. Totem badges are required to be worn around the neck or pinned to the front of the shirt.



Onna and Glog with their totem badges worn around their neck

DAY 3: COMMUNICATION

1. Start with the greeting grunt and body language you have created to stimulate the class. Consider making the grunt and body language clearer (more "human") as each week passes to show how prehistoric humans became more skilled in communication over time.

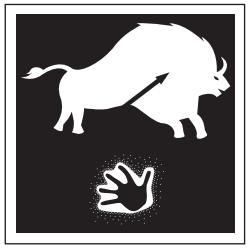
2. Again, remind students to commit to their Stone Age name and wear their totem badges.

3. Hand out EARLY HUMANKIND essay. Reading this essay may take the rest of the period, but it effectively previews Passage I. If your students are older or quite capable, you may want not to read the essay but instead give a mini-lecture based on the essay. In this case, cover the highlights of the human journey, including the "controversial" evidence for evolution and various hominid ancestors. The class should discuss what they have read or you have presented in a lecture.

4. Before moving on to Passage I, you may want to complete at least three tasks:
   a. Establish all due dates for tasks already assigned.
   b. Make sure students are fully aware of their responsibilities during the simulation and how it will be played out over the next several days.
   c. Show a video segment from films listed on pages 14–15. We particularly recommend *Caveman*, a 1981 clunker with Ringo Starr. The first 15–0 minutes have enough information to show students how easily the myth of early humans and dinosaurs co-existing has permeated our culture. Also worth considering is a segment from *The Flintstones*.

Teaching Tip →

Consider having a special place on your front board for key due dates and upcoming activities within BONES & STONES.



BONES & STONES

A simulation of early humans facing challenges of the Stone Age

Student Guide

Sleep. Then light. Dark, light. Dark, light. Your eyes try to adapt as you open them and focus after hours of slumber. You notice the sun's illuminating fingers have just begun to creep inside your cave. Twenty-seven of your band members around you are beginning to stir, but they show no signs of getting up to stoke a dying fire. During this quiet time you ponder—as you often do-where your being is in the scheme of life, the earthly world you can see and the unseen spirit world you can neither see nor understand.

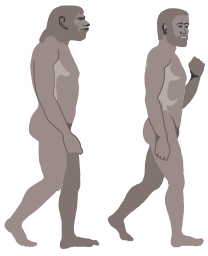
Soon it will be spring when life is always renewed. With that event, you and your band will have mobility again. Animal herds will be numerous enough to supply fresh meat. Edible plant food will be in abundance—seeds, berries, and tubers. The Goo-Bur, your shaman, has told you stories in which your ancestors over time improved human lives so that you could survive into adulthood and pass on to your children an easier and less dangerous life. To be sure, your continued existence is a fortunate reality and certainly better than the other option.

More inert bodies in the cave are beginning to stir. Human noises echo off the dank cave walls. You look around and feel safe from large predators that lurk outside in late winter. Because you're a hunter, fearful thoughts of bear and lion make you reach for your spear and spear-thrower lying next to you. Patting them brings a smile to your weathered face.

Suddenly, your mate throws off her bison robe and slowly rises, a signal that you must start the day in … **the Stone Age**!

Introduction

In the beginning of this simulation, you and your classmates will join prehistoric bands meeting the challenges of Stone Age life. The Stone Ages, when humans mostly used stones as weapons and tools, span a long time period, from *c.* 3 million to *c.* 3,000 years B.P. (Before Present). Along with other Stone Agers, you will take appropriate names like Jadd or Fanta and make a totem badge to wear each day during the simulation. (It will display your name and best personal qualities.) Your band will also devise a salute, handshake, grunt, and banner that—like the individual totem badges—will characterize your small band. Likewise, a member of each band will make a small bag to hold the Survival Stones which the band will earn throughout the simulation's passages after members successfully complete tasks. You will read a fascinating essay about the long journey of the human race from our earliest ancestor, *Australopithecus*, to the modern-like Cro-Magnon people, who lived only about 15,000–10,000 years ago.



Length and goals

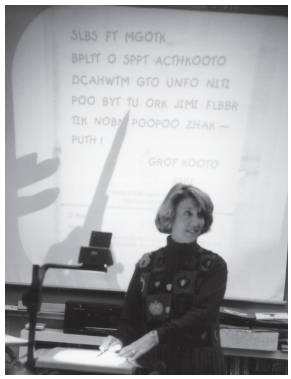
The simulation might last four to five weeks, depending on your teacher's decisions about what to include or omit. Possibly you will complete only portions of the simulation to get a taste of **BONES & STONES**. Hopefully, time will allow you to experience the full version. Besides interacting with other students as you accumulate Survival Stones, you'll learn to appreciate the everyday struggles faced by people before writing was invented and ancient civilizations such as Egypt and Sumer arose along fertile river valleys.

Welcome to the Stone Age

From the start, you must meet and overcome challenges of your Stone Age environment. To do this, prepare to use maximum effort to contribute to your band—and to the larger clan. Cooperation is essential for survival. Do all your work and assume and carry out all your responsibilities. Research, present, then hunt, gather, invent, solve, decide, paint, and construct! **BONES & STONES** will afford you opportunities to prove yourself in a setting that requires clear thinking, cleverness, and hard work—just as modern life requires. For your efforts, most of you will earn an academic degree (a Doctorate in Prehistory from Graystone University) after which a tea will celebrate your achievements. All these accolades are for survivors who have met the challenges in the six Passages described below.

Passage I: Seminar

Your journey starts not in the Stone Age but in a rigorous college seminar setting. Here scholarship and oral speaking skills, not cunning and physical strength, are required. What happens? Small group meetings give you opportunities to explore various topics such as: **What makes human beings *human*?** … **the searches of paleoanthropology and archaeology** … **the theory of evolution and the five major hominid types** which preceded the modern *Homo sapiens sapiens* species to which we belong. Band presentations will "flesh out" these topics and prepare you to enter the Stone Age and meet unforeseen difficulties in your new roles as prehistoric people.



Author Barbara Lacey discusses the importance of gestures and facial expressions in reading ***Gibberish*** *as she motivates her students in a pre-oral language activity.*

Passage II: Survival

Quickly the trappings of your comfortable and familiar modern lives are stripped away. The veneer of civilization disappears. Nevertheless you soon adapt to your surroundings by learning to build a fire from scratch, by throwing a spear, and by playing a clever hunting and gathering game in which identifying the beasts and edible plants around you earns Survival Stones for your band. An essay on hunting, gathering, and adopting a Stone Age Diet deepens your understanding of what is necessary for survival. Guidelines for a personal toolmaking task are also explained.

Passage III: Language

What's it like to be in the company of people who speak a language that differs from your own? Early humans likely utilized grunts, gestures, and a kind of "baby talk" to communicate with one another. Your entire clan reads an essay on how human speech developed, probably from a need to cooperate on the hunt, and to occupy time around blazing fires inside caves on long winter nights. Your band has an opportunity to invent words and phrases, as well as grunts and gestures, as you act out a SCENARIO CARD about Stone Age life and present your scenario to the clan gathering. Clan members try to interpret what they see and hear. This Passage III also includes clan-threatening Cave Court situations that require discussion and decision-making by the entire clan. Guilt and punishment are both addressed.

Passage IIII: Cave Art

Perhaps the most amazing artifacts left by Cro-Magnon people (our most recent ancestors of about 15,000 years ago) are magnificent paintings of animal prey on cave walls. For example, on walls in Altamira, Spain, and Lascaux, France, scenes show bellowing bison, trotting horses, and even mysterious unicorns which all resemble a modern Picasso-style art that amazes us with the artists' techniques and visual impressions. Your band will learn what cave artists did and how they did it before you are given a wall and paint (or chalk) to render specific scenes of a prehistoric hunter's daily life. You perform this task in a dimly-lit "cave," applying the paint with brushes you have fashioned out of natural materials. Afterward, a clan gathering listens to your vivid description and interpretation of your paintings. Finally, a lively interview with a "real" Stone Age family enables you to review the first four passages as well as gauge the accuracy of what many of us have seen on TV or in movies about cave dwellers or early humans.

Passage ~~III~~: Megaliths

Comparing huge stone structures such as stonehenge with our modern-day churches or football stadiums may not be a fair way to judge the feats of our ancestors. Yet the fact remains that the materials for these mysterious stone sentinels were transported and raised into place without the use of modern technology and machinery. Only thousands of workers toiling over hundreds of years could have accomplished what they did. All of you will work to build a replica of England's circles of megaliths called Stonehenge. Using paper-towel tubes you'll move 76 cement bricks from their distant quarries over to the specified building site and then raise stones as pillars and lintel caps to form a class stonehenge. And how do you meet the challenge of lifting and moving the sarsen stones into their mathematically-precise positions in two circles? You must follow rules restricting each of you to use only one hand, twine, and a few lever-like tools.

Passage ~~III~~ I: Conference

You breathe a sigh of relief as you leave the Stone Age and return once more to a university setting. Here you face your "orals," difficult oral exams in which you display, demonstrate, and present the tool you have made. You then review the entire simulation's concepts and data in a College Bowl Quiz Show format before taking "comps" (a comprehension written exam). Finally, those who qualify because they have passed their orals and comps participate in a graduation ceremony and receive their Doctorate of Prehistory from prestigious Graystone University.

Debriefing

Your teacher will guide you through the upcoming Passages of **BONES & STONES**. Needless to say, the accomplishments of Stone Age men and women were impressive, especially when we look at the progress each succeeding hominid band, especially Cro-Magnon people, made over millions of years. So whether you tackle each Passage's separate challenges or do only portions of this simulation, keep in mind your rugged but remarkable Stone Age ancestors and what they gave to us, their descendants.

Nearing completion after the efforts of "thousands" of workers over "centuries," our Stonehenge begins to resemble the majestic monument we see today.

BONES & STONES NAMES

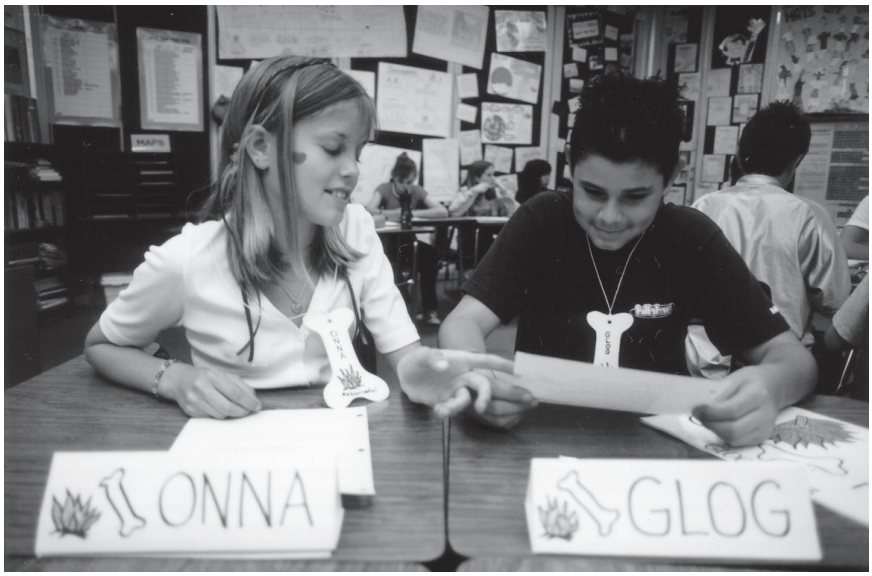
Directions: During BONES & STONES each band member will choose or be assigned to one of these names below. In your class *every clan member must have a different name.* **Note**: If you can back up a choice with logic that convinces your band members, you may choose a name different from any on this list.

Males

Arnor
Ator
Blip
Blob
Brung
Dolt
Flint
Glog
Grogor
Hamst
Heff
Hexor
Jadd
Justor
Kanot
Klix
Klix
Klok
Klorox
Krock
Kronk
Mox
Noxo
Piff
Pilgor
Pillo
Pith
Plop
Pondo
Rox
Skum
Sorg
Tano
Thall
Thog
Wonk

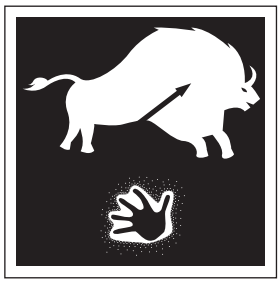
Females

Anna
Bliffa
Breeze
Brook
Cubbi
Deena
Droplet
Ena
Exna
Fanta
Flixi
Gemi
Glowen
Hexy
Lara
Lexus
Libia
Lixia
Moonee
Natra
Neanda
Norfia
Onna
Pillia
Porfi
Radian
Roxy
Subie
Sunno
Swoona
Theena
Tiff
Twink
Warms
Wawah
Wind



Seminarians Onna and Glog, with their totem badges worn around their necks, share an intellectual discovery as they read about ***Homo habilis****, preparing for their presentation.*

CLASS ROSTER



Class period ➤ ☐

Clan Name: *(Circle one)* Cave Lion … Cave Bear … Bison …Eagle … Mammoth … Spirits … Wind …

In prehistoric times, clans consisted of 30-40 persons. Bands were a smaller unit. Several bands made up a clan. *(Clan name and Band name chosen by class vote)*

DIRT BAND Leader: _____

Other members:_____

_____

WATER BAND Leader: _____

Other members:_____

_____

EARTH BAND Leader: _____

Other members:_____

_____

SKY BAND Leader: _____

Other members:_____

_____

ROCK BAND Leader: _____

Other members:_____

_____

FIRE BAND Leader: _____

Other members:_____

_____

WOOD BAND Leader: _____

Other members:_____

_____

SURVIVAL STONES TALLY

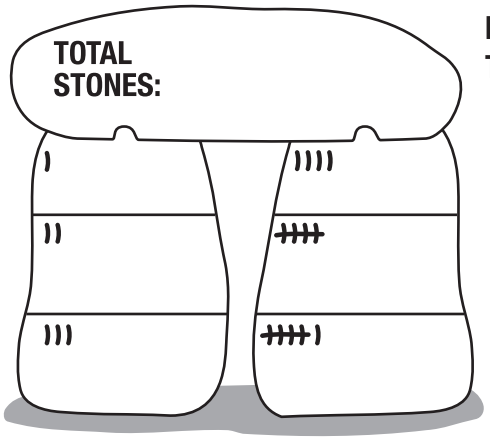
Class period ➤ ☐

Band: _____ Members: _____

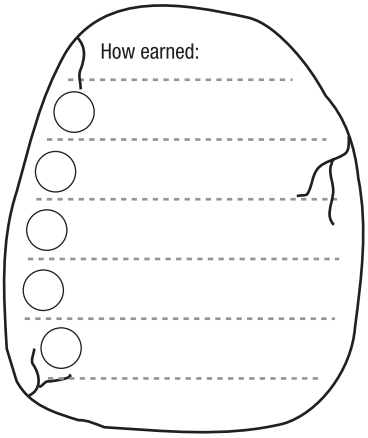
_____

_____

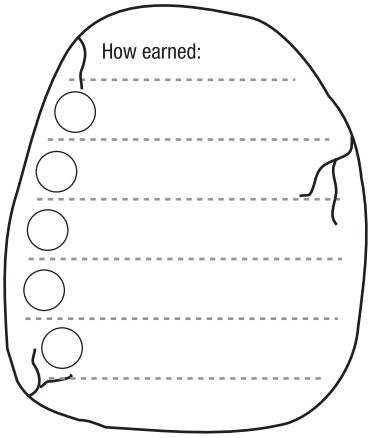
Directions: During BONES & STONES your band will earn Survival Stones as members complete assignments. Enter the number of Survival Stones earned (in the circles) for each assignment in each passage. Then add the number of Survival Stones earned from each passage in the **Passage Totals** megalith. The band earning the most Survival Stones will receive special recognition and awards during the Graduation Ceremony.



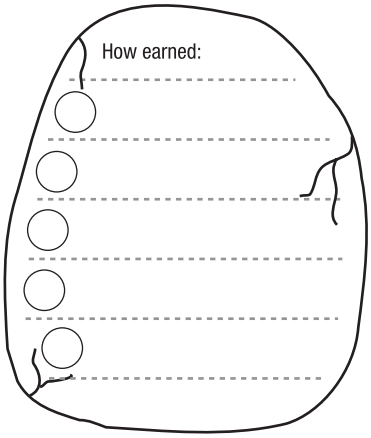
Passage I: Intro/Seminar



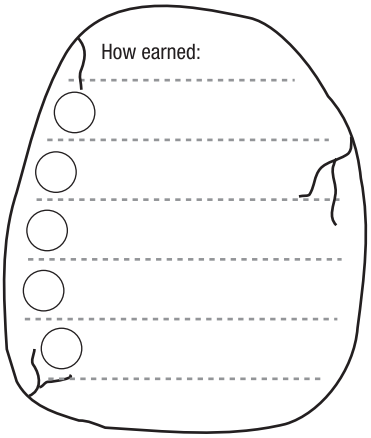
Passage II: Survival



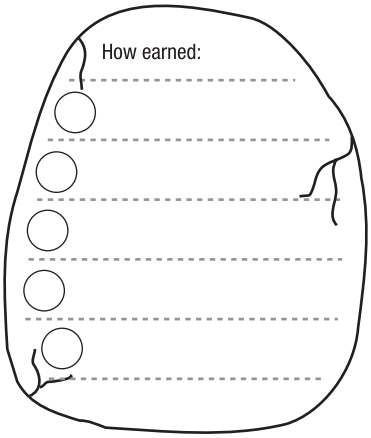
Passage III: Language



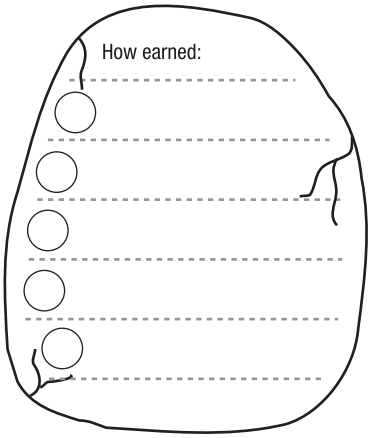
Passage IIII: Cave Art



Passage ~~IIII~~: Megaliths



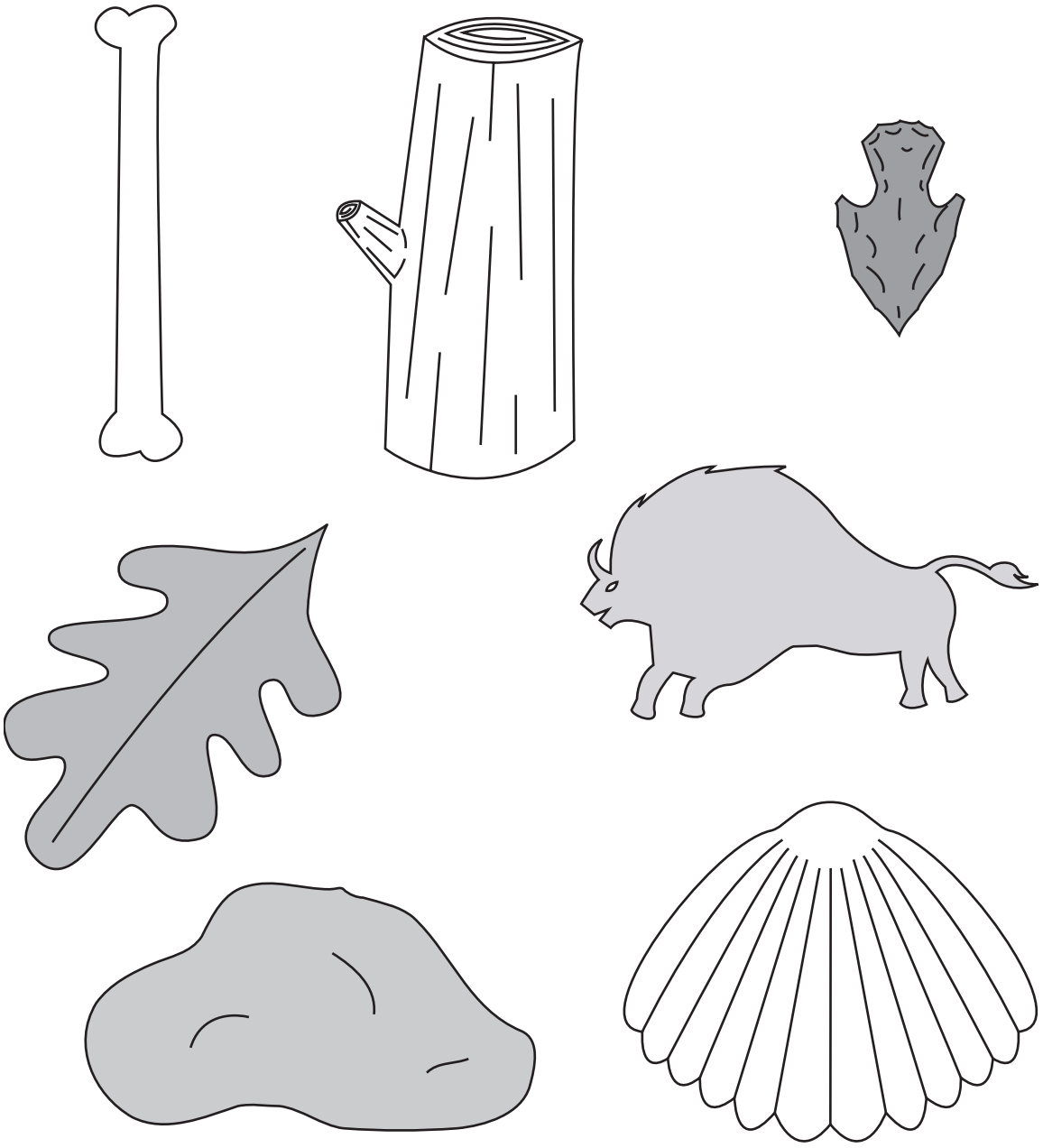
Passage ~~IIII~~ I: Conference



TOTEM BADGES

Directions: A totem is a natural object, especially an animal adopted by Stone Age people to symbolize their family, band, or clan. Today a family crest is a totem, as are the animals sports teams adopt to represent them (e.g., the Michigan *Wolverines* and the Texas *Longhorns*).

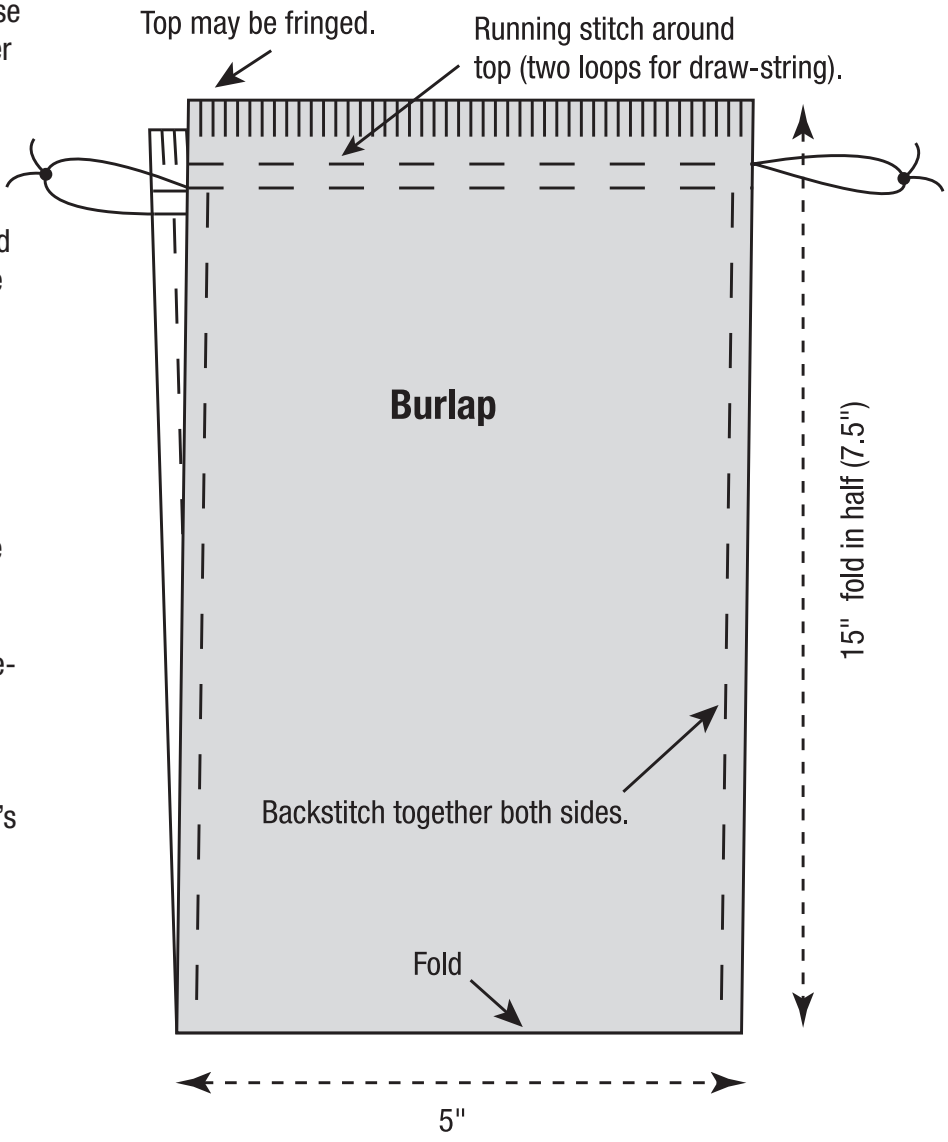
You must now adopt a totem symbol to represent and unify your band. Examples are found below. Your band's name and your symbol should complement one another and make the combination mean more than the separate parts. Once you have made your decision, have one or two of your most artistic members make colorful totems for each member to wear on a piece of twine around the neck or to pin to the front of your shirt. Add your BONES & STONES name as well as your best personal qualities.

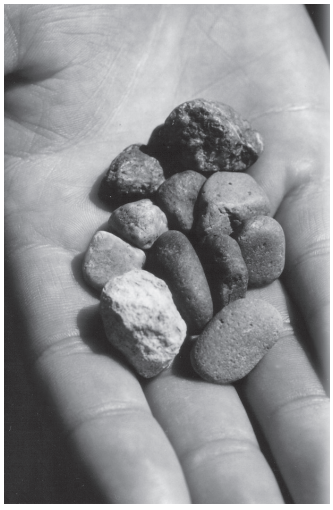


SURVIVAL STONE BAG

Directions: (Modify these directions if your teacher allows you to do so.)

1. Purchase burlap for the bag at a fabric store or craft shop. An option is for band members to provide their own fabric.
2. Make one Survival Stone Bag for each band to hold all earned Survival Stones.
3. Unravel some of the burlap and use it as sewing thread.
4. Use plastic yarn needles and a threader.
5. Use permanent markers (or fabric paint) for your band's name and totem on the bag.





Survival Stones

Survival Stones and Survival Stone Bag

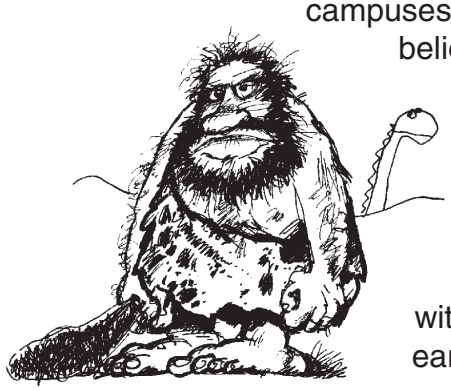
Introduction

You and your classmates are beginning a simulation set in the Stone Age world of prehistory. Once you all join separate bands and give yourself prehistoric names, you will progress through several **BONES & STONES** Passages. And what experiences you will have as you travel some of early humankind's amazing journey. Most of this odyssey will focus on the first "modern" people, Cro-Magnon, who lived during the late Stone Age. As Stone Agers, you'll be asked to go beyond the popular view of movies and cartoons to see how we human beings advanced toward historical times. Now begin your education as a paleoanthropologist and as a prehistoric person by reading this essay.

"… what experiences you will have …"

Cavemen

American moviegoers scared by Steven Spielberg's T-Rex in *Jurassic Park* were also enlightened about the impossibility of dinosaurs and early humans being prehistoric contemporaries. Surveys on college campuses up to the 1990s found even educated adults continuing to believe that the two species co-existed in a primordial world, and that they challenged each other for supremacy as well as for food. No doubt this gross misconception in part has roots in the film inaccuracies of Hollywood films such as *One Million B.C.* and *Caveman*, the latter starring former Beatle Ringo Starr battling large reptiles. In truth, early humans had enough dangers without dealing with dinosaurs. Hopefully, this simulation of early human life will set the record straight.



The "24-hour clock"

In fact, in the space of geological time, dinosaurs died out millions of years before man appeared, only to become oil, man's twentieth century major fuel source. Humans have been around only a few minutes on the earth's "24-hour clock." History, our written record of human experience, comprises only the last few seconds of this clock. The age of computers is only … Well, you get the idea.

"… only a few minutes on the earth's '24-hour clock' …"

Theories

Humankind appears to have a past as murky as its future. To be sure, our origins are imprecise and controversial. Imprecise in the sense that dating fossils of prehistoric humans (hominids) cannot be exact, although each decade seems to bring more accuracy to that effort. Controversial in that most scientists generally agree on one theory of human origins, and some theologians, especially in the U.S., have another theory. Keep in mind that no one knows for sure exactly how and when human originated, despite an ongoing search for more fossils of early humans.

> … believe that humans did not travel through

> an animal chain with an ape or monkey as a common ancestor …

The Bible's book of *Genesis*

Many religious groups in America cling to the version of man's origins as it is written at the beginning of the Bible's Old Testament. Here man is created by God as he is today, a fully formed human being. Certain religious people believe that humans did not travel through an animal chain with an ape or monkey as a common ancestor. Many conservative Christian leaders mostly reject scientific theories about human origin and faithfully accept the Biblical story instead. Certain Christian scholars spend their careers both defending the Biblical account and attacking the theory of evolution. By contrast, the scientific community is largely united in its belief that the Bible should not be used as a textbook of history, geology, or anthropology. Scientists stress that the Bible has no place in schools as a science book. Instead scientists urge that scientific evidence, the scientific method, and rational thought be the vital components used in training young minds to think.

Evolution

As far back as ancient times, most scientists believed that humankind's journey over the millennia has been an undramatic evolutionary journey of slow change from a distant past … to the present … and into the unknown future. With reference to human beings, evolution means that over millions of years people ascended from simple one-celled protozoa in the oceans through a wide range of lower animals, including a common ancestor primate, to the "creatures" whom you call friends and see each day at school.

A conundrum

Humor aside, courtroom juries and school boards across America are often asked to decide cases and issues which revolve around the conundrum of man's origins. (A conundrum is a hard question that is almost impossible to resolve.) This background essay should give a thorough understanding of humankind long journey to Cro-Magnon people, the subject and focus of **BONES & STONES**.

A fossil history

The search for fossils of prehistoric human is the work of archeologists, anthropologists, and paleoanthropologists (sometimes called fossil hunters). The study of anthropology is only about 150 years old. During that time men and women such as Eugene DuBois, Raymond Dart, Louis and Mary Leakey, and, most recently, Donald Johanson with his fortunate discoveries and painstaking analyses of bones and artifacts (man-made articles found with fossils) have pieced together a fossil history of humans. According to these scholars and others, the first hominids (man-like creatures) to be in our "family tree" were the *australopithecines*, an ape-like ancestor, no more than five feet in height who lived in Africa. Extinct at least 4.5 to 5.5 million years ago, *australopithecines* may have looked more like a chimpanzee than modern humans, but they did, according to fossil evidence, walk upright on two legs.

"Lucy"

In the 1970s, anthropologist Donald Johanson, one of the world's most successful (or, lucky) fossil hunters and finders, discovered "Lucy," a full three and one-half foot skeleton belonging to the genus, *Australopithecus afarensis*. "She" was named for a Beatle's song "Lucy in the Sky with Diamonds," which was played over and over in Johanson's camp of ecstatic scientists. "Lucy" was an *australopithecine* who lived about 3 million years ago. She belongs to the oldest group of our prehistoric ancestors.

Homo habilis and Homo erectus

Following the *australopithecines* came *Homo habilis* ("handyman") who perhaps fashioned the first simple tools (e.g., cutting stones) and ate meat. Paleoanthropologists Louis and Mary Leakey, working in Africa's Olduvai Gorge in the late 1950s and early 1960s found and classified *Homo habilis*. This species lived about two to 15 million years ago, stood upright at about five feet tall and had a larger brain capacity than *australopithecines*. *Homo erectus* ("Upright man") follows *habilis* in time, having roamed the Earth about one and one-half million to 300,000 years ago. This species walked upright and was probably the tallest (up to six feet) of modern human ancestors. Being clever, *erectus* was able to use fire, wear clothing, kill large animals, and fashion "tool kits" because it possessed a larger brain than any predecessors. Some *Homo erectus* migrated from Africa to Europe more than 700,000 years ago.

Neanderthal

Sometime between 400,000 and 300,000 years B.P. (Before Present). *Homo erectus* probably evolved into another species called *Homo sapiens* ("wise man"). Similar to *erectus* in many ways, these prehistoric people were the first to inhabit large areas of Europe. One type of Homo sapiens was Neanderthal, the most widely known and widely misunderstood of prehistoric people. Thickset and muscular with protruding faces, large eye brow ridges and no chin, Neanderthals have been characterized as dumb cave men, who, if around today, would make superb NFL linebackers. In fact, they had a brain capacity equal to modern humans; they buried their dead with care; they tended to the sick; and they probably communicated with each other with signals, gestures, and grunts. Perhaps, as recent scholarship suggests, Neanderthals lived at the same time with, but isolated from, Cro-Magnon people, about 30,000 years B.P.

No DNA link

In a six-year landmark study published in 1997, Neanderthal's link to Cro-Magnon was challenged with DNA evidence, indicating that Neanderthals are not an evolutionary precursor of modern humans. Further, they are a separate and genetically distinct species which came to a dead end. This study seems to strengthen the theory that Neanderthal and Cro-Magnons last shared a common ancestor, most likely *Homo erectus*—probably 600,000 years B.P. Nonetheless, Neanderthal's place in the human family tree remains an uncertainty.

Cro-Magnon

Around 1860 when Neanderthal fossils were discovered in Germany and linked to the humans ancestral journey, many were embarrassed. Imagine … modern mankind was related to those ugly brutes! At this same time biologist Charles Darwin published his popular *The Origin of Species*, which explained evolution and pushed the origin of life, and thus mankind, further back in time. Clearly, this was a difficult time for conservative intellectuals and church leaders. But these discoveries were soon made easier to swallow when fossils of an "acceptable" ancestor, *Homo sapiens sapiens* were found in 1868 near cliffs at Les Eyzies, France. Called Cro-Magnon, these prehistoric people were modern in almost every way. At about 5' 6" to 5' 9" Cro-Magnons didn't just look like us. They were us. Compared to earlier ape-like hominids, Cro-Magnons seemed handsome enough to be the "Apollo of Prehistoric Men." One could almost dress them up in today's fashions and watch them fit right in. All people living today are descendants of Cro-Magnons.

First modern people

Between 40,000 and 10,000 years B.P., Cro-Magnons populated the Earth with far-flung settlements in Asia, Africa, Australia, North America, and Europe. Wherever they lived, Cro-Magnon accomplishments are notably impressive. They invented language; they perfected hunting and tool making; they practiced plant-gathering to a point just one step from farming; they lived in large communities in non-cave dwellings; they fashioned elaborate tools, weapons, and implements from bone, ivory, antler, and probably wood; they sewed better and warmer clothing than their ancestors; and they built hotter fires and ate a more varied and healthful diet. Most important, Cro-Magnon people created art and a culture. These ancestors are the artists of prehistory who left magnificent ceiling and wall art in Spanish and French caves.

"

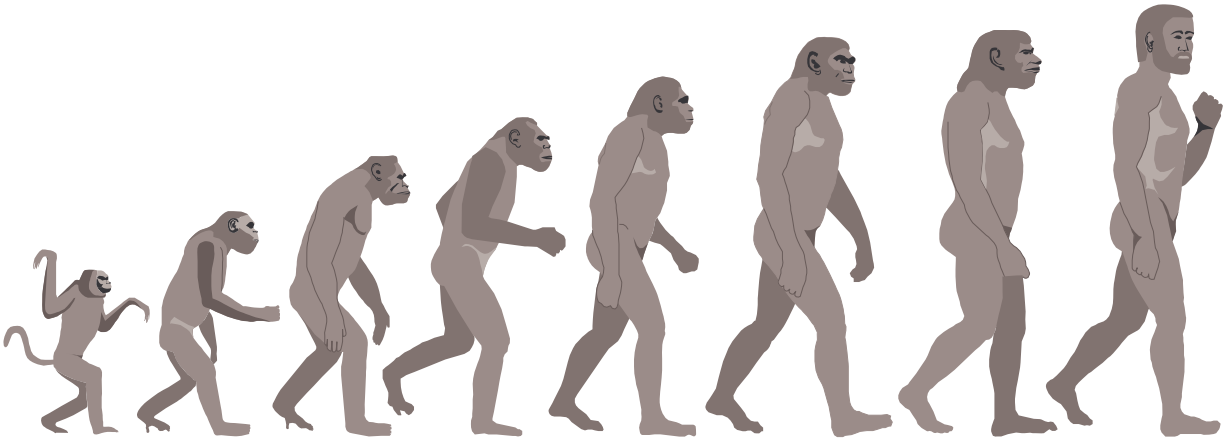
… are descendants of Cro-Magnons …

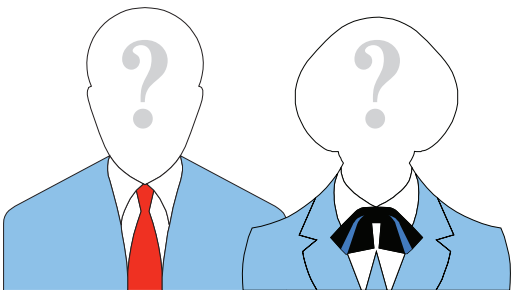
"

With these quantum leaps in culture and technology, humankind reached a stage around 8,000 years B.P. when they were ready to leave a semi-nomadic life and begin to settle in larger communities along rivers, raise animals for food, start farming, invent writing, and, thus, create a civilization. In summary, humankind has progressed through many stages of human evolution starting as far back as 4 million years B.P. *Australopithecus* was followed by *Homo habilis*, *Homo erectus*, *Homo sapiens*, (Neanderthals), and finally *Homo sapiens sapiens*—Cro-Magnon.

Welcome to the Stone Age

Now that you have a background on humankind 's long journey to our closest ancestor, Cro-Magnon, it's time for you to experience aspects of Stone Age life. Prepare to assume roles of paleoanthropologists, hunters and gatherers, toolmakers, language inventors, cave artists, megalith builders, and candidates for a doctoral degree after a prehistorian's conference. ***Think, create, learn!*** As you do, you will compare Fred Flintstone and his Bedrock friends with real hominids. You will ask yourself, **"What makes us human beings? Where have we been? Where are we going?"** Consequently you will gain a greater perspective of the long, slow, human journey we are all living. ***Good luck!***





NOTES

1—Passage I: Seminar

INTRO, FLOURISHES, AND SETUP - 1

> … 'passage' … the process of passing through, a journey …

Purpose

Passage I: Seminar requires about three days. It gives students—not yet Stone Agers—background knowledge, a sort of primer, needed to understand all that follows.

Having been grouped into bands in which they have completed or nearly completed key work (a band banner, totem/logo, folder, Survival Stones Bag, handshake, and greeting grunt, and individual totem badges), students are ready to begin their first Passage. The dictionary defines "**passage**" as the process of passing through, a journey, a way through. Thus, students meet challenges in each Passage and pass through them to meet each new challenge just beyond, much like their prehistoric ancestors did.

Setting

Passage I takes the form of an academic seminar, perhaps in a university setting similar to the one where in Passage ~~III~~ I: Conference, they will take their "orals" and written "comps."

After you, the teacher use display copies to present a necessary perspective, students working within their bands read background information and then prepare brief presentations on one of seven vital topics.

Seven seminar topics

The dictionary defines "seminar" as: "A small class for advanced discussion and research."

1. Scientists who study prehistoric humans
2. The theory of evolution
3. The Hominid Family: *Australopithecus*
4. The Hominid Family: *Homo habilis*
5. The Hominid Family: *Homo erectus*
6. The Hominid Family: *Homo neanderthalensis*
7. The Hominid Family: *Homo sapiens sapiens*

Flourishes

Teaching tip →

Keep students aware of deadlines to complete totems, logos, Survival Stones Bags, totem badges, etc.

Set a tone … "Good morning (afternoon), ladies and gentlemen. Today …"

1. Put the band logos, hand shakes, badges, etc. on hold during this passage and focus on anything that seems collegiate: lots of books, classical music, students wearing glasses, etc.

2. Have all students call each other "Mr." … "Mrs." … or … "Ms." … and their last names. Model this addressing of one another at the start of the passage as you introduce the activities scheduled. The goal of all these suggested flourishes is *to set a serious, academic tone.*

3. Perhaps you could paint or print a large banner—*Graystone University*—and hang it in an obvious place. You could also use this banner in Passage ~~III~~ I: Conference.

4. Arrange for a lectern or podium, projector, and easel to be in your classroom for student use during the Seminar presentations.

Materials

- Butcher paper or poster board—*enough for each band*
- Colored markers—*enough for each band*
- Resources (books, pictures of early humans, etc.)
- Paper strips numbered 1 to 7

Duplication

Duplicate the following **Master Pages** (type and quantity in *italics*):

- 4.5 BILLION YEARS OF HISTORY—*display copy*
- HOMINID FAMILY TAXONOMY—*display copy*
- THE HUMAN JOURNEY FROM "LUCY"—*display copy*
- WHAT MAKES HUMAN BEINGS HUMAN?—*display copy*
- THE STONE AGES—*display copy*
- GUIDELINES FOR PRESENTATIONS—*class set or one to two per band*
- SEMINAR 1—*two to three for one band*
  (Scientists Who Study Prehistoric Humans)
- SEMINAR 2—*two to three for one band*
  (The Theory of Evolution)
- SEMINAR 3—*two to three for one band*
  (The Hominid Family: *Australopithecus)*
- SEMINAR 4—*two to three for one band*
  (The Hominid Family: *Homo habilis)*
- SEMINAR 5—*two to three for one band*
  (The Hominid Family: *Homo erectus)*
- SEMINAR 6—*two to three for one band*
  (The Hominid Family: *Homo neanderthalensis)*
- SEMINAR 7—*two to three for one band*
  (The Hominid Family: *Homo sapiens sapiens*—Cro-Magnon)
- NOTE-TAKING/NOTE-MAKING MODEL—*display copy*
- PRESENTATIONS: NOTE TAKING AND NOTE MAKING—*class set or display copy*

DAY 1: SEMINAR INTRODUCTION AND PRESENTATION PLANNING

1. Before you start Passage I: Seminar, make sure your students are fully aware of due dates for band assignments (e.g. banners, totem/logos, totem badges, etc.). Since this Passage doesn't require the trappings of Stone Age life, these band identifiers aren't necessary until the beginning of the Passage II: Survival. In addition, clarify that student bands earn Survival Stones: by working on tasks attached to challenges facing them starting in Passage I: Seminar!

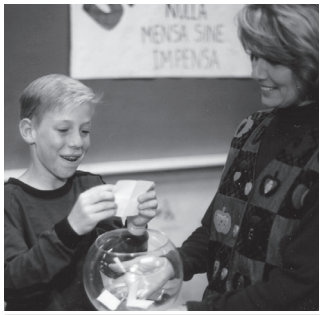
Teaching Tip

You may want to extend the time spent on presenting the display copies by spreading them out over two to three days. This would also give students more time to research and prepare their presentations.

2. Your room should now be ideally arranged to accommodate the seven seminar groups needed for the seven topics of the Seminar format. (If your class size does not allow this ideal circumstance, you will have to make modifications of assignments, etc.) Condition your students to enter the room, go to their bands' area, prepare to listen to your instructions, and then go to work.

3. Begin this Passage by defining a college seminar: a group of supervised students doing research on common topics. Give examples of your personal college seminar experiences.

4. Have one student from each band come forward and take a number (1 to 7) from a hat or box. Based on these numbers, each band will receive two to three copies of the numbered Seminar topics. (The group picking #1 receives SEMINAR 1, (Scientists Who Study Prehistoric Humans); #4 receives SEMINAR 4 (Hominid: *Homo habilis*, etc.)



Ator is joyous upon selecting Homo erectus as his group's seminar topic in Passage I.

5. Hand out to each student or band the GUIDELINES FOR PRESENTATIONS. Slowly go over this entire handout, clarifying points and answering questions as necessary.

6. Students are now ready to get a perspective on their Seminar subject, to get, as it were, the "Big Picture." Show the following display copies *in the order below*. Thoroughly explain each display copy's contents. Part of your presentation with these display copies will include clarifications or direct answers to issues the materials raise.
   a. 4.5 BILLION YEARS OF HISTORY
   b. HOMINID FAMILY TAXONOMY
   c. THE HUMAN JOURNEY FROM "LUCY"
   d. WHAT MAKES HUMAN BEINGS HUMAN?**
   e. THE STONE AGES

   ****Note:** This display copy requires students to complete a pre-activity before you uncover Dr. Sagan's list and lead a class discussion based on the students' and Dr. Sagan's lists.

7. Now that students have the proper perspective, allow bands to read their Seminar topics, and design their presentations.

8. Have available butcher paper or poster board and markers to help members visually communicate the essence of their topics.

9. Monitor the progress of each band's planning. You may want to require that you look at and authorize by signing off on their presentation plans before passing out supplies.

Days 2–3: Seminar Preparation and Presentation

Seminarians Onna and Glog share an intellectual discovery as they read about Homo habilis, preparing for their presentation.

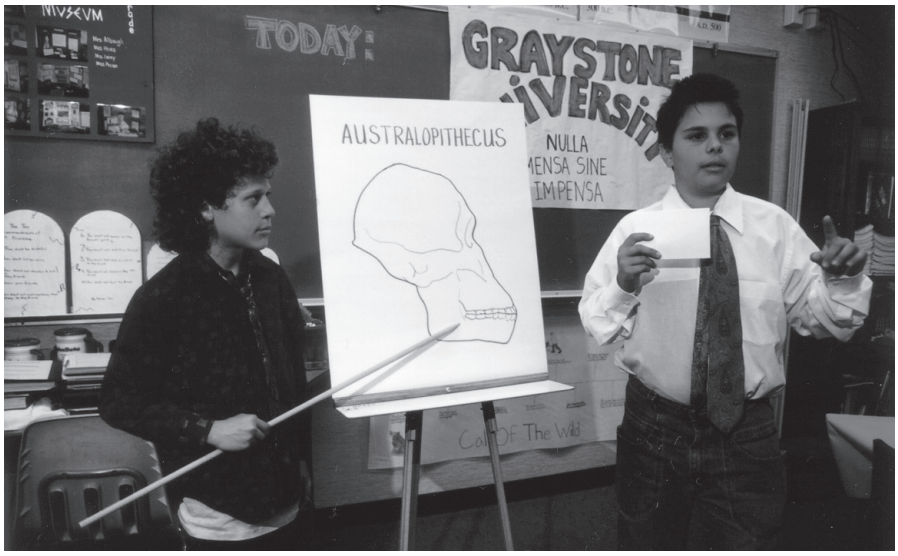
1. Allow students to continue presentation planning. By mid-period of Day 2 some bands should be ready to present their banners, posters, and oral presentations.

2. When you sense all groups have finished, tell students, "The topics will be more easily understood if we go in order, topics 1 to 7."

3. Before the first presentation, display the SEMINAR NOTE-TAKING/NOTE-MAKING MODEL and walk your students through the steps of this method of taking notes. Make clear the difference between their "note-taking" (new information) and "note-making" (making personal meaning from notes taken). Distribute SEMINAR NOTE-TAKING/NOTE-MAKING or assign students to make notes on their own paper, using the form given on the model, as the oral presentations are given.

4. Start the presentations. Allow eight to 10 minutes per band. Intercede as needed, clarifying and asking questions. Explain that you are allotting a total of 100 Survival Stones spread among all bands, which means that the band that does the best overall job in presenting may earn the lion's share of the 100—possibly 35 to 40 Survival Stones. Another group may earn 20, another 10, etc. Hopefully, this explanation will give each band a last minute impetus to do well.

Taking on the responsibility of their portion of the Earth Band's presentation, Plop and Pondo excite other Seminarians about the 500 cc brain capacity of Australopithecus.



5. As the presentations are given, ensure that each band teaches and that the rest of the students learn. The note-taking will certainly help. Afterward, check for understanding by going over the key ideas and points each presentation has made.

6. Collect students' SEMINAR NOTE-TAKING/NOTE-MAKING sheets.

7. Finally, decide which groups get what share of the 100 total Survival Stones and formally award them to the various bands. Ensure that each band's Survival Stones are carefully stored in its Survival Stones Bag.

8. Before concluding Passage I: Seminar, ensure that bands have their banners, totem/logos, folders, handshake, greeting grunt, and totem badges ready for Passage II: Survival, which officially begins with the next class period.

Teaching tip →

Try to include these demonstrations. Both allow students to see how difficult it was to start a simple fire, or to bring down an animal for lunch. We moderns take these activities for granted.

9. If you plan to have students demonstrate fire-making and spear-throwing in Passage II: Survival, do the following:
   a. You may have a few Boy Scouts or Girl Scouts in class who, if not experts on wilderness skills, are at least familiar with the process of fire-making and will volunteer to conduct the demonstrations.
   b. Hand out to volunteers the FIRE DEMONSTRATION (Making a Fire Without Matches) and SPEAR DEMONSTRATION (Making and Demonstrating a Spear-Thrower). Get these materials into your volunteers' hands at least three to four days before Passage II is scheduled to begin (over a weekend is ideal).
   c. Most important of all, check with school district authorities on your liability if you allow these somewhat dangerous activities to take place on your campus. A safer route would be for *you* to design, make, and then demonstrate both fire-making and spear-throwing skills.
   d. The fire-making demonstration is suggested for just after the HUNTING AND GATHERING background essay, and the spear-throwing demonstration after the PREHISTORIC TOOLMAKING background essay.

4.5 Billion Years of History

Condensed to one calendar year

Current time: **Dec. 31** 11:59:59 p.m.

Jan. 1 ..... The Earth is created!
12:00 a.m. (we're not sure how)

Jan. to **July** ..... The Earth's atmosphere is unbreathable

by **Oct. 31** ..... Microscopic organisms appear

Nov. 15 ..... Fish and water creatures appear

Nov. 22 ..... Plants start growing on land

by **Dec. 1** ..... Insects, amphibians, forests, and reptiles arrive

Dec. 15 ..... Dinosaurs dominate the land, sky, and seas

Dec. 16 ..... Mammals appear

Dec. 26 ..... Dinosaurs suddenly disappear

Dec. 28 ..... The first apes arrive

Dec. 31 ..... Australopithecines appear
6:00 a.m. (the first hominids)

Dec. 31 ..... *Homo sapiens sapiens* appear
11:51 p.m. (early modern humans)

Dec. 31 ..... Humans start farming
11:58 p.m.

Dec. 31 ..... Humans build the first city
11:59:40 p.m.

Dec. 31 ..... American patriots sign the
11:59:57.5 p.m. Declaration of Independence

Hominid Family Taxonomy

Paleoanthropologists have grouped our human ancestors into the Genera and Species groups below. This and the HUMAN JOURNEY FROM "LUCY" chart should help you sort out the connections within the Hominid family.

Family Hominidae

Genus *Australopithecus* (the first hominid)

Species *Australopithecus afarensis* (Lucy)
Australopithecus africanus
Australopithecus robustus
Australopithecus boisei

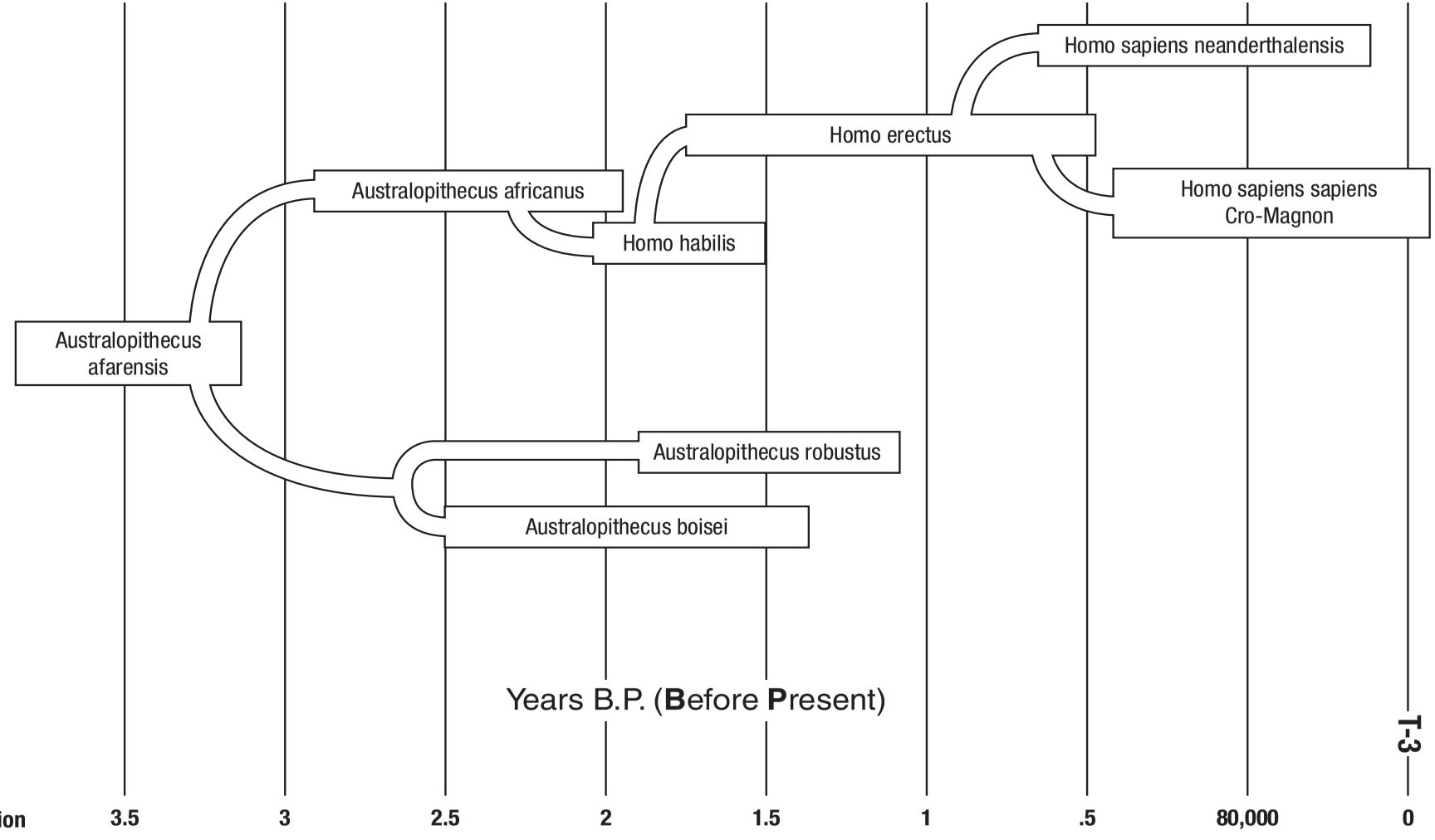
Genus *Homo*

Species *Homo habilis*
Homo erectus
Homo sapiens

Subspecies archaic *Homo sapiens*
Homo neanderthalensis
Homo sapiens sapiens

THE HUMAN JOURNEY FROM "LUCY"

The chart is from the TIME Magazine cover story "How Man Began" (March 14, 1994) pp. 82–83. One change reflects research since then. DNA tests reveal that Neanderthals are no longer considered an ancestor of modern humans, but a separate species which died out about 30,000 years B.P.



HUMAN JOURNEY FROM "LUCY"

What Makes Human Beings Human?

You and your friends probably don't think about and discuss very often how human beings and other animals differ. Scientists, philosophers, and theologians, however, often do ask how we differ from other animals. Dr. Carl Sagan thought deeply about this question and created a list of characteristics considered uniquely human. Make your own list of what you think makes human beings unique. Compare your ideas with those of other students and with Dr. Sagan's list. ***Good luck!***

DO NOT SHOW STUDENTS THE LIST BELOW UNTIL AFTER DISCUSSION

Carl Sagan's List

1. Humans are bipedal. Their hands are free to manipulate.
2. Humans have emotions.
3. Humans perform creative acts.
4. Humans perform rituals.
5. Humans write.
6. Humans have the ability to throw projectiles accurately.
7. Humans are able to perform tasks which require concentration.
8. Humans have gestural language and superior linguistic skills.
9. Humans have a sense of control, of optimism in dealing with events.
10. Humans have analytical abilities and the curiosity and urge to solve problems.
11. Humans anticipate the future and pay the price of anxiety for thinking about what is yet to come, over which they lack complete control. Above all, they know they are going to die.
12. Humans have the ability to think of catastrophe in advance and take steps to avoid it.
13. Humans wonder about themselves and ask these ultimate questions: Who created this world? Why am I here? Who exactly am I? Where am I going?

The Stone Ages

Age of the Dinosaurs — ***200 million to 100 million years B.P.**** *(**Note**: Not even close to humans in time!)*

The Old Stone Age (aka: Paleolithic period) — ***c. 2.5 million to c. 10,000 years B.P.***

Characterized by:

- *Hunting and Gathering*
- *Hominids Australopithecus through Homo neanderthalensis and early Homo sapiens sapiens*
- *Development of tools from flake tools to cleavers, axes and burins (working with stone, antler and bone)*
- *Gradual mastery of fire and development of oral language*

Middle Stone Age (aka: Mesolithic period) — ***10,000 to 8,300 years B.P.***

Characterized by:

- *Hunting and Gathering*
- *Fishing and harvesting aquatic foods with fish hooks, harpoons, and canoes*
- *Hominid dominance by Homo sapien sapiens (Cro-Magnon)*
- *Refinement of oral language skills*
- *Cultural/social achievements (cave art, music, burial of the dead)*

The New Stone Age** (aka: Neolithic period) — ***8,000 to 3,500 years B.P.***

Characterized by:

- *Sophisticated oral language skills*
- *Continued existence of Homo sapien sapiens (by now all other hominid types are extinct)*
- *Domestication of animals & grains*
- *Man-made shelters & hand sewn clothes*
- *Construction of stone structures (e.g. Stonehenge)*

Next Up: *The Copper, Bronze, and Iron Ages, in which humans develop civilization: writing, political organization and law, arts and sciences, urban life, social classes, and labor specialization.*

Notes: **** B.P.** = **B**efore **P**resent*

******* These dates vary in different regions of the world*

Guidelines for Presentations

Motivation

All well-organized classes, in schools at all levels or universities, have a core of knowledge that students must understand. The Seminar presentations in Passage I are the particular activity that will serve as the knowledge base for **BONES & STONES** and for the exams facing you in your "orals" and written "comps" in Passage ~~III~~ I: Conference. At that time you will be tested on material from all passages, and Passage I sets up the background and framework. Therefore, take your upcoming Seminar presentations seriously.

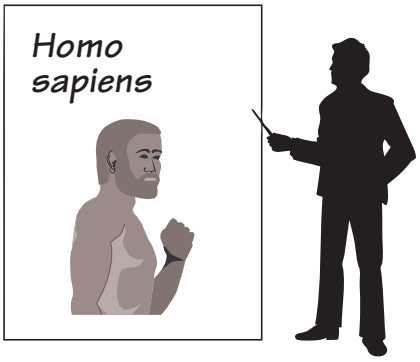
Your band will at some time in this Passage present to other seminarians the specific material found in your selected background information essay. Each separate band will earn a grade, which will be converted at the end of Passage I to Survival Stones.

Suggestions

Here are suggestions on how to make your presentations effective, interesting, and worthwhile.

> "… brainstorm for any technique that you think will help teach …"

1. **Be vivid**. Use visuals to enhance and vivify your presentation. Consider using lots of color, pictures, graphics, drawings, poetry, metaphors or similes, T-charts, flowcharts, and Venn diagrams. In fact, your band should brainstorm for any technique that you think will help teach the rest of your colleagues. If your teacher gives your band a banner-sized piece of butcher paper or a large piece of poster board, make use of it. Splash on it the essence of information from your handout!



2. **Involve everyone in your band**. In your presentation, everyone must present at least some information. One in the band may lead the presentation, but somewhere in the time allotted for your topic, each band member must orally participate. *Do not overlook the unique contribution that each of you can make.*

3. **Focus on impact**. In your preparation, read the background essay carefully. What ideas and information "leap off" the page because they are very interesting or extremely important? Organize who will "teach" which segment.

Guidelines for Presentations

> "Youth is a cup without a handle."

4. **Create *pithy comments***. Since listeners will be taking notes—writing down important facts or statements—during each band's presentation, help one another so that each band member composes at least one *pithy comment.* Such a comment is one a listener remembers because it is terse, full of meaning, provocative, and possibly poetic. When you hear a *pithy comment*, you say to yourself, "Wow! What was just said may be important for me to know!" Here is an example of a dull comment an older person made when speaking about teen agers: "Kids today are so young and helpless. They don't really know how to do anything." Now read this *pithy comment* about teenagers: "Youth is a cup without a handle." Hmmmm. Why does it make you pause? Talk over this last statement within your band. Suddenly you'll understand what *pithy* means.

5. **Be confident and enthusiastic**. When you present, strut your stuff. Speak loudly, with authority. Refer to your portion of the visuals or information displayed and relate your portion to what's already been presented and what's still to be presented. And, when you speak your *pithy comment*, pause dramatically and then shoot it at your audience like a well-aimed arrow.

6. **Expect questions … and ask questions**. College seminars seek *veritas*, a Latin word for truthful knowledge. If your presentation is interesting, your classmates will ask questions. If your presentation is boring, your listeners will be sitting there with dulled eyes, staring off in space. To prepare yourselves to answer questions, members of your band should role play fellow classmates asking questions of each presenter in your band. Practice answering these questions so that you bring out what is essential for everyone to know about the material you present. One way to learn more is to help a presenter clarify some hard to understand materials. Simply ask the presenter a question such as this: "Bob, what you're saying seems to be that …" Then you put what *you* think he's saying into your own words; however, lead *him* to clarify your question with the extra knowledge and understanding he gained during his research. The result? He'll be a better presenter, and everyone will have learned more.

Scientists who study Prehistoric Humans

Your responsibilities

As an eager, intelligent archaeology and anthropology student, you must work diligently during this Seminar Passage to learn more about the essentials of physical anthropology before moving on through this simulation. Here are your specific responsibilities:

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Can you locate your femur and mandible?

Femurs and mandibles

Imagine the knowledge and skill needed to be a scientist, especially those gifted men and women who study our earliest ancestors. Since the mid-nineteenth century, professionals in this and related fields have worked hard to uncover the human past, one inch of rock and a tablespoon of dirt at a time. This process is laborious and painstaking, often done with small paint brushes, calipers, trowels, dentists' picks, and screen sifters to expose a prehistoric femur or mandible, the fossils humankind has left dating from 2 million to 3 million years **B.P.** (**B**efore **P**resent) when the hominid family first appeared.

"… search for the artifacts

humans left behind …"

Archaeology

For the most part, fossil hunting—the searching, discovering, piecing together, and cataloging of bones, tools, and utensils of prehistoric humans—is a team effort. It involves several different kinds of scientists with specialties in prehistory. Archaeologists search for the artifacts humans left behind; they use this evidence to explain how early humans lived. For example, if a team of archaeologists finds the bones of certain animals along with pottery shards at a site where people built fires, they might conclude that these particular humans ate these creatures and used pottery in some way related to food. Pottery may also tell archaeologists how sophisticated or advanced these people were.

Long days

At the same time, archaeologists seek out the expertise and opinions of geologists, botanists, and paleontologists; the latter of whom deal with prehistoric fossils of all kinds. Archaeologists' work involves long years of university training, on-the-site experience, careful record-keeping, and the patience and endurance to spend long days under a blazing sun excavating in remote areas to uncover fragments of fossils with a dentist's pick.

Scientists who study Prehistoric Humans

"

… who slowly piece together

bones and construct the story …

"

"Stars"

As you might expect, most archaeologists toil in anonymity; that is, few achieve fame or wealth for their work. Most often, the men and women who choose archaeology are college professors. They use grant or private foundation money to go on digs in isolated spots around the globe. Some individuals, however, have become "stars" of this profession. Champollion, Petrie and later Howard Carter are "stars" in Egyptology. Similar fame came to Henry Rawlinson for Mesopotamia, Arthur Evans for Minoan civilization, Leonard Wooley for Sumer and Akkad, and Heinrich Schliemann for Troy and early Greece.

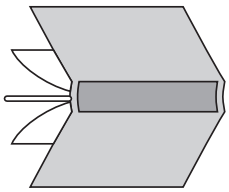
Anthropology

With regularity, archaeologists also study anthropology in college. Anthropology is a science that studies man (humans). Physical anthropologists focus on the search for fossilized human bones; cultural anthropologists study primitive people living today. Recently, those who study our ancestors' many, many fossils have begun calling themselves paleoanthro-pologists. These are scientists who slowly piece together fragments of bones and construct the story of how early humans learned to walk upright, use their hands, and how their brains grew in size to increase intelligence.

Dramatic discoveries

Like archaeology, the science of anthropology requires patience and endurance. While there have been a few spectacular anthropological finds in the twentieth century, most people in the field plug away at this work they love, hoping to advance their profession rather than their careers. Nevertheless, some anthropologists have made dramatic discoveries of fossilized human skulls and bones. People such as Raymond Dart, Eugene DuBois, Louis and Mary Leakey, Richard Leakey, and most recently, Donald Johanson, have sparked public interest in physical anthropology. Because of these scientists and their newsworthy discoveries, magazines, newspapers, and even television are presenting stories on anthropology as well as reporting on annual conferences. Thus, these spectacular discoveries have made anthropology a more familiar subject.

Charles Darwin's *Origin of Species*



The Theory of Evolution

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Evolution

The word *evolution* means slow, orderly change. For example, children evolve into adults, and horseless carriages evolved into modern automobiles. For our purposes in **BONES & STONES**, evolution means humankind slowly changed, or evolved, from one-celled ocean creatures millions of years ago through a chain of higher animals to the mammals they have become over the last 2 million to 3 million years. The actual theory of man's evolution, that is, a written or spoken explanation of human origins, was probably first suggested by the ancient Greeks. During more modern times, Erasmus, Darwin, and Comte de Buffon in the 18th century and later Jean Baptiste de Lamarck, attempted to observe and explain the similarities between and the changes in plants and animals. With the exception of Darwin, these scientists had little overall effect on scholarship, and their ideas proved to be inaccurate.

Charles Darwin

The modern interpretation of the theory of evolution dates from the book *The Origin of Species* (1859) written by English naturalist Charles Darwin. In it, Darwin tried to prove that the idea of man's special creation was untenable (cannot be defended under attack) and that only evolution explained the wide diversity of living things on our planet. Further, Darwin's "theory of natural selection," the mechanism of evolution, has functioned without consideration of a Supreme Being, or a divine creator. Darwin's book popularized the theory of evolution, natural selection, and the term "survival of the fittest." It also stimulated scholarship to prove right or wrong his beliefs.

The Theory of Evolution

A firestorm

Darwin's particular contribution was to possess the patience and observation of a brilliant naturalist and to have the courage to face his critics' "slings and arrows." Most of his Victorian contemporaries believed the idea of man's special Divine Creation. For a man such as Darwin, who did not invent the controversial theory but demonstrated the mechanics by which it could have operated, this reaction was a firestorm of dissent. The British middle class felt his theory was an outrage; they considered it a clear assault on the revered presentation of man's origin in the Bible's book of *Genesis*. At the same time many people around the world misunderstood Darwin, and mistakenly believed that he was saying that human beings had apes as ancestors.

The scientific method

Most religious people base their beliefs on faith, that is, they accept what is and what was without proof or evidence. Most scientists such as Charles Darwin, however, work under a different credo. They use the scientific method to validate, verify, or prove what is, what was, as well as the why and the how. Briefly, the scientific method utilizes the steps of identifying a problem, coming up with an educated guess (hypothesizing) for a solution or answer, conducting experiments, observing results, taking notes, and finally, drawing conclusions.

The evidence for evolution

For some of you, using the theory of evolution to explain human origins may clash with your religious beliefs. Reading this and participating in **BONES & STONES** will not destroy your particular faith; this simulation experience merely presents to you the conclusions most scientists believe after more than a century of intense application of the scientific method. Essentially, these particular points constitute documentation or evidence for evolution:

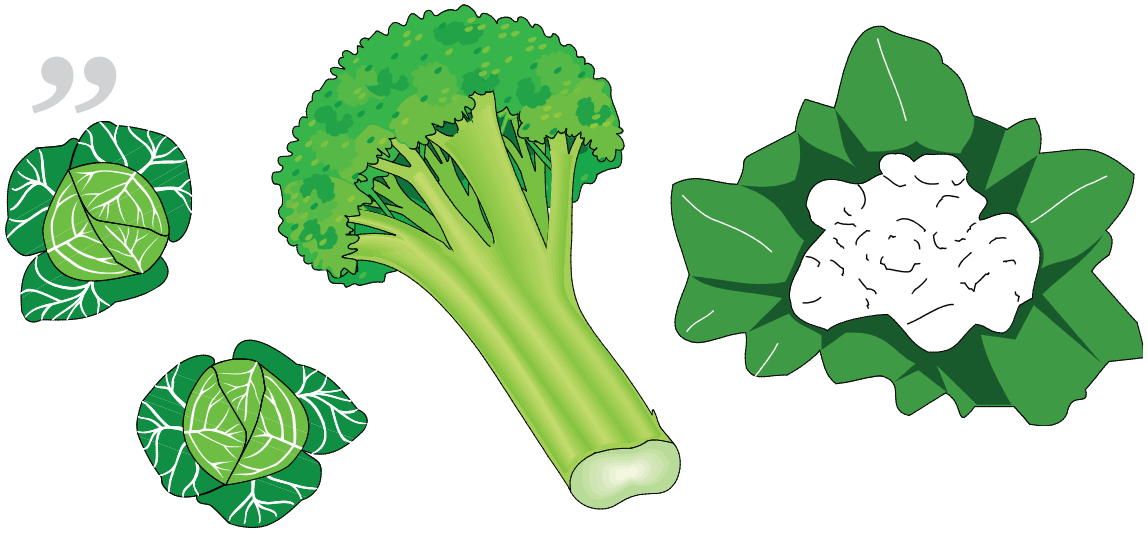
> "… from one-celled organisms to complex animals …"

1. **The fossil record**
   Paleontologists have ample fossils found in geologic strata to explain much of the history of life on Earth. It shows a progression of life from one-celled organisms to complex animals living today.
2. **Geographic distribution of species**
   The Galapagos Islands, for example, have no native mammals, only those animals which travel easily over stretches of water from large continents. Oceanic islands such as the Galapagos lack major types of animals and plants that live elsewhere. The many species of finches there, for example, support the idea that a limited number of finches came to the islands from the South American mainland and then evolved into new species.

The Theory of Evolution

3. **Embryology**
   The study of embryos shows the similarities of most animals as they develop in the womb. Particular processes during these stages can be explained only by evolution of the organism from another species.
4. **Vestigial organs**
   By looking at organs that no longer have a purpose or function, scientists can make a further case for evolution. Many whales have tiny legs that are vestigial, useless remains of some land-dwelling ancestor. Cave bats have eyes but are blind. Finally, humans have a useless appendix, but most apes have a fully functioning appendix that helps digest fibrous plant food.
5. **Evolution in today's world**
   Traditionally, evolution is seen as taking millions of years, but today environmental changes from human "disturbance" can illustrate evolution. For example, industrial soot and pollution can kill species of plants and change the color of moths. Because light-colored moths blend in with light-colored plants, predatory birds will eat only those moths they can see, ones who have become black from soot.
6. **Artificial selection**
   Breeders of animals and plants can artificially change species to enhance or continue desired characteristics, often with fast and dramatic effects. Broccoli, brussels sprouts, and cauliflower were selectively bred from one single species to develop different specific taste and texture qualities.

"… can artificially change species to enhance or continue …"



The Theory of Evolution

The Scopes 'Monkey' Trial

"… that God miraculously created the basic forms of life …"

Critics of evolution

1. **Evil-ution**

   As mentioned earlier, the theory of evolution has not satisfied everyone, despite the fact that nearly all scientists accept it. Like Europeans in Darwin's time, many Americans have rejected the explanation of evolution. In the 1920s, some states banned the teaching of evolution (opponents pronounced it "Evil-ution") in public school classrooms. One famous court case, the Scopes 'Monkey' Trial, brought nationwide attention to the ongoing battle. In 1968, the U.S. Supreme Court ruled that these restrictive laws were unconstitutional. Since then, people who generally oppose evolution point to what they consider gaps, weaknesses, and errors in the theory. These people favor the Bible's narrative of man's Divine origin and call themselves creationists or creation scientists. They stress that God miraculously created the basic forms of life, an accepted belief of virtually everyone before Darwin's impact. In the early 1970s, the Institute for Creation Research (ICR) was organized near San Diego, California. The ICR hoped to advance the creationist agenda, which included, among many items, getting equal time for creationist theory in public school science classrooms. Up to 1998, the courts have invalidated the ICR's attempts.

2. **God's "Blue-Print?"**

   Creation scientists claim that the theory of evolution is far from a proven fact. They state that the use of embryology and comparative anatomy as proof of evolution merely obscures the possibility that the Creator used the same "blue-print" for all living things. Obviously, the intellectual arguments over the theory of evolution will continue to generate heated debates.

Hominid: *Australopithecus*

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What does this name mean?

"Hominid" refers to a member of the scientific Family that includes human beings and prehistoric human-like creatures. The genus Australopithecus includes several human-like species who are referred to as australopithecines. The name means "southern apes."

What is their chronological order in the Hominid Family?

Australopithecines are regarded by most anthropologists as the earliest group of human-like creatures. They are considered our first prehuman ancestors.

When and where did they live?

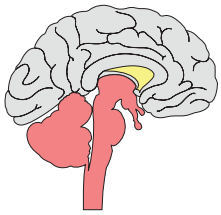
Australopithecines lived about 5 million to 1 million years **B.P.** (**B**efore **P**resent). They became extinct about the same time the first humans appeared. Fossil remains of Australopithecus have been found in eastern and southern Africa.

"… nicknamed her 'Lucy' after a popular Beatles song."

Who are the fossil-hunters of these hominids?

Two anthropologists have been very successful in unearthing fossil remains of australopithecines. In 1924 Raymond Dart, a South African, discovered a child's skull at Taung, South Africa. He named the creature Australopithecus africanus. Fifty years later (1974), researchers led by Donald Johanson found 52 separate bones of a female human-like skeleton in Ethiopia. His team nicknamed her "Lucy" after a popular Beatles song. Since this discovery was classified as a different species than Dart's discovery, it was named Australopithecus afarensis. Four years later human-like footprints were found in Tanzania, Africa. A few years later a lower jaw bone and skull fragments were unearthed in Kenya. Two other australopithecines, A. robustus and A. boisei, have been discovered, but both seem to be "experimental" lines of the genus that evolved alongside the human genus before dying out.

Hominid: *Australopithecus*



What was their brain size?

The brain size of all animals has much to do with intellectual capacity and thinking. From fossil evidence, australopithecines had a brain size of about 450 to 500 cc. in volume, larger than gorillas but smaller than modern humans (*c.*1400 cc.) These numbers mean that australopithecines, in brain-to-body ratio, are midway between apes and humans.

What did they look like?

Australopithecines probably resembled chimpanzees more than humans. However, an important human quality they did possess was standing upright (orthograde, not ape-like pronograde) and walking on two limbs (bipedalism) instead of four. Australopithecines had large faces that jutted out, with smaller, flat teeth suitable for grinding food. Further, they probably had less body hair/fur than primates. Finally, the average australopithecine had long arms, weighed about 70 pounds and was 4 feet 5 inches tall.

What made them human-like?

The fact that australopithecines walked upright on two legs is a significant step toward humanness. Another human quality they seemed to possess was living in groups.

> "… probably spent most of the daytime looking for food …"

What was life like for them?

Australopithecines probably spent most of the daytime looking for food. Physical evidence of their teeth shows that they were vegetarians. They found picking fruit and seeds easy, while digging roots and tubers from the hard savanna soil must have been a chore. These foods, along with insects, nuts, and other plants, were washed down with water from water holes they shared with grazing animals. They were probably not carnivorous hunters. Prowling lions and other large predators forced australopithecus to climb trees for a night's sleep. Obviously, survival was a 24 hour struggle for the australopithecines.

What are some other fascinating pieces of information?

- "Lucy" is between 3 million and 3.6 million years old.
- The oldest "tools" date to about 2.5 million years ago, but because no hominid fossils were found with these tools, anthropologists cannot conclude that australopithecines made or used tools.
- Some anthropologists believe the "Lucy" skeleton is the so-called "missing link" in our human ancestry.
- Australopithecines may have been nomads with no settled homes.
- Australopithecines likely did not wear clothes.
- "Lucy" as a name for the 1974 Johanson discovery came from the Beatles song "Lucy in the Sky with Diamonds."

Hominid: *Homo habilis*

... about 2.5 million to 1.5 million years B.P. ...

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What does this name mean?

"Hominid" refers to a member of the scientific Family that includes human beings and prehistoric human-like creatures. The genus *Homo* means "man." The species *habilis* means "handy" or "skillful"; therefore, *Homo habilis* describes a man who makes and uses tools.

What is their chronological order in the Hominid Family?

Homo habilis follows australopithecines in sequence; *H. habilis* is considered by anthropologists to be the oldest human species.

When and where did they live?

Homo habilis lived about 2.5 million to 1.5 million years **B.P.** (**B**efore **P**resent) and according to fossil evidence lived in south and east Africa, and southeast Asia.

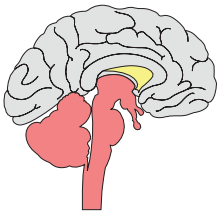
Who are the fossil hunters of these hominids?

Paleoanthropologists Louis and Mary Leakey will always be remembered for their remarkable work in the 1950s and 1960s at east Africa's Olduvai Gorge in Tanzania. The Leakeys were probably the first fossil hunters to reach a wide American audience with their *National Geographic* TV special. Louis, to demonstrate how easily prehistoric humans could hunt small game, actually captured a hare with his bare hands. The Leakeys' sons, Richard and Jonathan, have added luster to the Leakey name with their *habilis* discoveries.

What physical evidence links *habilis* to us?

The Leakeys found skull fragments at Olduvai in 1961. In 1963 more bones and a few stones tools were found at a lower level of their dig. Excavations also revealed a circular area of stones, the base of a hut or shelter. Inside the circle were bones of various animals, likely zebras, giraffes, and antelope, many of which had been cracked, probably for the marrow.

Hominid: *Homo habilis*



What was their brain size?

The brain size of all animals has much to do with intellectual capacity and thinking. From fossil evidence, *Homo habilis*, the first hominid to be our genus, had a brain size of 650 to 800 cc., compared to australopithecines (450 to 500 cc.) and modern humans (*c*. 1400 cc.). *Homo habilis* probably used his brain to fashion tools, communicate somewhat, hunt, and exploit new food sources.

What did they look like?

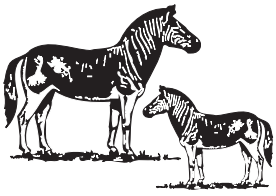
Homo habilis probably looked less like a chimpanzee than *Australopithecus*, with a smaller face, bigger brain case, and shorter arms, stood no more than 5 feet to 5 feet 5 inches, and weighed 100 pounds. Descended from a slender race of australopithecines (*gracile*, not *robustus*), *habilis* was slim as he/she walked upright.

> "… flexible enough to manipulate and handle all kinds …"

What made them human-like?

Like *Australopithecus*, *habilis* walked upright and had bipedal locomotion, with perhaps a slight stoop. Hands were much like modern human hands: flexible enough to manipulate and handle all kinds of objects and do manual tasks. Unlike *Australopithecus*, *habilis* had a larger brain capacity to fashion tools and to communicate with others. Tools enabled *habilis* to kill larger game and increase the variety of food and improve nutrition. They were the first hominids to live in some sort of dwelling.

What was life like for them?



The life of *Homo habilis*, by virtue of a larger brain, differed markedly from the australopithecines' life. *Habilis* probably spent much of his day searching for food, but this task was probably done in social groups. Men hunted animals; women probably gathered up plants, indicating that *habilis* was omnivorous in his diet. Having some speech capacity probably allowed *habilis* to build shelters together. As hunters, the men had to know the patterns of animal behavior in the region, and how to defend themselves from lions, leopards, and other predators. Living on Africa's savannas, *habilis*' increased intelligence and ability to make simple tools improved survival in a hostile environment.

What are some fascinating pieces of information about them?

- *Habilis* probably ate predecessors of pigs, zebras, horses, giraffes, and elephants, but had not mastered fire to cook meat.
- The sabre-tooted tiger competed with *habilis* for food.
- *Habilis* stayed in one region until a lack of food resources forced the group to move on.

Hominid: *Homo erectus*

... about 1.7 million to 300,000 years B.P. ...

Your responsibilities

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What does this name mean?

"Hominid" refers to a member of the scientific Family that includes human beings and prehistoric human-like creatures. The genus *Homo* means "man." The species *erectus* means this ancestor walked fully upright, or erect. Actually, *australopithecines* and *Homo habilis* also walked upright, but their discoveries and classification came many years after *Homo erectus* had been named.

What is their chronological order in the Hominid Family?

Homo erectus follows *australopithecus* (very old human-like creatures) and *Homo habilis*, the oldest type of human being.

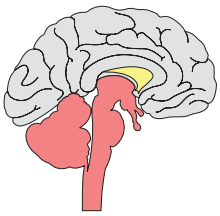
When and where did they live?

Most anthropologists believe *Homo erectus* lived about 1.7 million to 300,000 years **B.P.** (**B**efore **P**resent). According to the physical evidence, *H. erectus* probably evolved from *Homo habilis* in Africa and spread to Europe, east Asia, and southeast Asia.

Who are the fossil hunters of these hominids?

Fossils of *Homo erectus* were first discovered in 1891 in Java (now Indonesia) by Dutch physician Eugene DuBois. He named his collection of bones *Pithecanthropus erectus* (Java Man). In 1906 professor Otto Schoetensack found and classified *Homo Heidelbergensis* (Heidelberg Man) in Germany. In the 1920s Dr. John Gunner Anderson and Dr. Davidson Black worked in China for years before unearthing yet another example of *Homo erectus* called "Peking Man," or *Sinanthropus Pekinesis*. Then in 1984 two almost complete skeletons of *Homo erectus* were discovered, the first by a team led by paleontologists Richard Leakey and Alan Walker. Fortunately, this particular find is the most complete skeleton of a human ancestor ever found. The second discovery in the same year happened in northeastern China.

Hominid: *Homo erectus*



What was their brain size?

Brain size significantly influences an animal's mental capacity to think. The average human today has a brain capacity of about 1400 cc. It appears *Homo erectus* had a brain size of 880 to 1100 cc., much larger than his two predecessors. This brain capacity would enable him to become more human-like in thought and action.

What did they look like?

Still not quite human-looking, *erectus* retained many old-fashioned hominid features: a thick skull, body hair, thick brow ridges, a flatter face, big projecting jaws hiding massive teeth, and virtually no chin. Skeletal evidence indicates that *Homo erectus* was the tallest of all prehistoric ancestors at about 5 feet 6 inches to 6 feet and weighed close to what modern humans weigh, 160 to 170 pounds.

What made them human-like?

Homo erectus walked with erect posture and had a larger brain to enhance his chances of survival by outwitting his animal food supply and larger predators. *H. erectus* lived in small groups and no doubt functioned cooperatively to hunt large game which allowed them to rely on meat protein rather than plants for energy. *Erectus* also found a way to cook meat by harnessing and making use of fire. An *erectus* group probably contained several family units, living semi-permanently in huts or larger dwellings built of large animal bones and skins.

"… one of the greatest events in humankind's long journey to today …"

What was life like for them?

Living in groups with increased communication skills, protected by fire and weapons to ward off predators, eating meat around a blazing fire, and sleeping in shelters rather than in trees indicate that life for *Homo erectus* was distinctly different from the existence of *Australopithecus* or *H. habilis*. Since cooperating with other families likely guaranteed a more reliable and continuous food source, *H. erectus* probably spent less time and effort searching for food.

What are some other fascinating pieces of information?

- Mastery of the use of fire, no doubt the result of some natural accident, lightning, or volcanic eruption is one of the greatest events in humankind's long journey to today.
- If *Homo habilis* was the first toolmaker, *erectus* advanced this technology to include the following: tool-kits with beautifully symmetrical hand-axes (showing pride in their work), scrapers, and carving tools, some made from bone and horn.
- Becoming meat eaters probably enhanced their height and strength.

Hominid: *Homo sapiens neanderthalensis*

. . . about 200,000 to 27,000 years B.P.

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What does this name mean?

"Hominid" refers to a member of the scientific Family that includes human beings and prehistoric human-like creatures. The genus *Homo* means "man." The species *sapiens neanderthalensis* has two parts. *Sapiens* means "thinking man" and *neanderthalensis* refers to the Neander Valley in Germany, where remains of this species was originally discovered.

What is their chronological order in the Hominid Family?

Neanderthals developed after *australopithecus*, *Homo habilis*, and *Homo erectus*. Anthropologists had almost grudgingly placed Neanderthals on the *homo sapiens sapiens* branch of the evolutionary tree as a predecessor to Cro-Magnon. Then in 1997 an important DNA report concluded that Neanderthals represent a separate hominid that emerged before modern humans by about 100,000 years. The findings further suggest that humans and Neanderthals shared a common ancestor that lived perhaps 600,000 years B.P. In short, according to recent scholarship, we moderns did not descend from this "more primitive-looking burly creature."

When and where did they live?

Homo sapiens neanderthalensis lived about 200,000 to 27,000 years **B.P.** (**B**efore **P**resent). The first discovery of Neanderthal fossils was in a cave near Dusseldorf, Germany, but other fossilized bones have been found in Spain, Belgium, and central and southwest Asia.

Hominid: *Homo sapiens neanderthalensis*

"… a century and a half of controversy …"

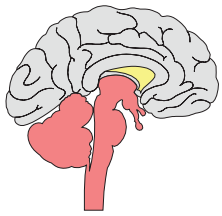
Who are the fossil hunters of these hominids?

Little did the original German workmen know as they quarried for limestone in a cave, that the strange skull and sturdy bones they dug up in 1856 would spark a century and a half of controversy and sometimes heated debate. Initially the bones were examined by two local scholars, J. K. Fuhlott and Herman Schaafhausen. After examining the bones, Dr. William King, an Irish geologist, suggested that the fossil could be an extinct kind of human, but probably a separate species. Then a renowned anatomist took the same fossils and concluded that they were a modern *Homo sapiens sapiens* with clearly different anatomy resulting from prehistoric diseases and a violent, primitive lifestyle. After several more discoveries of Neanderthal fossils in southern France, a French paleontologist, Marcellin Boule, was given the task of clearing the air about this prehistoric creature.

Boule's description of Neanderthal, based on his examinations, led to years of the unchallenged misconception that they were "brutish, clumsy, hulking, ugly, and simian." For all practical purposes, Boule had stereotyped Neanderthal as cavemen and cavewomen such as the old Alley Oop cartoon strip creatures. It wasn't until 1957 that serious scholarship challenged Boule's interpretation.

What physical evidence do we have likely linking them to us?

While the majority of paleoanthropologists would say that Neanderthals are "a dead end" and have little to do with modern human ancestral history, the fossils found in Europe and Asia will continue to be scrutinized. A skullcap, ribs, part of a pelvis and some limb bones were taken out of the first cave. Over the next century, digs in Iraq (Shanidar) revealed more bones, including the skeleton of a man who was probably handicapped from a serious birth defect. The Shanidar cave excavation also led to the conclusion that Neanderthals buried and mourned their dead. In France, an ax and an offering of meat found in a grave of a teenage boy indicates a belief that at least these two objects would be needed in an afterlife.



What was their brain size?

Based on the skulls found, paleoanthropologists have concluded the Neanderthals had a brain size equal to and somewhat larger than Cro-Magnon and modern humans (*c.* 1400 cc.). Yet, it is probable that the brains of Neanderthals, encased in a thicker skull, were less developed in areas needed for language development and higher intellectual pursuits.

Hominid: *Homo sapiens neanderthalensis*

What did Neanderthals look like?

Based on the fossils, scientists believe that the average Neanderthal was about 5 feet 6 inches tall, strong, hairy, barrel-chested, and walked fully erect (but with bowed legs). He had heavy brow-bridges and a sloping forehead, with no doubt a bulbous nose. Large teeth were hidden behind a chinless, broad face with powerful jaws. In short, Neanderthals were thickset and muscular all over, capable of enduring cold and most hostile climate environments.

"… were in many ways like us, but they weren't us."

What made them human-like?

Neanderthals were in many ways like us, but they weren't us. They walked erect, used simple stone tools, lived in groups in caves or other primitive dwellings, honored and buried their dead, communicated in some way, and probably wore clothes. Additionally, Neanderthals were superior hunters, exemplary in those skills necessary to sustain life: stalking and killing small and larger game, like bear, rhinoceros, bison, and mammoths.

What was life like for them?

When approaching Neanderthals in their habitat, we would notice that they relied on their physical strength—as one author has phrased it, they were the complete picture of a "muscle-bound throwback." For most of their short lives, Neanderthals used their mighty physiques to face the challenges of a tough existence. Walking 20 miles a day, often on icebound terrain, while carrying heavy loads was a common task. Most of their semi-nomadic existence was spent, as those hominids before them, hunting and gathering, and at these tasks, Neanderthals had no peers. Yet, hunting and living in groups and speaking some sort of gestural, signaling language around a campfire, must have allowed these unappreciated creatures time to enjoy each other's company and put aside thoughts of tomorrow's hunt.

"… no doubt twice as powerful

as that of a modern human …"

What are some other fascinating pieces of information?

- One Neanderthal grave has been found with the deceased's bones on a bed of pine branches covered with flowers.
- Neanderthals had massive bones and were probably heavier by 10 percent to 20 percent than any modern humans.
- Neanderthals were the first hominids to face and survive cold Arctic winters during the Ice Age.
- Their hand grip was no doubt twice as powerful as that of a modern human.

Hominid: *Homo sapiens sapiens (Cro-Magnon)*

... about 40,000 to 8,000 years B.P. ...

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What does this name mean?

"Hominid" refers to a member of the scientific Family that includes human beings and prehistoric human-like creatures. The genus *Homo* means "man." The species *sapiens* means "thinking man" and *sapiens* repeated means "double wise man." Cro-Magnon (pronounced **crow-MEN-yon** or **crow-MAG-nun**) means "big hole," referring to the rock shelter cave where the bones were first found in 1868 in southern France. The term Cro-Magnon is ambiguous and imperfect, but it's use for over a century will probably give it longer life.

What is their chronological order in the Hominid Family?

Cro-Magnons, or *Homo sapiens sapiens* are the direct antecedents of modern humans. They are in fact our direct ancestors and are us! All human beings on Earth today are descendants of Cro-Magnons.

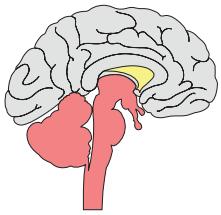
When and where did they live?

Cro-Magnons, fully "modern" human beings, show up in the fossil record about 40,000 years **B.P.** (**B**efore **P**resent) and, of course, continue on down from that time. Being a very mobile and inquisitive species, Cro-Magnons colonized all continents except Antarctica. Descended from earlier ancestors in Africa, they spread out from the Near East to the coasts of Europe and the Black Sea, and eventually all over the world, occupying every kind of environment. They began farming and building cities along river valleys about 8,000 years B.P.

Hominid: *Homo sapiens sapiens (Cro-Magnon)*

Who are the fossil-hunters of these hominids?

While many names are attached to the fossil study of *Homo sapiens sapiens*, two scientists stand out over the others. Inspired by archaeological finds by Boucher de Perthes at Abbeville, France, Edouard Laret, a respected paleontologist, teamed up with a London banker and amateur ethnologist Henry Christy. In the 1860s, they led a series of major digs in the Les Eyzies area in Dordogne, France, later called "the prehistoric capital of the world" for what was discovered on or in its limestone walls and caves.



What was Cro-Magnons' brain size?

Because they are us, this last of the prehistoric hominids possessed a brain size about the same as modern humans, *c.* 1400 cc.

What did they look like?

Using basic logic after examining Cro-Magnon skulls and bones, scholars have concluded that they looked like us today. Whether Cro-Magnon people had curly or straight hair, thin or thick lips, or even round or almond-shaped eyes, differences in their skeletons and those of humans today are very minor. Their average size was 5 feet 7 inches to 6 feet; they weighed about 150 to 160 pounds Regardless of small differences, anthropologists believe that if a Cro-Magnon man or woman were groomed and dressed in modern fashions, he or she, unlike other earlier hominids, could walk right into a mall and resemble a human today—at least in appearance. Further, Cro-Magnons would have the mental ability to learn job skills and customs in order to function in our society. (Incidentally, Cro-Magnons wore sewn clothes made from animal skins and fur.)

> "… could walk right into a mall and resemble a human today …"

What made them human-like?

From all the fossil evidence, Cro-Magnon were far more like us than any other predecessors. They were great hunters, fishermen, and toolmakers. They mastered the use of fire, and they buried their dead with honor and respect. More than anything else, Cro-Magnons were sculptors in bone, wood, and stone, and created the greatest cave art of all time. Cave walls in southern Europe, especially the magnificent paintings at Lascaux, France, and Altamira, Spain, are virtual "sanctuaries" of prehistoric art.

Hominid: *Homo sapiens sapiens (Cro-Magnon)*

> … life for Cro-Magnons was much different from …

What was life like for them?

Cro-Magnon peoples were mostly nomadic, yet their sophisticated skills for making tools and weapons allowed them to master their environment much more than did their predecessors. Sharp, piercing arrowheads on arrows used with bows, the spear-thrower, harpoons and hooks, and the like, gave them an edge over larger animals, especially as they cooperated to bring down large herds of bison, reindeer, wild oxen, and mammoths. With a more or less guaranteed food supply, Cro-Magnons would have more time to create a Stone Age "culture," design and make jewelry, needle-stitch clothes, and paint hunting scenes on cave walls using a "lamp." Thus, life for Cro-Magnons was much different from the survival existence endured by the australopithecines, *Homo habilis*, *Homo erectus*, or Neanderthals.

What are some other fascinating pieces of information?

- In the local French dialect, Cro-Magnon literally means "big-large" or "great-big."
- More than 70 Cro-Magnon cave art sites have been found in France.
- Both the caves of Lascaux and Altamira were found by lost children.
- Cro-Magnon people lived at the end of the last Ice Age when much of Europe and Asia were covered with glaciers. Therefore, they created warm clothes of fur and skins.
- Cro-Magnons probably played the world's first "music" on primitive bone whistles and flutes.
- Apparently so similar to human beings today, Cro-Magnons fit well into the scientific theory of evolution and the Biblical account of man's special creation.

SEMINAR NOTE-TAKING/NOTE-MAKING MODEL

Your name: Jenna Andrews Date: _____

Comments about this Model: **"Taking"** notes differs from **"making"** notes. When you **"take"** notes, you write down KEY FACTS and STRONG IMAGES you hear and see. When you **"make"** notes, you filter through your mind these first notes you have taken. Then you write your personal thoughts. The result? You **"make meaning"** from what you first wrote. This meaning will remain with you for a long time.

Seminar Topic: The Jeffersonians (Famous Founding Fathers)

—Model to follow—

- **Notes taken**

KEY FACTS

- Thomas Jefferson born 1743 and died 1826 (50th anniversary of the signing of Declaration of Independence) - John Adams died same day
- Wrote Declaration of Independence - Governor of Virginia - Ambassador to France - Secretary of State (under George Washington)
- Greatest architect in early days of our nation - Fine horticulturist
- "Father" of University of Virginia (buildings, teachers, and subjects)

STRONG IMAGES

- Tall man, sandy haired, confident looking - writing letter at machine he invented that made a duplicate copy of whatever he was writing
- Monticello - home on top of mountain - scenic view from front of home - fish pond and many flower and vegetable gardens nearby
- In his eighties - standing and looking through a telescope down into Charlottesville - watching the building of his University of Virginia

- **Notes made**

Question(s) I would like answered:

- How did he ever find time to write 30,000 letters during his 83 years?
- How could he write about "life, liberty, and the pursuit of happiness" in the Declaration of Independence when he still owned many slaves?

New thoughts I just had:

- Do we have any men and women today who can think thoughts as large or do as many things as well as Jefferson could? What a genius he was.
- I'm going to urge my family to take a trip to Virginia. I'd love to see where he lived near Charlottesville. Just think of going through his Monticello! It has many of his inventions there. (I wish they'd let you touch them.) I know that some day I'm going to see Jefferson's wonderful hilltop home.
- I'll feel sad when I see the slave quarters.

SEMINAR NOTE-TAKING/NOTE-MAKING

Your name: _____ Date: _____

Seminar Topic:_____

- **Notes taken**

KEY FACTS

STRONG IMAGES

- **Notes made**

Question(s) I would like answered:

New thoughts I just had:

2—PassageII: Survival

> … how to build a fire and how to throw a spear …

Purpose

In Passage II: Survival students leave modern civilization behind and become members of Stone Age bands, forced by their new environment to survive or "perish" as a result of challenges similarly faced by our ancestors 25,000 to 10,000 years B.P. Specifically, in this three to four day passage of **BONES & STONES**, students learn the basics of survival: how to build a fire and how to throw a spear with a spear-thrower. (Both these activities are optional.) A background essay on Hunting and Gathering prepares students for a memory-concentration game in which boys "hunt" animals of that time—woolly mammoths, bison, and auroch. Girls "gather" sunflower seeds to place in baskets. Both gender groups receive Survival Stones related to their success in either hunting or gathering. During this passage, students may also experiment at home with the challenges of a Stone Age diet. A long range PREHISTORIC TOOLMAKING ASSIGNMENT is handed out and explained along with plans to complete tools and demonstrate their use during Passage ~~III~~ I: Conference.

Flourishes

- Find out what each band's greeting grunt is and rotate use of them as you greet your student bands each day.
- Decorate your room to reflect a wilderness atmosphere. A few potted plants or fake trees would add an appropriate ambiance.
- Encourage all bands to make a large totem/logo sign to separate each band from the other bands.
- Consider creating a Bands' Survival Stones Chart, a competitive chart you place on the classroom wall to showcase the various bands' accumulation totals of Survival Stones during the simulation's sequential passages.

Teaching Tip →

You might ask a local nursery to loan out several large potted plants to create the right ambiance.

Materials

Sunflower seeds

- Butcher paper or poster board—*enough for each band*
- Chalk or masking tape—*one*
- Paper strips numbered 1 to 7
- Sunflower seeds in the shell—*two to three small bags*
- Small straw basket—*one*
- "Spear" object to toss at an "animal" target—*one*
  (Recommended: an eraser tossed overhand into a trash can from 10' to15' or a sticky ball thrown at a flannel board from a determined distance)
- Cards 3"×5"—*two packages (different colors optional)*
- Stopwatch—*one*

Duplication

Duplicate the following **Master Pages** (quantity in *italics*):

- HUNTING AND GATHERING—*class set*
- ADOPTING A STONE AGE DIET—*optional class set*
- MY STONE AGE DIET—*optional class set*
- MY STONE AGE DIET RECORD—*optional class set*
- HUNTING AND GATHERING GAME RULES—*class set*
- HUNTING CARDS*—*two sets*
- HUNTING FATE CARDS*—*one set*
- GATHERING CARDS*—*two sets*
- GATHERING FATE CARDS*—*one set*
- FIRE DEMONSTRATION—*one per student volunteer*
- SPEAR DEMONSTRATION—*one per student volunteer*
- PREHISTORIC TOOLMAKING—*class set*
- PREHISTORIC TOOLMAKING ASSIGNMENT—*class set*
- CONFERENCE EXHIBIT CARD—*class set*

Teaching tip →

* *You might want to duplicate all of the HUNTING CARDS on one color paper and all of the GATHERING CARDS on another color paper, cut the cards apart, and have students glue them onto 3″ × 5″ cards.*

Members of the Rock Band seem pleased at Sorg's skills during the Hunting Game.

DAY 1: GREETINGS, FIRE-MAKING, STONE AGE DIETS

1. Before beginning this passage officially, go around the classroom and ask each band to stand and present its banner, totem/logo, handshakes, greeting grunts—unless members choose to keep their grunt secret—and totem badges. Again, you may want to allocate Survival Stones (out of 100) in a similar manner to what you did with the Passage I: Seminar presentations. The actual awarding of these 100 total points could be postponed until the end of the period, either today or tomorrow.

Teaching tip →

If you have an urge to present a lecture—and you are skilled at this technique—here is an opportunity for you to "strut your stuff" using the information in the essay.

2. Pass out the HUNTING AND GATHERING background essay. How to get through this interesting essay is up to you. Options: best student readers read a paragraph each; band members have a silent/oral reading within each band; you read the essay aloud to the entire class. Whichever option you choose, before you move on clarify/discuss major essay ideas.

3. A terrific transition from the essay to the diet activity is to stage the fire building activity. Either skilled students (Boy Scouts? … Girl Scouts?) or you can demonstrate how to build a fire without matches. **NOTE**: See Passage I: Seminar Daily Directions #9 on page 1:5 for cautionary comments. Above all, use good judgment in deciding where the demonstration will take place and who will demonstrate. In any case, close adult supervision is a necessity, perhaps with a local fire fighter, a key parent, or your principal attending.

4. If you have time—or didn't have the fire demonstration—pass out the diet handouts: ADOPTING A STONE AGE DIET, MY STONE AGE DIET, and the MY STONE AGE DIET RECORD. Read through the essay, using yourself or good readers, and commenting on highlights. Then go over the final two handouts and clarify the assignment, emphasizing that this task is *optional*, not a requirement.

Frustration on his face, Piff struggles for the 81st time to ignite his band's fire with a bow-drill.

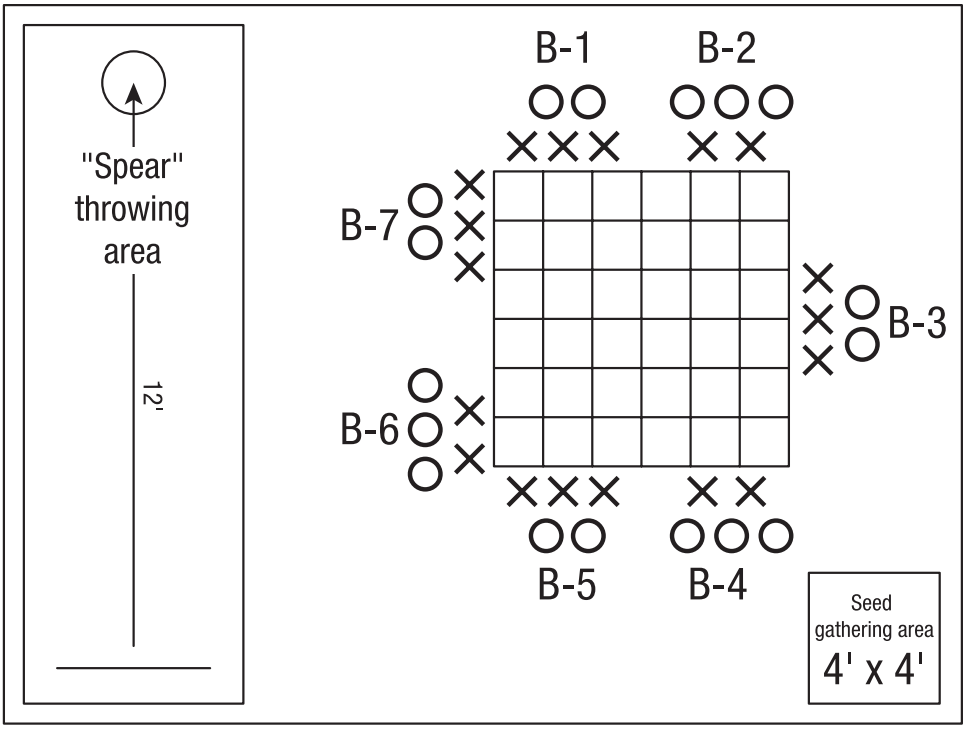
5. Depending on what options you have decided to use on this day, you may have time to briefly explain the Hunting and Gathering games.
   a. Start by asking students if they have ever played a memory game called at times "Match Game" or "Concentration." Most will raise their hands, and this will make your job of explaining the Hunting and Gathering games that much easier.
   b. You may want to have students explain their version of the game first. Then, using the HUNTING AND GATHERING GAME RULES handout, explain how the BONES & STONES game is played.

DAY 2: HUNTING AND GATHERING GAMES

1. If you didn't explain the Hunting and Gathering games the day before, do it now, using suggestions from Day 1.

2. Either make a board outline, summarize in your own words, or make display copies of the HUNTING AND GATHERING GAME RULES to explain the specifics and sequence of the game. Don't progress to the next step until there is universal understanding among your students about how to play the game. In actuality, it's a no-brainer, a slam-dunk.

3. It would be helpful to display a room arrangement for the game on your whiteboard.



Teaching Tip

The number of sunflower seeds within the pre-marked 4' × 4' space should challenge the gatherer, but not be impossible to pick up in the time designated. (You may want to experiment with 12 to 15 seeds.)

If your room is carpeted, mark off the "Seed Gathering Area" with chalk lines. Masking tape will work on hard floors.

4. The procedure and sequence of the Hunting and Gathering games are specified on the handout. Emphasize one other rule: students must not give vocal or gesture clues help to fellow band members during their turn. Students are encouraged to offer moral support to their team mates.

5. Before the games start, as preparation put this simple scoring chart on your whiteboard.

Band Scores

Spear Toss
1st toss = 3 x #
2d toss = 2 x #
3d toss = 1 x #

1	2	3	4	5	6	7

Totals

Seed Gathering
10 seconds = 3 x #
11-15 seconds = 2 x #
16-20 seconds = 1 x #

6. Getting started:
   a. To decide the order in which the bands play the games, put numbers 1 to 7 in a small container and let a representative from each band select a number. Once done, direct the bands to their designated spots around the playing area.
   b. When everything is ready, start the Hunting Game by placing 36 HUNTING CARDS face down on the floor. Boys (hunters) surround the cards; girls as gatherers are behind them to lend vocal support. Shout a loud “Hunt!” to initiate play by Band #1.
   c. The Gathering Game follows the finish of the Hunting Game. Place the 36 GATHERING CARDS face down on the floor. Girls (gatherers) surround the cards; boys as hunters are behind them to lend vocal support. Shout a loud “Gather!” to initiate play by Band #1.

7. Either on this day or the next, take the scores from the games which were tallied on the board, and award the appropriate number of Survival Stones to each band.

8. As a reminder: give students a due date for their MY STONE AGE DIET RECORD. (3 to 5 days, hence?)

DAY 3: DEBRIEFING, TOOLMAKING ASSIGNMENT, SPEAR-THROWING

1. If you haven't awarded Survival Stones for the Hunting and Gathering Games, do so now.

2. To debrief what was learned from the essays, demonstrations, and games, consider these two suggestions:
   - Design and implement a "round table" activity, in which groups use one pencil and one piece of paper to generate without notes a list of as many animals and plants of prehistoric people used for food as they can. Award extra Survival Stones for the longest-generated list.
   - As a quick write assignment, give students 15 minutes to write a brief essay comparing and contrasting the eating habits of prehistoric and modern humans. Collect and grade as a formal writing assignment. A clever wrinkle: have them write the essay on paper plates!

Teaching tip

As another follow-up activity, call on one student to explain "How to build a fire without matches."

3. Pass out the PREHISTORIC TOOLMAKING essay and ASSIGNMENT.
   a. Practice the reading skills you feel are appropriate for your students.
   b. Either now or as the due date nears, you will give your students the CONFERENCE EXHIBIT/EVALUATION CARD, on which details of the tool and its excavation are enumerated.
   c. During Passage ~~III~~ I: Conference, students will exhibit and demonstrate their homemade tools.
   d. Finally, give students an approximate due date for this toolmaking assignment.

4. This would be an appropriate time to demonstrate the spear and spear-thrower activity. Once again, See Passage I: Seminar Daily Directions #9 on page 1:5 for cautionary comments. Above all, use good judgment in deciding where the demonstration will take place—a large grassy and open area—and who will demonstrate the spear throwing. Wherever you stage the demonstration, close adult supervision is a necessity, perhaps with a school coach, a key parent, or your principal attending.

Just in case Piff is skeptical, Flint demonstrates the spear thrower's potential in bring down fresh meat.

> ... we have been hunters and gatherers for probably 100,000 generations ...

The essence of life itself

Hunting—stalking and killing various sizes of animals—and gathering—collecting, plucking, picking up non-animal food sources—was the context in which humans evolved as life forms co-existing on this planet with millions of species of plants and other animals. We have been hunters and gatherers for probably 100,000 generations, a time period longer than we've done anything else. We human beings have been controlling agriculture for only 500 generations, have been creating industries for only ten generations, and have been exposed to the world of computers for only a little more than one generation. For most of our ancestors, from the time of the australopithecines through Cro-Magnons, hunting and gathering was the essence of life.

Early scavengers

It appears that early hominids were not the skilled, efficient hunters that *Homo erectus*, Neanderthal, and Cro-Magnon became. Much of the meat diet of the australopithecines and *Homo habilis* was influenced by scavenging. The African savanna was inhabited by many meat eaters that still roam these regions today. To get their share of meat and to stay mostly away from large carnivores such as lions, leopards, and wild dogs, early humans observed the killing and eating patterns of these animals. Often the only meat they could obtain was leftover carcass meat abandoned by the satiated or distracted meat-eater. Being bipedal and erect with a few large stones in hands to throw, humans in groups could occasionally claim a half-eaten carcass.

> …without question the greatest hunters of all time …

Carnivores

Even non-human primates hunt for animal flesh, although their natural diet is basically vegetarian. Studies indicate that when gorillas in captivity are given a red-meat diet, they eventually prefer flesh over nuts, leaves, and roots. Choices between a vegetarian and fresh meat food supply must at some point have confronted *Australopithecus* and over time he, too, decided to become a carnivore, although plant sources would always be part of human diet. Since the time of *Homo erectus*, meat from hunting was the dietary mainstay for hominids. Prehistoric hominids, particularly Neanderthals and Cro-Magnons, were without question the greatest hunters of all time. Their great skills helped them survive beyond what they could pick up off the ground or off trees and bushes and eat to sustain life.

Gathering

Because hunting was not always successful, bands of prehistoric people also continued to rely on plant foods gathered by women. When this was the case, they had perhaps a core of 10 to 20 staple vegetable foods and a supplement of over 60 to 70 more choices, depending on the season of the year and the region where they lived. Women and children, including boys too young to hunt, spent perhaps 10 to 20 hours per week gathering or foraging for fruits, nuts, seeds, beans, roots, tubers, stalks, bulbs, berries, melons, leaves, fungi, and flowers, most of which could be turned into tasty and nourishing food. Gathering usually required a leather sack or reed basket, a digging stick, patience, and abundant stamina, since children had to be carried or watched. Additionally, women had to be on the lookout for certain plants and herbs found over time to have medicinal or therapeutic value. In novelist Jean Auel's popular *The Clan of the Cave Bear*, her heroine, Ayla, is the clan's expert on healing herbs and plants. (Example: "Dried horsemint flowers and leaves are good for scalds."

"… hunters could speak to one another and cooperate ..."

Cooperative hunting

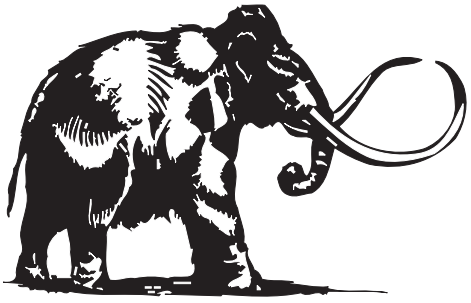
Over time, perhaps thousands, even millions of years, hunting changed for hominids for several reasons: early hominids learned to control fire, made better weapons, and, above all, began mastering language so that they hunted cooperatively. How effective it was when hunters could speak to one another and cooperate! A group could kill more often than an individual hunter, and the group could bring down larger prey with a choice of hunting strategies not open to a single hunter. All these developments helped hominids gain a constant source of fresh meat to supplement a diet of nuts, berries, plant food, and smaller game. After killing and butchering a large animal, what wasn't eaten on the spot, was taken back to camp to feed the women and children. Food sharing from such a hunt had important social implications for the division of labor between the genders.

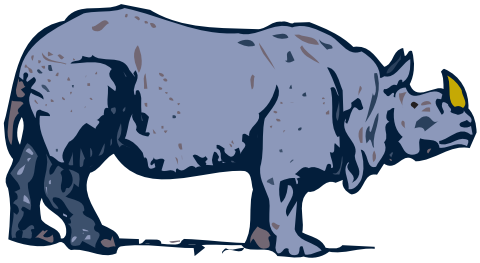
A serious business

To sustain a steady meat supply, hunters learned to use a pattern while hunting. First, they had to locate the animals. This skill reflected passed-on knowledge and observation of animal behavior. Next, the hunters had to locate and bring stones, cobbles, and other crude weapons to use in the attack. Skill in tossing stones might have taken years of practice to develop. By the time of Neanderthals and Cro-Magnons, stones and cobbles would be replaced for the most part by spears—and that great hunting supplement, the spear-thrower—as well as bows and arrows, both of which allowed hominids to keep a safe distance between them and the animals they were hunting. Obviously, from the time of *Homo erectus* hunting required thought and skill. It was now a way of life, involving language, social organization, and a constantly-improving technology in weaponry. In short, hunting was as much a mental activity as a physical one. A superb hunter needed several traits: guile, strength, patience, and bravery.

The hunt

There were two parts to hunting. First, stalking the animals required watching them for hours or days. If the prey had not been seen, the hunters had to look for spoor (droppings), and telltale signs like hoof prints or other indications of migration or movement. Sometimes the persistent stalking (chasing) of the animal could result in its kill by wearing it down. Paleoanthropologist Louis Leakey actually ran down an African hare and caught it with his bare hands. More common, however, was the use of spears, large stones, bolas and slings, and later bows and arrows. A whirling bola, or cord with rocks at each end, thrown at a large animal could tangle the legs and make it vulnerable to spear thrusts from other hunters. On occasion, large bands of prehistoric hunters might try to capture and kill an entire herd of animals. To do this the hunters would drive the herd into a muddy area or off a cliff. Frightening yells and torches would be effective tactics in accomplishing these goals.





As a rule, the animals primitive men hunted included lions, baboons, antelopes, gazelles, horses, zebras, elephants, mammoths, rhinoceros, bison, ibex, reindeer, auroch (oxen), boars, wolves, goats, bears, and of course, smaller game such as lizards, hares, foxes, fish, and seafood.

Sucking the marrow

Once the kill had been made, hunters would continue to thrust their spears in the animals' flesh and heave heavy rocks at their skulls until there was no evidence of life. Butchering a mammoth, not an easy undertaking, probably followed this pattern. The carcass was stripped of its choice pieces of flesh with scraping tools, bones were broken and the marrow sucked out, and the animals' brains were probably removed and eaten. Following a victory feast, the hunters carried most of the meat in some dried, preserved form back to a camp for others to enjoy, perhaps around a roaring fire while brave men bragged about every last detail of the hunt.

Not all of each animal was eaten. Hide made good shoes; long hair was twisted into sturdy cord; and the bladder, stomach, and intestines could be used for water containers, soup pots, or food storage.

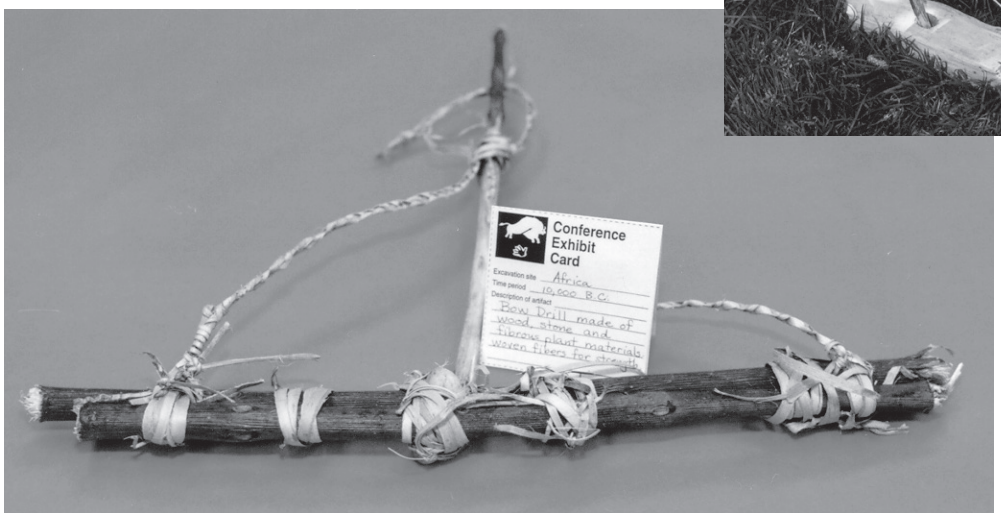
> … could light up the dark and extend prehistoric humans' days ...

Mastering fire

Fire over which to cook the flesh and entrails of dead animals was not always the final part of the hunt. Until the time of *Homo erectus*, meat was probably eaten uncooked. Yet, once fire was mastered by prehistoric people, cooking food was only one significant change this usually destructive natural force brought to their existence. Fire also kept people warm, especially later hominids like Neanderthals and Cro-Magnon, who lived during the last Ice Age. Further, fire could be used for defense against large predators and last, and perhaps most important, fire could light up the dark and extend prehistoric humans' days. Adding hours to a short winter day, a burning hearth inside a cave or man-made dwelling allowed more time for domesticity, language development, and leisure activities like sewing, carving/sculpting, and even wall painting.

Frustration on his face, Piff struggles for the 81st time to ignite his band's fire with a bow-drill.

On exhibit at an annual paleoanthropologist conference is a bow-drill fire starting tool, moot testimony to the skills of our hominid ancestors.



Popular topics

Two of the most popular topics often read about and seen in the media are nutrition and dieting. Pick up any women's magazine in particular and the cover announces in almost every case that it has a "Lose 10 pounds for that summer-slim look" kind of article inside. Dieting has become, for too many Americans, an obsessive behavior.

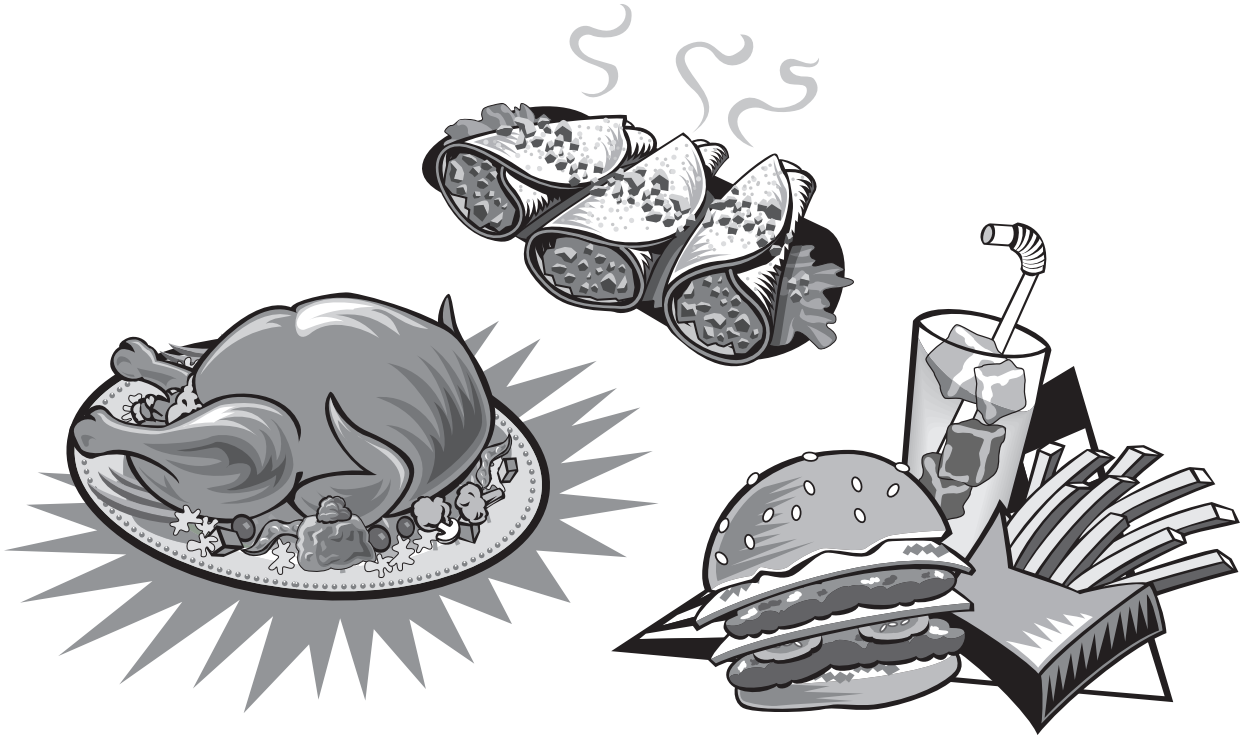
The power of advertising

Part of the problem, it has been surmised, is the clever bombardment of food advertising from large snack and fast food companies pushing calorie and fat-laden hamburgers, candy bars, and soft drinks as well as potato/corn chip products. A similar avalanche of diet books advises men as well as women to eat more protein and less carbohydrates, or less protein and more carbohydrates, or only fruit in the morning, and carbos in the afternoon or …? Needless to say, what to eat has become confusing.

"… the clever bombard-ment from food advertising ..."

More and more vegetarians

In the face of these advertising distortions and mixed signals from nutritionists, many Americans have chosen to become vegetarians, convinced that over the years their human "machines" will keep working better and longer. Some vegetarians are convinced for another reason. John Robbins in his popular book *Diet For a New America* warns that our society and our planet are headed for disaster if we don't break the tight hold that the "evil" beef, poultry and dairy industries have on the world, but especially in America.



A diet book with a new message

Perhaps a more moderate voice comes from Eaton, Shostak, and Konner's book *The Paleolithic Prescription*; they recommend eating a diet somewhat similar to one which our Stone Age ancestors followed. In brief, people of the last 150 years or so have abandoned the evolutionary eating patterns to which our ancestors adapted over the millennia and which are genetically best for humans. From all evidence, prehistoric people were lean, tall, strong, and aerobically fit, and they were free of the chronic diseases of civilization (hypertension, heart disease, cancer, diabetes, obesity, and tooth decay) which continue to plague us. No doubt a diet of seeds, nuts, fruits, vegetables, and lean meat had much to do with their health. Incidentally, "Meat is, and has always been, a major constituent to the human diet," write the authors. They worry about our American future if we continue to digest high calorie fatty fried foods and if we fail to follow the wisdom found in a "prehistoric" diet. They predict soaring health costs for our way of life if we don't make some changes. Authors of *The Paleolithic Prescription* urge readers "to reinstate crucial features of Paleolithic life, blending the best from the past with the best from the present."

Your turn

Having read the above, you now have a chance to create a Stone Age diet as part of your role in **BONES & STONES**. You will receive a special form along with this brief essay. On it you will make choices of foods advocated in the book described above. You will also keep track of what you eat—and how you feel—over a four to seven-day period. ***Good eating!***

The Paleolithic Prescription

"… blending the best from the past with the best from the present …"

MY STONE AGE DIET

Directions:
Before you start this nutritional experiment, be sure to get at least one parent to approve your participation by signing the form below. Maybe your parent will join you, making planning and cooking easier, and you will have a partner in your quest for a healthy diet.

Stone Ager name: _____

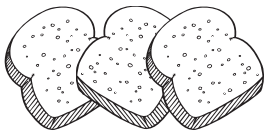
Real name: _____

Parent's signature: _____

No one expects you to eat raw mammoth brains, or even thistle, twigs, or your hamster. In fact, many species eaten by early hominids are now extinct. To duplicate the same foods our ancestors ate is almost impossible. Imagine trying to find in the local supermarket such foods as reindeer, fox, caribou, giant sloth, flamingos, bear, catmint, grubs, or quail eggs. Nevertheless, many foods exist that are similar to foods eaten during the Stone Age. If you have a "health" market in your community, try to arrange a visit to buy organic (grown without fertilizer) foods consistent with the approved list below:

Approved "Stone Age" foods to eat

- fish and seafood
- small game (e.g., rabbit, chicken)
- bison (buffalo meat)
- seeds and nuts (raw, without salt)
- lots of fruits (including figs)
- lots of vegetables (including beans)
- lots of water (eight to 10 glasses per day)
- whole grains such as barley, bulgar, oat bran, corn bran, rice, millet, and buckwheat, rye
- tubers (potatoes and sweet potatoes)
- small amounts of cereal grains
- pita bread and whole grain breads
- honey—*the **only** sweetener allowed in your Stone Age diet!*
- berries
- shoots and roots
- edible leaves and flowers
- lean red meats (sparingly)
- whole wheat bagels and rolls
- rice cakes



Foods to avoid

- all fried foods
- dairy products, including milk
- packaged foods (especially with preservatives)
- candy, cake, donuts, etc.
- other foods with high fat and calorie content
- potato chips, corn chips, crackers, and other snack foods
- all fast foods

Summary statement

Your goal is to eat an abundance of natural, wholesome food with few or no chemical additives. Keep track of what you eat on **MY STONE AGE DIET RECORD**. And why not do one more thing your ancestors did—exercise by walking or running outside each day. The combination of wholesome, low-fat foods and daily vigorous exercise will make a difference in your life!

MY STONE AGE DIET RECORD - 1

_____ _____

Stone Ager name Real name

Describe your eating habits and choices of food ***BEFORE*** beginning the MY STONE AGE DIET experiment:

Describe your eating habits and choices of food ***AFTER*** beginning the MY STONE AGE DIET experiment:

Day_____

Upon Rising: …	At Midday: …	At Evening: …

"Snacks" throughout the day: …

Day_____

Upon Rising: …	At Midday: …	At Evening: …

"Snacks" throughout the day: …

MY STONE AGE DIET RECORD - 2

_____ _____

Stone Ager name Real name

Upon concluding the MY STONE AGE DIET experiment, draw some conclusions either below or on a separate sheet of paper.

1. How difficult was it to follow this diet?
   Give concrete examples of key difficulties and how you coped with each.

2. What was good about the diet?

3. What was bad about the diet?

4. Did you notice any changes in yourself during and after using the diet? Explain in detail.

5. Have you decided to make some permanent changes in your personal nutritional program as a result of your experiment with MY STONE AGE DIET? Explain any change specifically.

HUNTING AND GATHERING GAME RULES - 1

Introduction
The Hunting and Gathering Game is designed to help you learn about the animals and plants that were early humans' food supply. The HUNTING AND GATHERING essay introduced this aspect of prehistoric life to you so that the how, what, and why essentials of foraging for plants and stalking and killing food are now fairly clear.

Object of the game
The game challenges a contestant's short term memory. Many American children have played this game, usually called either The Match Game or Concentration. The game cards are first placed face down. They are turned face up, two at a time and viewed for only a few seconds, then turned face down again. The challenge is to remember the random positions of two matching cards (for example, where the two CAVE BEAR CARDS are) after they have been turned face down.

Playing rules
1. In separate decks are 30 HUNTING CARDS (15 pairs) and six HUNTING FATE CARDS, and 30 GATHERING CARDS (15 pairs) and six GATHERING FATE CARDS. Boys, being the hunters, play only the Hunting Game. Girls, being the gatherers, play only the Gathering Game. On each HUNTING CARD is an animal and on each GATHERING CARD is a plant which shared the world with prehistoric people, mostly as a food source.

2. The game is played on the classroom floor with the bands surrounding the 36 CARDS, which have been shuffled and placed face down. While the hunters surround the HUNTING CARDS, the gatherers should be behind them giving vocal support—*but **not** memory help.* While the gatherers surround the GATHERING CARDS, the hunters should be behind them giving vocal support—*but **not** memory help.*

3. Taking turns, each band tries to make a match. (A different band member plays for each round of play.) While play is on, the two CARDS selected must be turned over for at least a few seconds (so members of all bands can see them) before being turned face down for continued play.

5. When a hunter or gatherer matches two CARDS, the CARDS remain face up; he or she has successfully stalked the creature or found the food. This successful player must now complete a feat of skill to have the successful hunt result in food (Survival Stones) for his or her band.

Members of the Rock Band seem pleased at Sorg's skills during the Hunting Game.

Hunters …

After successfully stalking a woolly mammoth, Jadd now attempts to "make a kill" with an accurate spear toss.

6. In **the hunting round**, the successful stalker (match maker) stands erect and, from a line drawn on the floor of the room, tries to throw overhand an object (eraser) into a receptacle (trash can), as if the hunter is tossing a spear at the animal. Survival Stones are won based on his skill with the toss:
   a. **Successful first toss** = Three times the number of Survival Stones indicated at the bottom of the HUNTING CARD.
   (Example: Caribou … 3×2=6 Survival Stones).
   b. **Successful second toss** = Two times the number of Survival Stones indicated at the bottom of the HUNTING CARD.
   c. **Successful third toss** = The number of Survival Stones indicated at the bottom of the HUNTING CARD.

Gatherers …

Under the pressure of time, Lara shows off her skills in gathering edible and medicinal plants during a round of the Gathering Game.

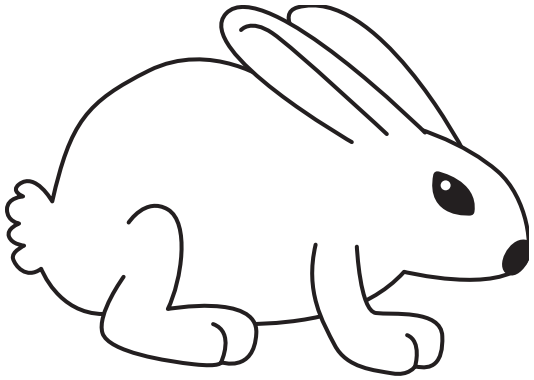
7. In **the gathering round**, the successful gatherer (match-maker) walks over to a designated area where the teacher hands her a small reed/straw basket in which to gather sunflower seeds. Once the teacher spreads a certain number of seeds over a 4' × 4' area, the gatherer must pick up the seeds **one at a time** (no scooping!) and place each in her basket, working as quickly as possible. The teacher or another player will be timing the gatherer. Survival Stones are won if all the seeds are in the basket in:
   a. 10 seconds or less = Three times the number of Survival Stones indicated at the bottom of the GATHERING CARD.
   (Example: Fenugreek … 3×3=9 Survival Stones)
   b. 11 to 15 seconds = Two times the number of Survival Stones indicated at the bottom of the GATHERING CARD.
   c. 16 to 20 seconds = The number of Survival Stones indicated at the bottom of the GATHERING CARD.

8. Play continues with the next band's turn. Proceed in this order of play until all HUNTING or GATHERING CARDS are face up.

9. The FATE CARDS do not have any matching cards. A FATE CARD will have an immediate impact on your band's number of Survival Stones. You will either win or lose Survival Stones as soon as a FATE CARD is turned up. The FATE CARDS will remain face up after they have been discovered.

HUNTING GAME CARDS - 1

HUNTING GAME CARD



Hare (Rabbit)

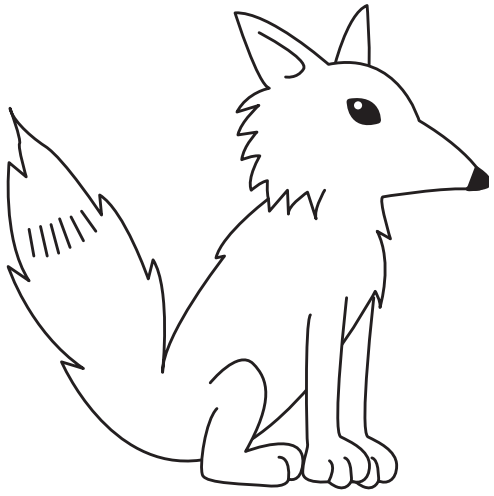
Gain **1** Survival Stone

HUNTING GAME CARD

Squirrel

Gain **1** Survival Stone

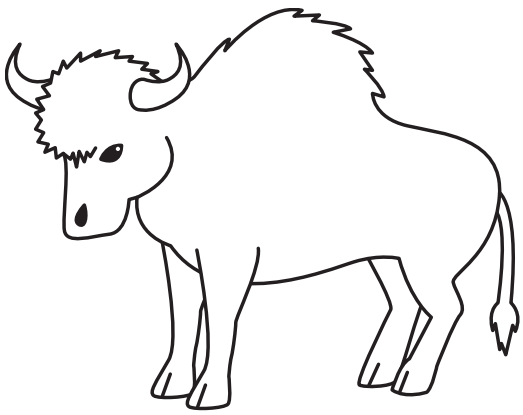
HUNTING GAME CARD



Fox

Gain **1** Survival Stone

HUNTING GAME CARD

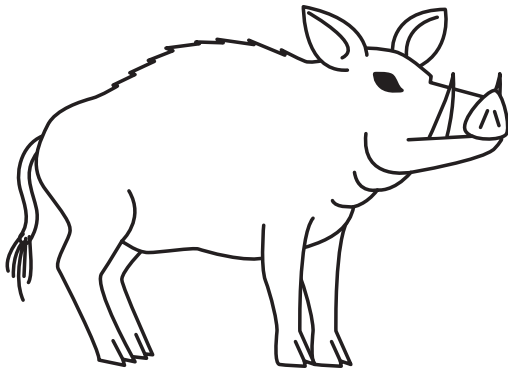


Bison (Buffalo)

Gain **2** Survival Stones

HUNTING GAME CARDS - 2

HUNTING GAME CARD



Boar

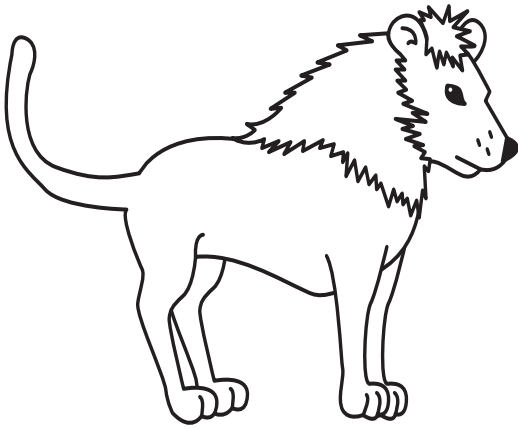
Gain **2** Survival Stones

HUNTING GAME CARD

Sloth

Gain **2** Survival Stones

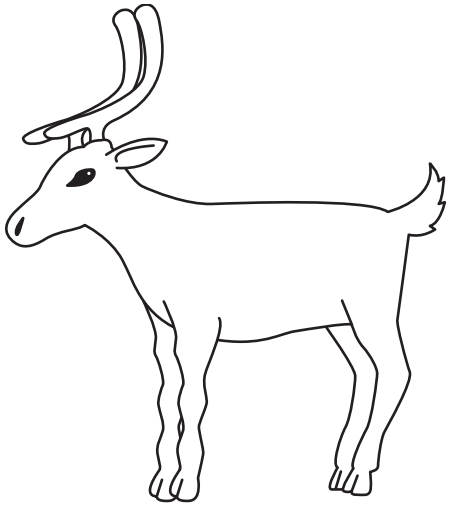
HUNTING GAME CARD



Cave Lion

Gain **2** Survival Stones

HUNTING GAME CARD

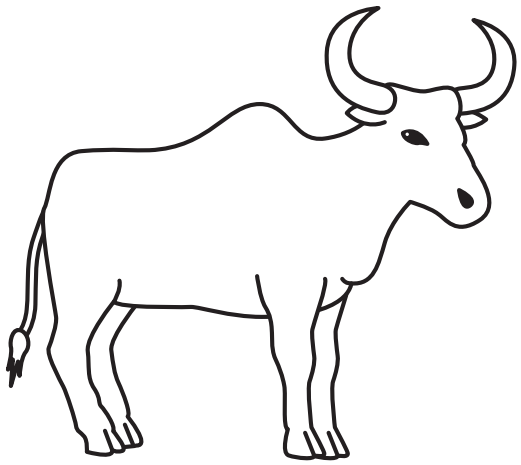


Reindeer

Gain **2** Survival Stones

HUNTING GAME CARDS - 3

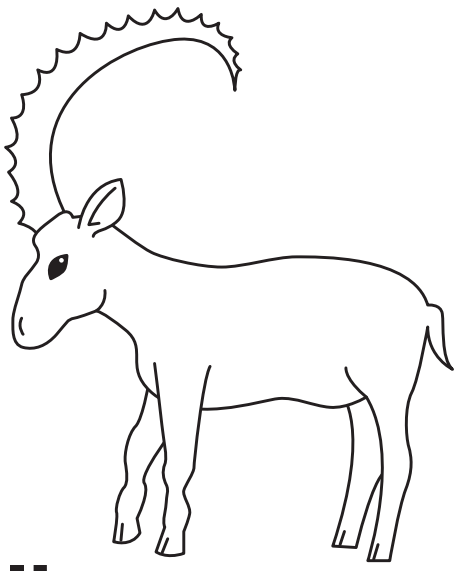
HUNTING GAME CARD



Auroch (Ox)

Gain **2** Survival Stones

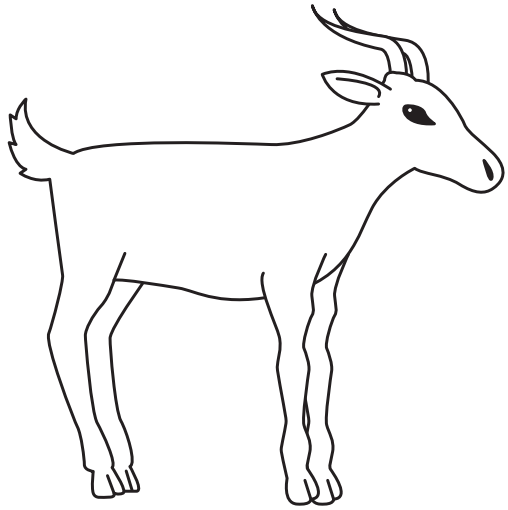
HUNTING GAME CARD



Ibex

Gain **2** Survival Stones

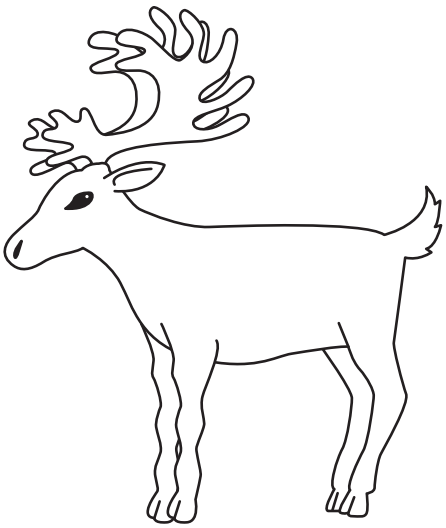
HUNTING GAME CARD



Gazelle

Gain **2** Survival Stones

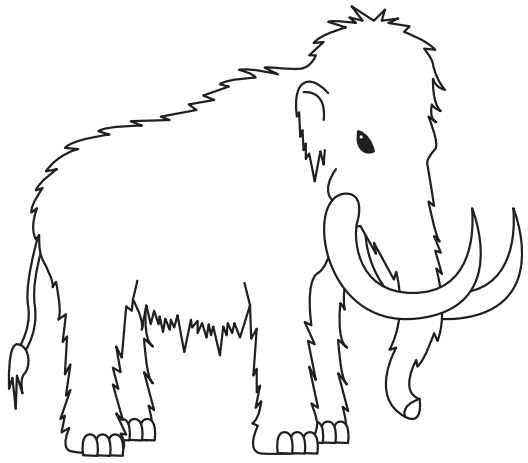
HUNTING GAME CARD



Caribou

Gain **2** Survival Stones

HUNTING GAME CARD



Woolly Mammoth

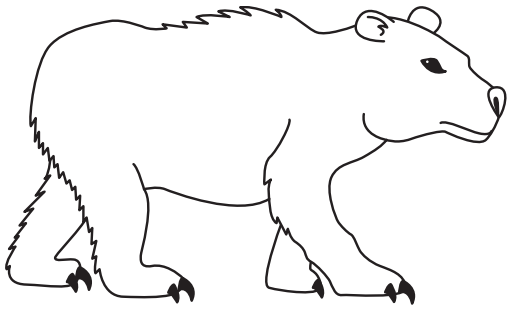
Gain **3** Survival Stones

HUNTING GAME CARD

Woolly Rhinoceros

Gain **3** Survival Stones

HUNTING GAME CARD



Cave Bear

Gain **3** Survival Stones

HUNTING FATE CARDS - 1

HUNTING FATE CARD

Your band has good fortune. A bison herd has migrated into your region, eating the local grasses. Your prospects for fresh meat have excited all your band members.

Gain **1** Survival Stone

HUNTING FATE CARD

Your best hunters stalked a rhino. All tossed stones and hurled spears missed, and the animal ran away. This lost opportunity has depressed all your band members. They are moping around with sad faces.

Lose **2** Survival Stones

HUNTING FATE CARD

A long, bitter winter causes your band's hunters to lose valuable weeks for a spring hunt of red deer and aurochs.

Lose **3** Survival Stones

HUNTING FATE CARD

A successful mammoth hunt has brought fresh meat and necessary fat (fuel and fire-starting), tough hide (shoes, cave doors), long hair (cord), bladders, and stomachs (water containers and pots).

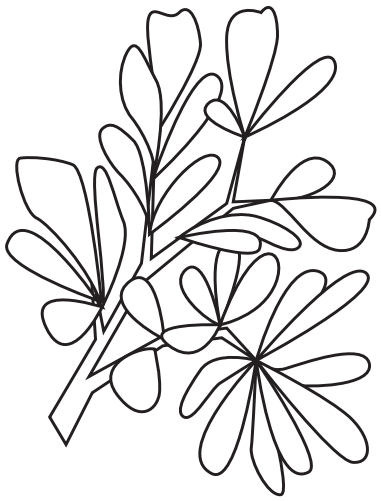
Gain **3** Survival Stones

HUNTING FATE CARDS - 2

HUNTING FATE CARD	HUNTING FATE CARD
Your cave fire was blown out by a strong draft of wind. No one who is present can re-light it, forcing all of your band members to eat cold food and grasses in the scary darkness as giant wolves howl nearby.	Practicing with bolas and sling weapons pays off. Your hunters quickly bring down and kill four horses and two foxes during two days' hunting. Fresh meat is the main course at a feast for your band!
Lose **2** Survival Stones	Gain **2** Survival Stones

GATHERING GAME CARDS - 1

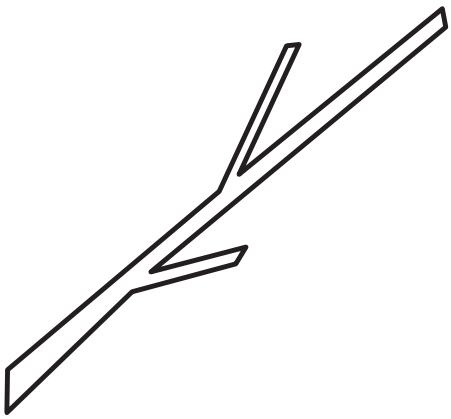
GATHERING GAME CARD



Rue

Gain **1** Survival Stone

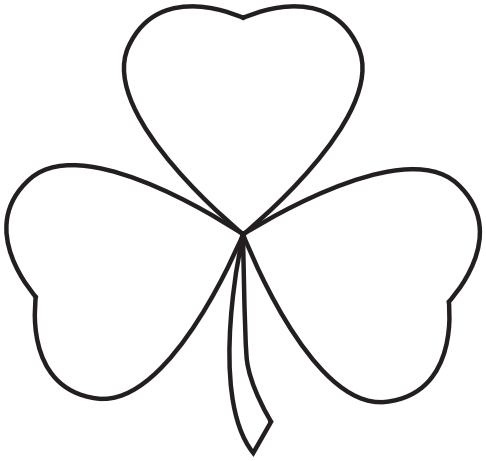
GATHERING GAME CARD



Hazel Twig

Gain **2** Survival Stones

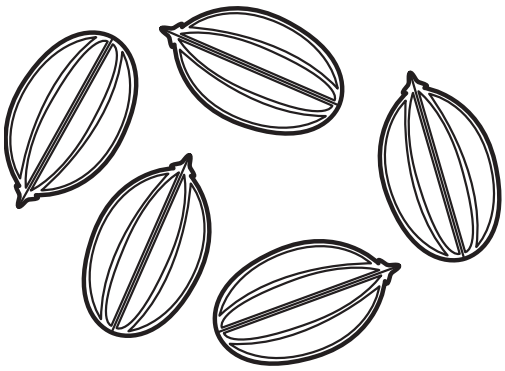
GATHERING GAME CARD



Clover

Gain **1** Survival Stone

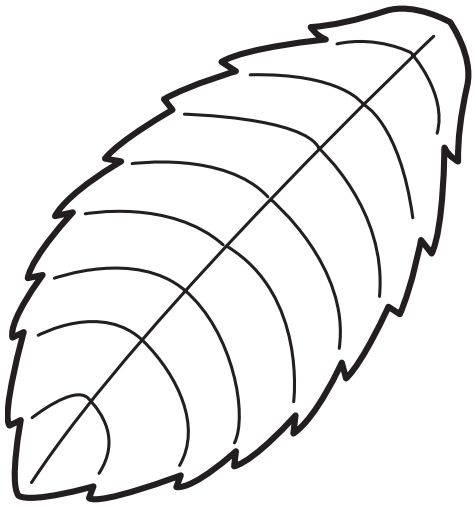
GATHERING GAME CARD



Black Cumin

Gain **1** Survival Stone

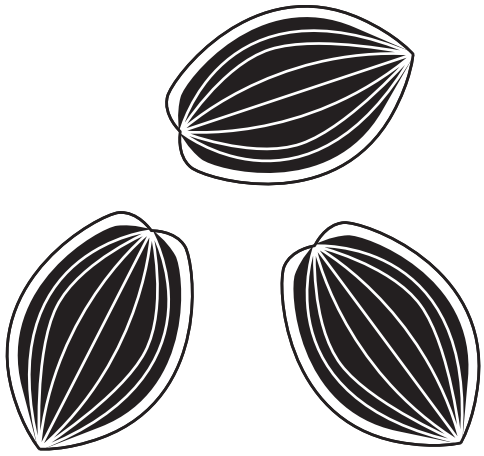
GATHERING GAME CARD



Mint

Gain **2** Survival Stones

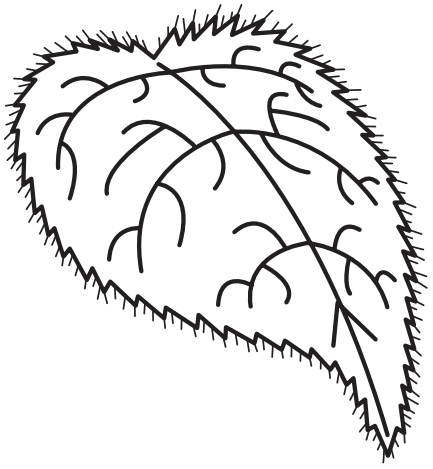
GATHERING GAME CARD



Sunflower Seeds

Gain **2** Survival Stones

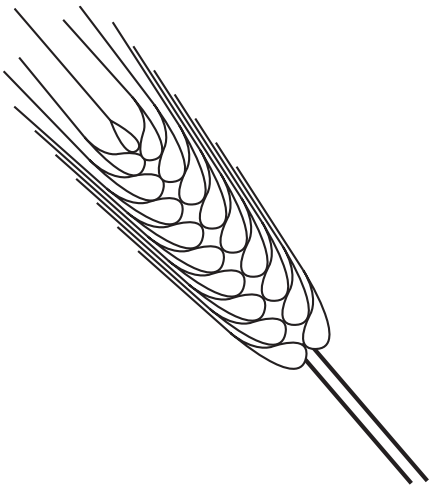
GATHERING GAME CARD



Nettles

Gain **2** Survival Stones

GATHERING GAME CARD

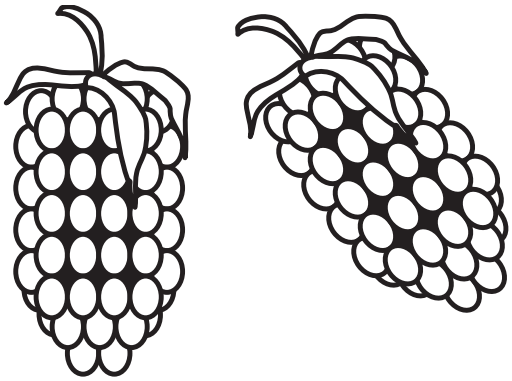


Wheat Grains

Gain **2** Survival Stones

GATHERING GAME CARDS - 3

GATHERING GAME CARD



Blackberries

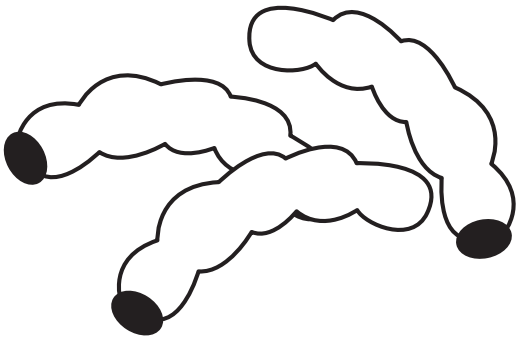
Gain **2** Survival Stones

GATHERING GAME CARD

Edible Roots

Gain **2** Survival Stones

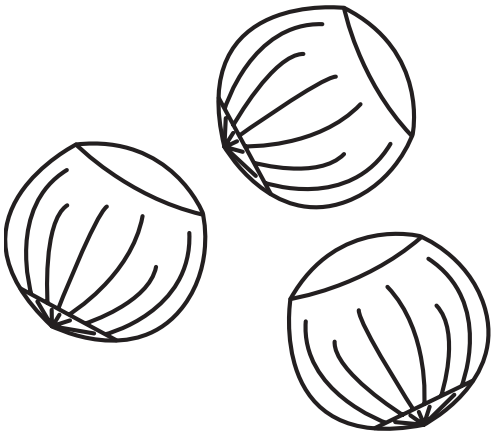
GATHERING GAME CARD



Grubs

Gain **2** Survival Stones

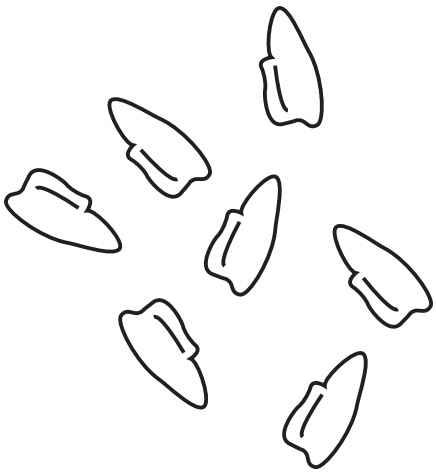
GATHERING GAME CARD



Hazelnuts

Gain **2** Survival Stones

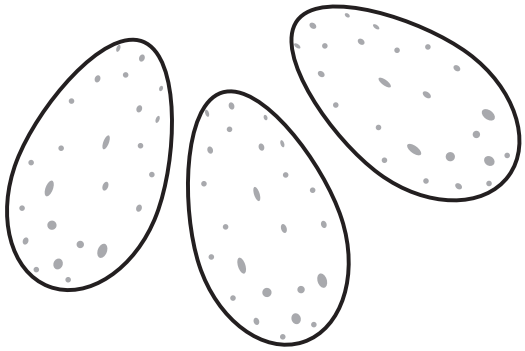
GATHERING GAME CARD



Fenugreek

Gain **3** Survival Stones

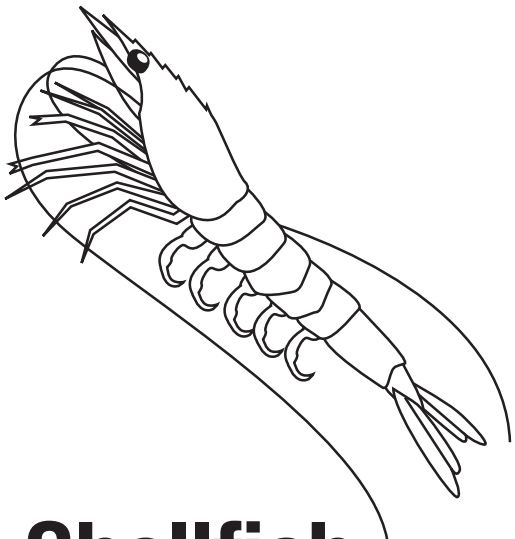
GATHERING GAME CARD



Quail Eggs

Gain **3** Survival Stones

GATHERING GAME CARD



Shellfish

Gain **3** Survival Stones

GATHERING FATE CARDS - 1

GATHERING FATE CARD

A few grasses and leaves thought to be nutritious and tasty turn out to be bitter and make several band members violently ill. One dies. Your foraging skills are now suspect, and you worry about your band.

Lose **2** Survival Stones

GATHERING FATE CARD

Two young women, cooking for the first time, burn the meal and bring bad luck for tomorrow's search for edible plants and small game. Band members have been hungry for several days now.

Lose **1** Survival Stone

GATHERING FATE CARD

Two hunters scald their hands while taking meat from a spit, but your women have horsemint flowers and leaves to rub onto the hunters' scalded spots. The salve has the power to ease pain and to heal.

Gain **2** Survival Stones

GATHERING FATE CARD

Your medicine woman, so expert at diagnosing ailments and using herbs and plants to heal them, suddenly dies, leaving your band with an inexperienced 12-year-old girl to take her place. Ouch!

Lose **3** Survival Stones

GATHERING FATE CARDS - 2

GATHERING FATE CARD	GATHERING FATE CARD
One of the women discovers a perfect cave, until now hidden from other band members' eyes. Your band will be able to store and keep safe all your cooking and healing items. Band members are happy.	The Goo-Bur, your spiritual leader, recovers from a fever. Pleased with the power of a medicine concocted from the willow plant, the Goo-Bur blesses the spirit world's power and then prays for the band's future.
Gain **1** Survival Stone	Gain **3** Survival Stones

Making A Fire Without Matches

Introduction

Understanding the mystery of fire and learning to master fire played a significant role in prehistoric human development. *Homo erectus* likely used fire over one million years B.P. Of course, no one knows how a particular hominid species captured fire or when this event occurred. We do know, however, that fire transformed life for hominids when it became an awesome tool and not a feared and destructive force.

"

… warmth
... defense
… cooking …

extending
the day …
exchanging
ideas orally
around
a hearth …

"

The advantages of mastering fire are many: for warmth, for defense against large predators, for cooking food into a more digestible form with less bacteria and fewer parasites, and for extending the waking hours into the night within the dark caves. With these extra hours, band members could exchange ideas orally around a hearth whose warmth encouraged speech and language development.

Today fire is controlled rather easily. Matches and lighters provide a portable and convenient way to have instant fire. But matches were not invented until 1500 years ago, probably by the Chinese. Prehistoric people had to start a fire literally from scratch. With the physical evidence scholars have found, we can imagine ways hominids started and used fire, once they were able to harness its fearsome natural force.

Fire without matches Method 1

The most challenging method of starting a fire involves the striking of flint with another kind of stone. When flint is struck with steel (a modern alloy-blended materials) or with iron pyrite (a stone composed of iron and sulfur) the friction often generates a spark. If this spark is generated over some tinder (soft, dry straw, shredded bark, or other easily flammable material), fire can result.

Materials and procedure

- flint
- iron pyrite or an iron file
- a nest of loose cotton or linen fabric strands to catch the spark
- Strike the flint and file.
- Blow the spark onto the nest.

Homo erectus likely used this technique to provide warmth around his hearth.

Making A Fire Without Matches

> "… rub them back and forth for seven to ten seconds ..."

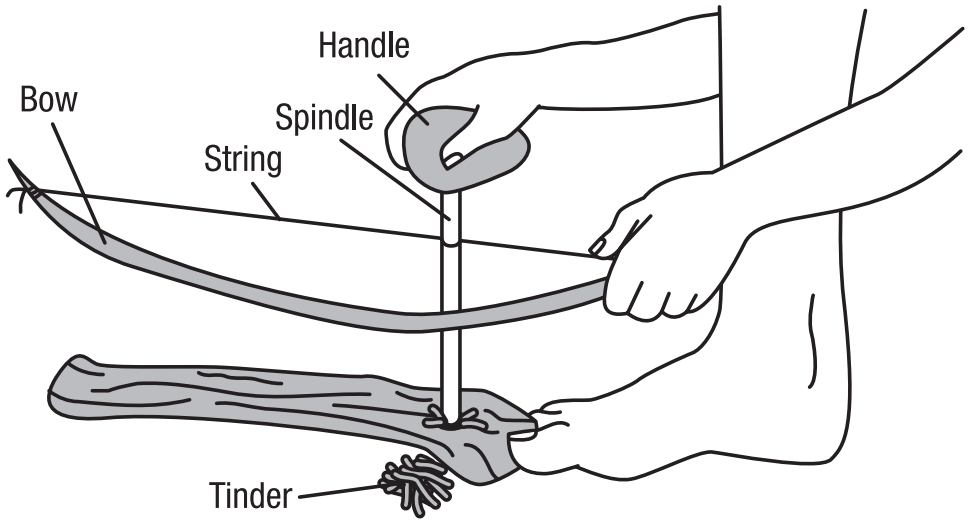
Fire without matches Method 2

Another common method of starting a fire, and one slightly more sophisticated and reliable, is the fire-by-friction technique. If you place your palms together and rub them back and forth for seven to ten seconds, the heat you generate will help you understand this simple concept. The same principle is applied to two sticks. To start a fire this way, begin by putting together this kit:

Bow-drill fire-starting kit

- a 12"×3/4" round wooden spindle with two rounded ends.
- a 3"×6"×2" wooden fire starting block with a hole carved/drilled partially into it to accommodate one end of the spindle
- a 2"×3" wooden crank or turner (handle) with a hole carved/drilled into it for the other end of the spindle
- a bow of 18" to 24", strung with a piece of strong cord, string, thong, or shoelace.
- a nest of tinder (cotton, linen, shredded bark)

Using the bow-drill kit



1. Place the fire-starting block under the spindle, making sure some tinder lays across or near the block.

2. Twist the bow-string around the spindle once.

3. Make sure you have water, sand, or dirt close by. Assume that you will start a fire and will need to put it out. *All this is done, of course, with an adult supervising your experiment.*

"... few humans are successful the first

time, even Eagle Scouts ..."

Making A Fire Without Matches

4. Hold the spindle upright with the spindle handle in one hand.

5. Press down on the spindle handle and turn the spindle with long, steady strokes of the bow, which is held firmly with your other hand.

6. Continue until friction produces some smoke.

7. Keep up the procedure until small flames indicate the nearby tinder is lit. Be assured that few humans are successful the first time, even Eagle Scouts, and this includes prehistoric humans who used this technique almost on a daily basis.

Summary

You might want to try to start a fire using one of these two methods. A third, utilizing a magnifying glass and the sun's powerful rays, probably wasn't a popular option in the Stone Age. All three techniques, by the way, are described in *The Boy Scout Handbook*, 10th Edition, 1990, pp. 90–93.

A cautioning comment once again: If you attempt this experiment as a Stone Ager, have an adult supervising you. And, of course, have either water, sand, or dirt nearby to extinguish the fire until it is Cold Out!

Finally, how would you answer the question that accompanies the illustration below?

In what ways would our lives be different if fire were not in our lives?

Making and Demonstrating a Spear-Thrower

> "… gave some lengthy distance between the hunter and the hunted ..."

Introduction

Of all the advances in Stone Age technology, no invention had more impact on human survival than the spear and spear-thrower. The spear itself, ranging from the pointed wood stick of *Homo habilis* to something much more sophisticated used by Cro-Magnon, gave some lengthy breathing distance between the hunter and the hunted. This distance was especially important if the animal was large and fast (e.g., lion, bear, mammoth, bison). A narrow wooden stick five and one-half to six feet long with a deadly flaked flint spearhead attached on the end allowed the hunter to hurl or launch the weapon perhaps 50 to 70 yards, with a killing range of 15 yards or so.

The invention of a spear-throwing device, an 18" to 24" piece of antler, bone, or wood, hooked or clipped onto the back end of the spear improved the leverage exerted as the hunter's arm thrust the spear forward. With it, the weapon most often would be catapulted harder and farther, up to 150 yards, with a killing range of about 30 yards. This throwing device doubled the effectiveness of an unassisted spear toss. A well thrown spear could bring down the animal before it smelled human scent, became scared, and ran away. In effect, the centrifugal force generated by the snapping of the hunter's wrist accounted for the increased distance.

"More distance! Better accuracy!" Flint raves to Piff about his new spear thrower.

Materials needed to make a spear and spear-thrower

The spear

- a 5.5' to 6' wooden broom stick, piece of wood, or bamboo
- a small weighted and blunted spearhead, a small weighted sack tied to the stick, or a piece of old tire tied to the stick as a spear point
- twine or heavy string with which to tie the spearhead to the spear pole

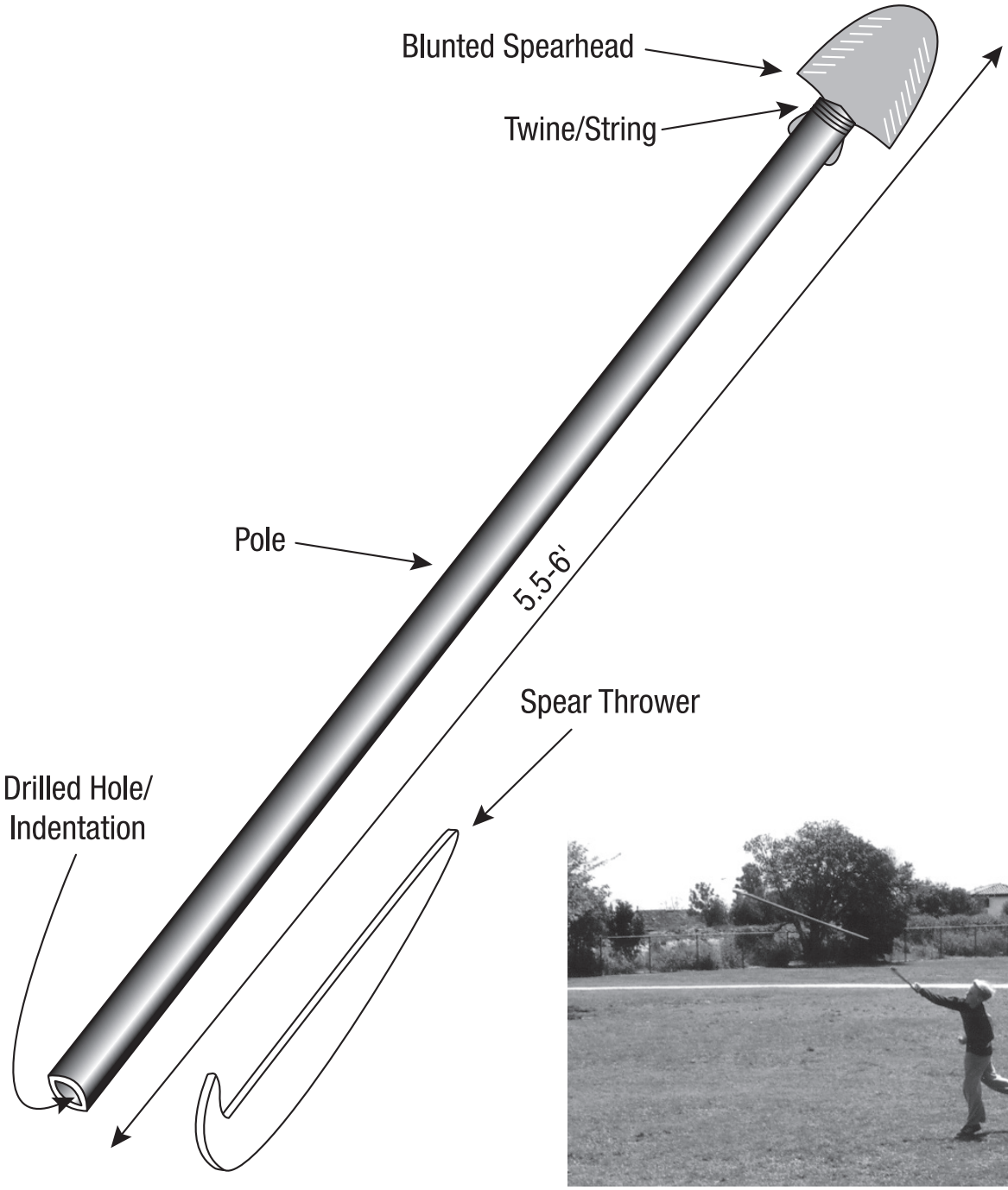
The spear thrower

- an 8" to 24" hooked piece of wood to use as a spear-throwing device
- a 6" to 8" piece of leather/fabric strap/ thong/ handle for the spear throwing device (optional)

Making and Demonstrating a Spear-Thrower

Making the weapon

1. Carve or drill a small hole or indentation in the back (haft) end of the long wooden spear so the spear thrower hook can fit into it.
2. Make or carve an 18" to 24" piece of wood (the radius of the hook could be slightly smaller than the spear's) with a protruding hook at one end.



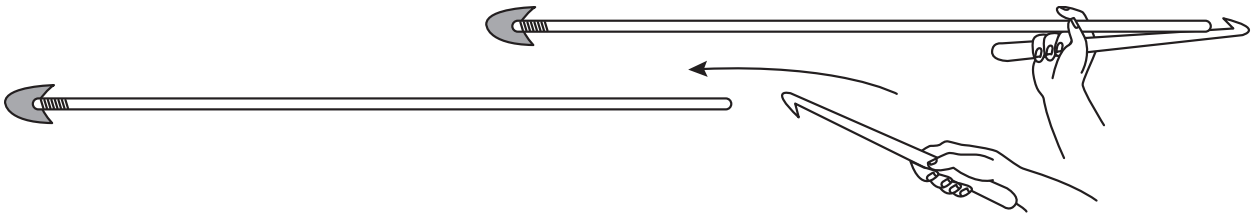
Just in case Piff is skeptical, Flint demonstrates the spear thrower's potential in bring down fresh meat.

Making and Demonstrating a Spear-Thrower

Demonstrating the spear-thrower

One or more students will be assigned or will volunteer to find the materials, make the weapon, and practice outside school time before they demonstrate it one day for all students.

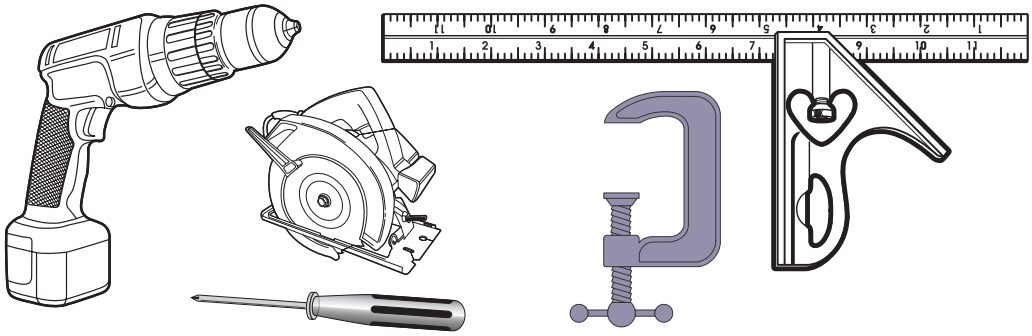
***Note well**: Following **teacher and parent approval**, **teacher and parent supervision** will take place during **all practices** and **all performances** on the school's athletic field.*



1. **Note well:** Ensure that no person or animal is within 100 yards of your practice session tosses.
2. As you throw the spear, whip the spear forward while hanging on to the leather handle (if you choose to use this apparatus) which is attached to the spear-thrower.
3. Practice! Practice! Practice!
4. **Note well:** When you demonstrate your tosses for all Stone Agers, be outside (of course), have all witnesses behind you, and then toss the spear a few times without the spear-throwing device before tossing the spear with the device.
5. Finally, if you have mastered the techniques adequately, your teacher may allow you to teach other students to use the spear-thrower—*but only in your teacher or parent's presence. Remember, this was an effective weapon capable of killing large animals. Use your skills wisely and carefully.*

Introduction

Walk through a modern hardware or appliance store, and you'll see the most amazing array of sophisticated tools you could imagine.



Nail guns, cordless drills, blenders, and electric knives are the results of experiments in technology that began somewhere millions of years ago when the idea for a tool to scrape an animal carcass flashed into the mind of an early hominid.

> … the first flint chip used for cutting ...

"The mother of all inventions"

Recognizing the impact of tools, paleontologist Richard Leakey called the first sharp flint chip used for cutting "the mother of all inventions." Of course, we don't know which hominid put stone to flint to create such a marvel, but it was probably the species *Homo habilis*. What we do know is that this singular act left a deep impact on prehistoric technology as hominids advanced toward civilization. Likewise, Kenneth Oakley, in his book *Man the Toolmaker*, wrote that "man made tools and tools made man."

Australopithecus

We can only conjecture as to what kind of tools *Australopithecus*, the first hominid, came up with. Perhaps a sharp or heavy stone or two hurled at an animal was the extent of the toolmaking skills of these primitive hominids. Yet some sources indicate they may have used animal jaw bones for scraping, and branches and sharp animal bones as weapons for hunting.

Homo habilis

Certainly using the experience of an earlier species, *Homo habilis* made the first "pebble tools" or "chopping tools." They were simply made by hammering a small stone or pebble against another larger rock or striking it with a "hammer stone," thus chipping away flakes and leaving a sharp edge. Because *Homo habilis* was predominately a scavenger, these "choppers" were most likely used to cut up carcasses of animals already killed by larger predators. The sharp flakes which were knocked off during the making of these tools were probably used for cutting and slicing.

"

... more varied and sophisticated tools were used ...

"

Homo erectus

With the arrival of *Homo erectus*, more varied and sophisticated tools were used. A simple flint hand axe had a two-sided cutting edge, much sharper than the primitive "choppers." Although primarily used for butchering animals, this hand axe was probably also used as a digging tool. Eventually, improved toolmaking techniques produced rasps and knives. Bone and wood used to shape stones resulted in thin flakes which were better cutters than the earlier hand axes. In addition, *Homo erectus* used as weapons wooden spears with points hardened by fire's heat. Perhaps, as the Leakeys have suggested, *Homo erectus* also used a bola as a weapon to hurl smooth round stone balls at their quarry.

Homo sapiens

Millennia later Neanderthals needed and utilized an even greater variety of tools. Better tools manufactured from flint included side-scrapers to prepare animal skins for clothing and shelter; borers and piercers for making holes in skins; points, knives and notched wood-sharpeners to sharpen spears.

"

... the artistic talents of these clever people.

"

Cro-Magnon's tool kit was the most complete of early humankind. Superior craftsmanship, more specialized tools, new weapons and other devices characterize Cro-Magnon's achievements in toolmaking technology. He used a burin (a kind of chisel) to make other tools. Finely worked implements such as needles, points, and awls were made from bone, antler, and ivory, materials little used by earlier hominids. The addition of carved bone and antler handles on tools demonstrates the artistic talents of these clever people.

Also created during this time period were heavier work tools such as antler picks and mammoth leg bone shovels. Spatulas, scrapers, beads, bracelets, and digging tools were among the many domestic items produced by Cro-Magnon, while spear points, arrowheads, lances, and harpoons expanded the Cro-Magnon arsenal of weapons. Furthermore, an innovative device invented by Cro-Magnon, the spear-thrower, enabled the hunter to kill his prey from a greater distance. Along with hunting technology, Cro-Magnon people developed specialized fishing gear to expand their food supply. The *leister* was a three-pronged fishing spear that secured the catch. Another device, the *fish gorge*, was a sliver of bone or wood with a line attached around the middle. When the fish swallowed the device, it lodged sideways in the throat, and the fish was hauled out of the water. Traps, stone weights, and nets were also used. Thus, the variety and greater effectiveness of these tools made Cro-Magnon the master toolmaker of early humans.

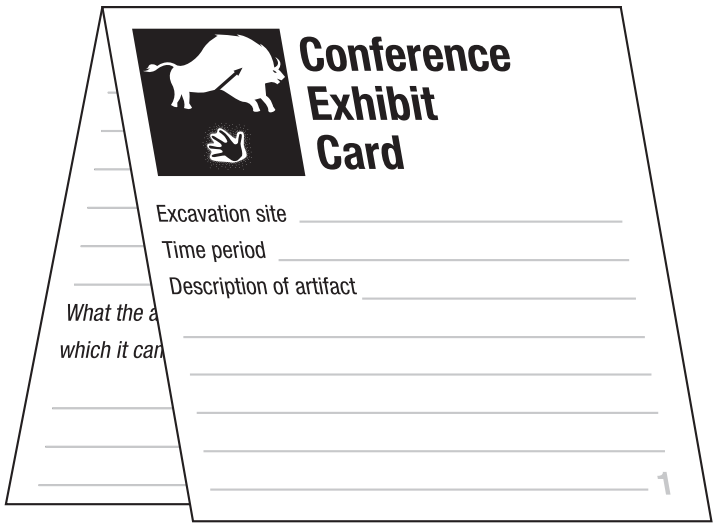
PREHISTORIC TOOLMAKING ASSIGNMENT

1. **Use your imagination:** Pretend you are living during the Stone Age. Realize that none of the modern luxuries surrounding you in the twentieth century are in existence.

2. **Select a useful tool:** Your task is to select an item or implement—tool, basket, pottery, clothing, etc.—that would be useful to early humankind.

3. **Go outside and search:** Once you have decided what you will make, go outside and search out the necessary raw materials to manufacture your tool. Since this is the Stone Age, you may not use any modern tools that are made of metal, or any modern tools for that matter. You may not use any man-made materials or purchased materials. You may use only natural materials such as stones, bones, wood (not lumber), branches, leaves, grass, reeds, straw, bamboo, shells, twigs, berries, etc.

4. **Catalog your creation:** After completing your tool, complete the CONFERENCE EXHIBIT/EVALUATION CARD. Be sure to draw a picture of your invention and carefully describe the benefits and advantages provided by your invention.



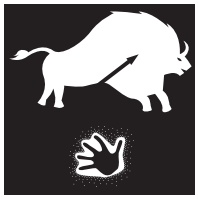
5. **Save your invention and CONFERENCE EXHIBIT/EVALUATION CARD:** Later during Passage ~~III~~ I: Conference, you will place this card next to your artifact on display.

6. **Get ready to present:** Finally, as Passage ~~III~~ I: Conference approaches, practice your role as a paleoanthropologist and prepare an oral presentation describing your prehistoric tool. Your university colleagues will be anxious to hear what you have to say about your toolmaking discoveries. Therefore, prepare yourself to speak authoritatively and enthusiastically about how you made your prehistoric tool.

Good luck!

CONFERENCE EXHIBIT/EVALUATION CARD

Conference Exhibit Card



Excavation site _____

Time period _____

Description of artifact _____

_____

_____

_____

_____

_____ 1

Sketch of artifact

Use of artifact

_____

_____

_____

_____

_____

_____

What the artifact tells us about the hominids from which it came

_____

_____

_____

_____ 3

Evaluation Card

Name _____

Date _____ Period _____

Evaluation (Circle **1** **2** or **3** and total the Survival Stones.)

- Creativity/Craftmanship **1** **2** **3** Stones
- Effective use of natural materials **1** **2** **3** Stones
- Quality of presentation at the conference **1** **2** **3** Stones

Total Survival Stones awarded _____ 2

Directions:

1. Carefully cut out—just outside the lines—this card which has four numbered panels.
2. You are now ready to fold this sheet into a small CONFERENCE EXHIBIT / EVALUATION CARD.
3. First fold across the vertical broken line.
4. Take the folded piece and fold it again, this time horizontally.
5. You now have your correctly folded CARD.
6. Fill out all panels except #4. Your teacher will fill out this last panel.

NOTES

INTRO, FLOURISHES, AND SETUP - 1

> “… it’s time for them to go forward …”

Introduction

Passage III: Language, focuses on one very important change in the long human journey, the origin and development of speech or oral communication. Now that your Stone Agers in their bands have learned and practiced the rudiments of basic survival, it’s time for them to go forward with something that makes us uniquely human—the ability to convey thoughts in words about things important in our lives, to give names to items such as mountains, water, mother, car, and to give labels for concepts such as love, angry, beauty, etc.

The essay ORAL LANGUAGE DEVELOPMENT prepares bands to use invented words, phrases, grunts, gestures, and body language to create brief scripts given them as LANGUAGE SCENARIOS. Enjoyable learning comes after each performance when others at this clan gathering try to interpret what they have seen and heard. Added to this passage are CAVE COURT CASES, during which representatives from each band use infinite wisdom to offer solutions to problems and to mete out punishment that might have come up in any prehistoric society.

Flourishes

1. A week before this passage begins, video tape a current popular TV sitcom. Showing about 10 minutes *without sound* to your students on Day 1 will demonstrate how important gestures, body language, expressions, etc., are to people trying to communicate in a language unfamiliar to the listener.

2. Your classroom may be inadequate for rehearsing the scripts for the Language Scenarios. Since there is some secrecy necessary for the invented words, gestures, grunts, and body language, a larger room, or a few rooms and a hallway or corridor might be more appropriate to ensure closed rehearsals. In a pinch, your classroom will make do, as always.

3. Change your venue for the Cave Court activity at the end of the Language Scenario performances. A perfect place would be outside your classroom, in a remote corner of your school athletic field, or in a small amphitheater in your school. While you do this activity, band representatives, who will probably be each band’s leader, will stand in front with the Great Goo-Bur. Have all other students sit on the floor or ground Native American style. Allow some extra room in front for each band to come forward to present its case. Band representatives could be elevated on some drama risers to give them authority.

Teaching Tip →

Where you decide to stage the Language Scenarios and the Cave Court cases may significantly impact their success. Try to find venues outside your classroom.

Teaching tip

A short snippet from **The Flintstones** *might do nicely. Remember: do not have any sound.*

It may be most beneficial for your students if you use a display copy of the SCENARIO INTERPRETATION FORM or put its questions on the board and lead a class discussion following each scenario presentation.

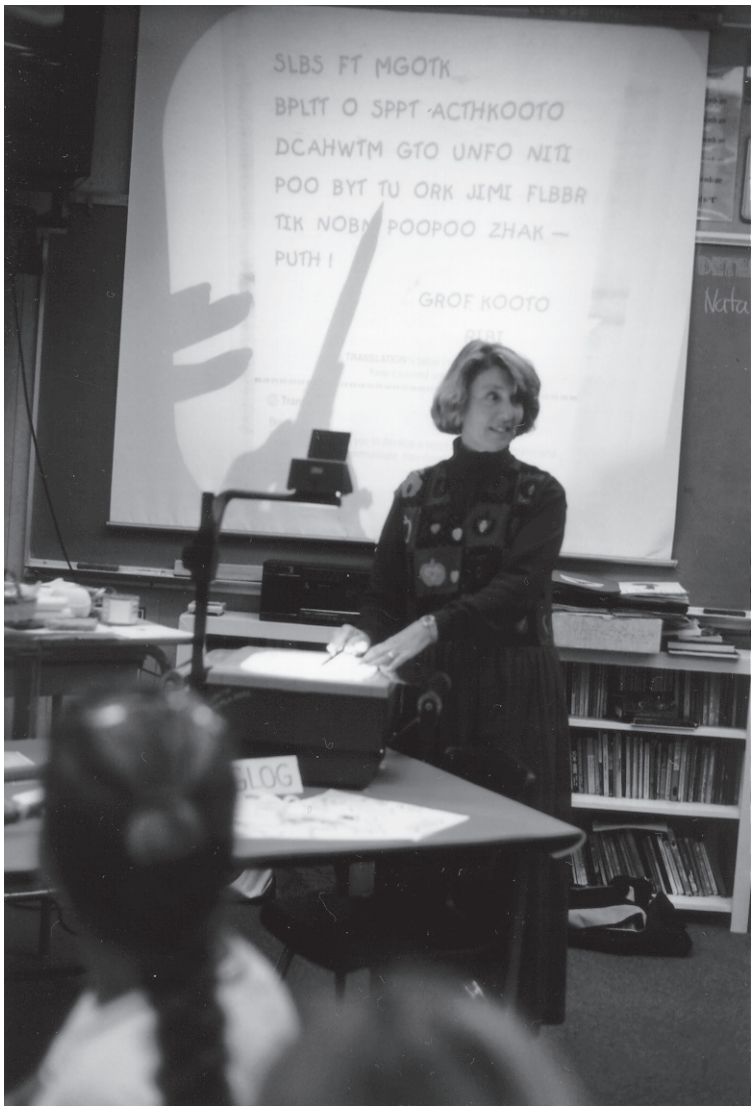
Materials

- Index cards (5"×8")—*13*
- Paper strips numbered 1 to 7
- Video tape of a TV sitcom—*one (see Flourishes #1, page 3:1)*

Duplication

Duplicate the following **Master Pages** (type and quantity in *italics*):

- SLBS FT MGOTK—*display copy*
- ORAL LANGUAGE DEVELOPMENT—*class set*
- GUIDELINES FOR LANGUAGE SCENARIOS—*class set or one per band and/or display copy*
- LANGUAGE SCENARIO PLAN—*one per band*
- LANGUAGE SCENARIOS—*one per band*
- SCENARIO INTERPRETATION FORM—*class set or display copy*
- THE GREAT GOO-BUR—*one for student who plays the Goo-Bur*
- CAVE COURT CASES—*one set per band*



Author Barbara Lacey discusses the importance of gestures and facial expressions in reading GIBBERISH as she motivates her students in a pre-oral language activity.

DAY 1: MOTIVATORS AND LANGUAGE SCENARIOS PLANNING

1. If you haven't awarded Survival Stones from Passage II: Survival, do so now. It might heighten band competition at this point to subtotal band Survival Stones treasures, for they've completed two Passages and have four Passages to go.

2. Either written on the white board or presented on the projector, display the SLBS FT MGOTK gibberish letter from you and allow time for students to read it.
   a. If you use the transparency, be careful not to let students see the translation at the bottom. They won't have a clue, of course, when you ask them what the gibberish letter says.
   b. Now try reading it to them using your vivid expressions, gestures and holding up some of the handouts they'll use while writing their scripts on oral language development.
   c. If they listen and watch closely, some will pick up the essence of the letter, maybe even a few words.
   d. Lead students to notice the importance of your gestures, facial expressions, body language, and use of visuals, even when the words are unfamiliar and gibberish. This little motivator will help them interpret the scenarios coming up.

Teaching tip →

Be dramatic as you read this gibberish letter, as if you were a stage actor or silent film star—with outrageous, exaggerated expressions and gestures.

3. Following the gibberish letter, show a 10-minute snippet from a popular TV sitcom—*without sound.*
   a. As it plays, make comments or ask questions about gestures, body language, and facial expressions.
   b. Afterward, hold a brief discussion on the difficulty of interpreting a foreign language.
   c. **Option**: If you have two witty, fast thinking students, ask them to make up dialogue to match what's being mouthed by the TV actors as it actually happens on the screen during a replay.

4. To reemphasize the lessons of #2 above, make up 5"×8" cards with words such as these on separate cards:

Rage	**Joy**	**Surprise**
Sadness	**Thoughtfulness**	**Disappointment**
Hilarity	**Love**	**Shock**
Hope	**Frustration**	**Panic**

   a. Without letting the rest of the class know, hand out these cards to selected students, those with a dramatic flair, or perhaps involved in your school's drama program.
   b. Have these students come forward one at a time to express or act out the emotion that matches the one word on his/her card.
   c. Have the rest of the class try to identify and write down which emotion these students are expressing.
   d. Afterwards, have a discussion based on what students wrote down and whether they were accurate.

e. Again, this motivator will help students focus on and become excited about the larger activity on oral language development to come. Further, it should encourage them to learn to exaggerate their gestures and sharpen their performances.

5. Having used one or more of these motivators, hand out ORAL LANGUAGE DEVELOPMENT. This background essay is a foundation upon which students can build an understanding of one of our most intriguing and unique human attributes—speech. Choose how best to cover this primer on oral communication among humans and primates. Emphasize key points in the essay.

"Make it clear what students are to do."

6. Hand out GUIDELINES FOR LANGUAGE SCENARIOS or display a copy and discuss the various points and requirements. *Make it clear what students are to do.*

7. Hand out the LANGUAGE SCENARIO PLAN.
   a. Explain how they are to fill it out.
   b. Next, have one representative from each band come forward and pick a number from 1 to 7 from a container. Distribute the scenario cards to match the numbers picked.
   c. Each band should read the scenario secretly, then, using the LANGUAGE SCENARIO PLAN, carefully decide how to act out the scenario.
   d. Make sure that you emphasize the importance of working in secrecy during the entire preparation time. The scenario's plot, characters, and setting must be kept secret from all of the other bands. If other band members overhear the plans, the success of the band's performance will be blunted, perhaps even ruined.

Teaching Tip →

Your assignment of students to the different bands will affect how well each band completes its scenario performance. Each band should include students with leadership and performance capabilities, if possible.

8. Let band members work on their LANGUAGE SCENARIO PLAN the rest of the period, perhaps making student band leaders show you just before the passing bell what they've accomplished/produced during the time allotted.

DAYS 2–3: SCENARIO PLANNING AND REHEARSING

1. Review the LANGUAGE SCENARIOS assignment and what you expect all bands to accomplish.

Discourage the use of props, as this will lessen student performers' reliance on their vocabulary and body language as communication tools.

2. Allow students the full class period, and maybe the next to write, polish, and rehearse their scripts. The amount of class time allowed for working on the LANGUAGE SCENARIOS and rehearsing the presentations will depend on several factors, one being the ability of your students. Keep in mind, the investment in time for preparation will probably pay off in better performances.

DAY 3 OR DAY 4: SCENARIO PRESENTATIONS AND EVALUATION

Teaching tip

Inform students that you expect them to produce a script that will eventually result in four to five minutes of poignant drama or outrageous comedy.

1. Before starting the presentations:
   a. Tell all students what you expect from them. Explain why you have high standards for this activity. Point out how you expect them to follow all instructions and guidelines.
   b. We recommend that you post on the board the SCENARIO INTERPRETATION FORM. Students may take notes on each band's performance on their own paper. Alternatively, you may distribute copies of the SCENARIO INTERPRETATION FORM to each student for use in evaluating other bands' performances.

We have found our students tend to rise to our expectations. A wise mentor teacher told us several times: "Students will 'buy' a cheap education if that's how we sell it; but if we sell an expensive product, students will want to buy an education that has quality and real value."

2. There is no need to proceed in any particular order, so you decide the sequence—random or perhaps ask for volunteers. Before performances begin, make sure there is enough cleared space in the front of your classroom for actors to emote. The first group—and those that follow—should give you their PLAN sheet and … after a signal from you, start their performance.

3. At the conclusion of the first band's performance, encourage everyone else to applaud. Then proceed to discuss the questions on the SCENARIO INTERPRETATION FORM. See if, indeed, the audience was able to figure out the actions, gestures, and invented words of the band.

After some discussion from the audience, have the band leader read his or her band's scenario card aloud to see how close the audience came to deciphering the real situation.

4. With this pattern established, continue through the rest of the bands until all have presented. If you choose, single out the best performance by one of your bands. Review why you reached your conclusion. Refer to the ORAL LANGUAGE DEVELOPMENT essay and highlight some of the points made, especially the importance of gestures, body language, and even grunts to communicate.

Members of the Water Band use gestures and a fabricated language to act out in front of the entire clan their scenario card in which one unfortunate hunter heads for the unseen spirit world.

5. If you have time and feel the need to award Survival Stones for the better performances, do so now.

6. If you plan on implementing the Cave Court activity, select one student to be the Great Goo-Bur and give him/her a copy of THE GREAT GOO-BUR and one copy of all the CAVE COURT CASES.

DAY 4 OR DAY 5: CAVE COURT SOCIAL DILEMMAS

Teaching tip →

Encourage the Great Goo-Bur to put together a costume, perhaps with a wig, robe, spear, etc.

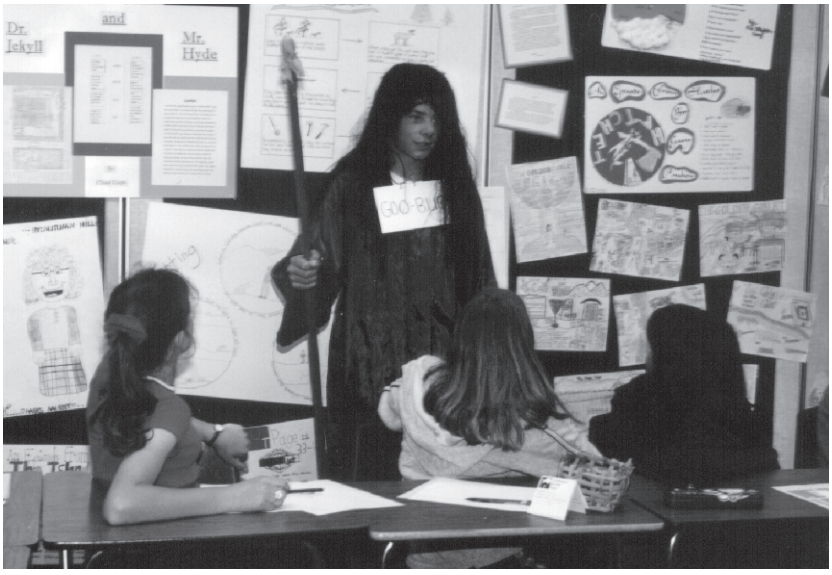
Have students imagine how they would deal with someone in their band who violated a rule or tradition when there is no formal enforcement agency or justice system to handle the situation.

1. If you have an especially verbal and active class of students, this Cave Court activity will give them further opportunities to shine and learn more about Stone Age life.

2. Before you introduce this activity, take a copy of the CAVE COURT CASES and fill in the names of individuals to be the accused and note to which bands they belong. Select one person from each band, but do not announce their identity. Select students who are usually in class, and strong enough to speak up for themselves in court. Give a copy to the Great Goo-Bur before court opens.

3. Distribute one set of CAVE COURT CASES to each band, and read together the instructions and all of the situations.
   a. Assign each band a specific CAVE COURT CASE to discuss and analyze in depth. This will be the case corresponding to the case in which their band member will stand as the accused.
   b. The Great Goo-Bur should be reviewing his/her information, with the identities of the accused, in preparation for presiding over the presentations and solutions of each of the cases.

4. Once the bands have read and analyzed their particular cases, have each band send one representative (probably the band's leader) to the front to help the Great Goo-Bur come up with solutions for these cases. Each representative will read aloud the case his/her band has analyzed.



With fanfare and skill, the Great Goo-Bur dispenses justice and wisdom as one of the provocative Cave Court social dilemmas plays out.

5. Introduce the Great Goo-Bur with some fanfare, emphasizing his/her skill with magic, healing, and meditation grounded in the infinite

Teaching Tip

If you make the identity of the accused a surprise, hopefully this will generate some additional drama and spontaneity.

wisdom which only a shaman can possess.

6. Then let the Great Goo-Bur carry the responsibility of guiding the clan through the seven cases, using this sequence:
   a. The case is read aloud by a band representative.
   b. The Great Goo-Bur calls the name of the accused individual from that band.
   c. The Great Goo-Bur asks the accused to explain why the act was committed and then to defend him/herself. (The accused will be somewhat prepared for this defense based upon the discussions held within the band during the analysis period.)
   d. The Great Goo-Bur asks for comments from within the band and then from anyone from other bands at the clan gathering.
   e. Once the case has been discussed, the Great Goo-Bur asks the council of band representatives to discuss what should be done.
   f. After this brief discussion, the Great Goo-Bur asks his representative council to vote on the guilt or innocence of the accused.
   g. If the accused is found innocent, the Great Goo-Bur releases him or her. If the accused is found guilty, the Great Goo-Bur should survey the gathering for a punishment. Having listened to these ideas, the Great Goo-Bur and the representative council vote on the recommended punishment by clenching a fist and holding it in front of their chests. If the vote is "yes," the fist goes up and down; if the vote is "no," the fist is moved laterally.

Be sure that the Great Goo-Bur has done his or her preparation work before going forward.

Again, the authors acknowledge the creative mind of Jean Auel in **The Clan of the Cave Bear** *for some of the flourishes in this Cave Court Cases Activity.*

7. Debrief your class with some questions or comments on the kinds of dilemmas facing primitive humans and how they probably resolved their problems.

8. You should be able to complete all seven Cave Court Cases in one class period. If not, complete as many as possible, selecting cases based on the details that come from a few of the more controversial or interesting situations.

9. If you wish to award Survival Stones to participants for what they've done in this activity, do so at this time.

SLBS FT MGOTK
BPLTT O SPPT ACTHKOOTO
DCAHWTM GTO UNFO NITI
POO BYT TU ORK JIMI FLBBR
TIK NOBN POOPOO ZHAK—
PUTH!

GROF KOOTO
RIBI

KEEP THIS **TRANSLATION** COVERED UNTIL …

Translation:

Boys and Girls,
Soon I will ask all of you to develop a script about early humans and how, struggling to communicate, they developed oral language—speech!

Thank you,
MS./MR.

ORAL LANGUAGE DEVELOPMENT - 1

"… honey bees apparently dance

on a honeycomb to point out distance …"

"… we have the required anatomical equipment …"

Animal language

One of the essential traits that make us humans truly human is our ability to communicate not just words but ideas. While lower animals do have systems of communication, what humans do with oral language goes far beyond other species; because of our oral language, we are able to reach a higher and more complex level of social relationships, organization, and thought than other species. All around us, we can study how other animals communicate within their own species. Some of these ways are unique and intriguing. For example, honeybees apparently "dance" on a honeycomb to point out the distance, direction, and nature of a potential food source. Dogs use scent, barks, howls, and growls to communicate with other dogs.

Primate communication

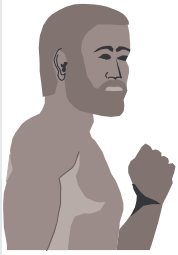
Non-human primates also have an intricate system of communication. Monkeys, and especially apes and chimpanzees, besides some vocalization, rely heavily on gestures, facial expressions, postures, sounds, and scents. Some of these reflect shades of meaning not seen in less complex animals. Primates, for example, will give a shriek to companions if danger is sensed; they will also let out a cry to alert other primates of pleasure. On occasion, primates use wordless gestures and body language to display moods, feelings and intentions.

Phonetic codes

Communication among humans, of course, goes much, much further. Primates can neither name specific items nor speak thoughts through a complex phonetic code we call words; nor can primates refer to past or future events or use words to communicate symbolic meaning. Only we humans have the ability to speak to each other on such a high level. Part of the reason for this ability is we have the required anatomical equipment: the ideal position of a larger larynx (voice box) in the throat; a larger, thicker flexible tongue; and a more developed region in the cerebral cortex of the brain. All these working in combination effectively process associations and memories of pictures and words.

Early hominids

Of course, we cannot come remotely close to pinpointing when prehistoric humans began to use oral language as a tool of communication. After examining the fossilized skulls and upper skeletons, paleoanthropologists believe that *Homo erectus* was probably the first ancestor to "talk," that is, to orally share thoughts with others, and this ability evolved over the million years or so of *H. erectus* existence. Before erectus, *Australopithecus* and *Homo habilis*, the first hominids, were limited to grunts, gestures and signals, if that.



"Meat"

Baby talk?

If somehow we were able to be present for conversations around a hearth inside a cave 2 million years B.P. as a band of *Homo erectus* communicated, we would think we were hearing young children talk. Sentences would be short, often without what we call verbs, adverbs, and adjectives. There would be endless hand signals, facial expressions, gestures, grunts, and body language nuances. Single words such as *hot*, *baby*, *stone*, *meat*, or *water*, combined with a hand gesture or two probably communicated an idea or need very effectively without too much elaboration.

Neanderthals speak

One must imagine that the species *Homo neanderthalensis*, probably evolving from a branch of *Homo erectus* nearly 1 million years B.P., took oral language development further. A larger brain and larynx probably enabled Neanderthals to communicate better than their forebears. However, Neanderthals probably had not yet developed the vocal organs required for rapid, clear speech. They may have had a rudimentary grammar and somewhat limited vocabulary of words. Nevertheless, Neanderthal hunts especially, could be skillfully preplanned, and executed smoothly and with great success, using specific words to refer to past hunts and knowledge of their prey's habits of behavior. No doubt silent gestures and signals during the stalking phase of the hunt were utilized. In the novel and film *The Clan of the Cave Bear*, a weary Neanderthal band "discusses" the survival and adoption of a Cro-Magnon child by using hand signals, gestures, and short, choppy sentences.

"

In the novel and film The Clan of the Cave Bear …

"

Language changes early Homo sapiens sapiens

The evolution of human oral language allowed later hominids (specifically *Homo sapiens sapiens*) to progress beyond mere existence. Sitting around a hearth fire in a cave or man-made shelter must have sparked conversations about tomorrow's bison hunt, family relationships, Thog's death and afterlife, the colorful, beaded necklace Theena was making, or the detailed reindeer Hexor was painting on the cave wall. By the time of the emergence and dominance of *Homo sapiens sapiens* (called Cro-Magnon in Europe), culture had reached a point where people fashioned specialized clothing and tools, and organized their society and planned their hunts and rituals with a language complexity we associate with our species. Cro-Magnon people probably had a "robust" grammar and rapid speech, speaking a similar language with innumerable dialects all over the world.

Thus, the continual evolution of oral communication—from the primitive grunts and gestures of *Homo erectus*, to the discussions of Cro-Magnons on a possible after-life—took humans further into a world of abstract thoughts and the use of symbolic language that opened up a world beyond daily life and self-evident needs. Certainly Cro-Magnon people had begun thinking and communicating the ultimate questions that trouble human beings to this day:

"Where did I come from? Who or what put me here? Is there life out there on those shining, sparkling things so deep in the sky? Why do I care so much for certain persons when I don't care as much for others? Why must I leave this life and die? Since I am going to die, what should I do with my life while I'm here? When I finally die, where will I go? Is there life after death? Will I ever get to come back to this life in this place?"

GUIDELINES FOR LANGUAGE SCENARIOS

Your band will perform a dramatic LANGUAGE SCENARIO of a prehistoric situation using a language of words and gestures that your band members will devise.

Guidelines . . .

Follow these guidelines:

1. Invent **a 15–20 word vocabulary** appropriate to your assigned scenario.
2. Develop and agree on **several hand signals**, **gestures**, **grunts**, **and body language nuances** to communicate with one another. (For example, rubbing the stomach, rolling the eyes, licking the lips, and pointing to fruit on a tree presents a clear mind-picture.)
3. Using your newly invented language, skillfully **plan**, **rehearse**, **and perform a mini drama** based on your LANGUAGE SCENARIO. Other bands watching will be able to deduce the essence of the scenario—the relationship of the people in the scenario … the dilemma or problem within the scenario … and how these people resolve their dilemma. *(Listening and observing should enable your audience to figure out some, if not most of, the words and gestures your band has invented.)*
4. Be sure to use your Stone Ager names, not real names when speaking to others in your band during your scenario performance.

Here is a summary of your tasks:

Plan

1. Invent 15–20 words (no foreign language words/phrases allowed).
2. List and define the gestures and body language you will use.
3. Assign roles (who does what).
4. Sequence the events from your scenario, including a beginning, a middle, and an end (a rough script).
5. Memorize your invented vocabulary. (Possibly you'll want to make and use flash cards.)

Rehearse

- Staging
- Dialogue
- Movement
- Gestures

Perform

- Project voices.
- Exaggerate movement, gestures, etc.
- Stay "in character" at all times.
- Try to be believable and somewhat natural.

A final suggestion

Don't mention your scenario's title, theme, or ideas to anyone in any other band. Part of the fun and challenge is for your band members to communicate so well during your performance that members of other bands can really understand your scenario from your performance.

LANGUAGE SCENARIO PLAN

Band : _____

Role Player (Stone Ager Name)	Role	Gestures/Body Language

Invented Words	English Equivalent

Staging Ideas

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

(Cut on broken lines. Each band's scenario should be kept secret.) **LANGUAGE SCENARIOS** - 1

LANGUAGE SCENARIO 1: The hunt
Your band will be on a woolly rhinoceros hunt—stalking, attacking, and killing the massive beast so feared by humans but, thankfully for your hunters, heavy and slow of foot. Two of you are fearless, proud warriors; one is frightened of losing his life. This hunter would rather be in a safe cave practicing his artistic skill at painting the animal, not hunting and killing it on the open plain. Stalking the rhino provides opportunities for hand signals and gestures.

LANGUGE SCENARIO 2: Burial of a friend
Your band will bury a close friend/relative in a shallow grave. He lost his life to an angry cave bear whom he disturbed during the animal's hibernation. Invent a ceremony to accompany the burial, including a brief eulogy, ritual, and some discussion of your friend's soul going on in an afterlife for the dead. Some personal trinkets of the deceased might be placed in the grave with the inert body.

LANGUAGE SCENARIO 3: Gathering
Your band will all be gatherers—women, children, and elderly males (all the young men are away on the hunt). As you pick, forage, and gather clover, dandelions, wild grasses, mushrooms, nuts, berries, tubers, and seeds, you will discuss which plant foods might provide medicinal or therapeutic aid to the numerous ailments which seem to plague your people. A dramatic highlight might be a sudden attack from a black bear whose food supply, especially blackberries, is being stolen by your gatherers.

LANGUAGE SCENARIO 4: Practicing with weapons
Your band members will prepare for a hunt, sharpening their skills with a spear/spear thrower, bola, or sling and practicing hurling stones and rocks. Make this scenario resemble an athletic/Olympics field with a discussion of each weapon's merits in killing or maiming particular animals. Each band member should demonstrate (mime) his/her skill with a weapon, as if he were an expert with no peer.

LANGUAGE SCENARIO 5: A hunt celebration

Your band members will bring back to camp large chunks of animal carcass, then cut up the animal, start a fire, cook ribs, suck the marrow out of bones, and make soup, while celebrating a successful hunt. Bragging by key hunters about their pivotal role in the hunt should highlight the mini-drama. Perhaps an argument could take place between two hunters over who delivered the death blow.

LANGUAGE SCENARIO 6: Cave art

Since your band is gifted with several artists, you will dramatize the painting of your cave's walls with various pictures depicting the life experiences of your people. As your band members prepare to paint, discuss what scenes of life you will portray, and what techniques, colors, and flourishes you will include to personalize your original cave art. Have one master artist demonstrate to talented novices how to use charcoal pieces, how to mix paint, and how to paint on the wall.

LANGUAGE SCENARIO 7: Fishing

Your band will be entrusted to be your clan's skilled fishermen who are now going to teach two beginning fishermen. Therefore, demonstrate fishing techniques: using harpoons; catching fish with your bare hands; using other fishing gear (refer to the essay on toolmaking from Passage II). Show the emotions that beset fishermen in any era of prehistory or history—elation and frustration. Your women can gather shell fish as your men fish.

SCENARIO INTERPRETATION FORM

Evaluator name: _____ Date:_____ Period: _____

Performing band: _____

As you watch and listen, answer/interpret the following:

1. Who are the people in the scenario, and what is their relationship?

   _____

   _____

   _____

   _____

2. What is this band doing?

   _____

   _____

3. What is their problem or dilemma?

   _____

   _____

4. At what point during the performance did you clearly understand what this band was dramatizing?

   Circle one: **Beginning** **Middle** **End** **Never Sure**

5. Which specific words, gestures, body language, grunts, and/or hand signals were the most effective in communicating language meaning to the audience?

   _____

   _____

   _____

   _____

6. Give this scenario a title: "_____"

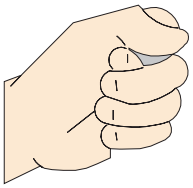
7. After hearing the description of the LANGUAGE SCENARIO, rate (on a scale of 1 to 10, 10 being the highest) this band's success in its ability to convey its scenario: **1 2 3 4 5 6 7 8 9 10**

Final debriefing: Your teacher will lead a class discussion on the quality of each band's LANGUAGE SCENARIO presentation.

Guidelines for the Clan Gathering

You have been chosen to be the **Great Goo-Bur**, the leader of the entire clan at the clan gathering, where problems facing the people have come up and cannot be ignored.

"If their answer is 'yes,'



the fist goes up and down …"

Try to find a wig and robe to wear. A long staff would give you some extra authority.

Have fun with your role as the Great Goo-Bur but … be in charge!

Comments on procedure

Be authoritative as you follow these six steps:

1. Obtain from your teacher the names of individuals accused in each Cave Court Case.
2. Call the clan to order, announcing the need for a meeting to discuss and decide various cases.
3. Preside over each case, giving ample time to hear both sides, ensuring that an appropriate decision/punishment is made.
4. See that there is a nice smooth transition from case to case.
5. Come up with a clever way to vote on each issue. Have each band representative vote on "What should be done?" In the novel/film *The Clan of the Cave Bear*, author Jean Auel has all voters make a clenched fist and hold them in front of their chests. If their answer is "yes," the fist goes up and down; if "no," it is a lateral movement.
6. End the proceeding with a short speech on justice being served, tradition being upheld, and wisdom having prevailed.

Nine specific steps

Once you are introduced as the **Great Goo-Bur**, guide the gathering by following these steps:

1. Each band sends a representative to serve as your council of advisors.
2. The first band's representative reads aloud the particular Cave Court Case that his or her band has analyzed.
3. You read the name of the member of that band who is accused of perpetrating the crime analyzed by the band. You invite the accused individual to stand and explain or defend his/her actions.
4. Ask for comments/opinions from that particular band and then from anyone else at the gathering.
5. Ask that your council of representatives give their opinions whether or not the accused is guilty or innocent.
6. If the council decides that the accused is innocent, release him or her. If the council decides that the accused is guilty, you survey the gathering for a punishment.
7. After listening to the suggested types of punishment, you and the council of representatives must vote on a punishment deemed appropriate by the "fist" response detailed above.
8. Proceed with this sequence until all Cave Court Cases have been heard and decided.
9. End this Cave Court session with a short speech concluding that justice has been accomplished.

CAVE COURT CASES - 1

> Stone Age people had to deal with social dilemmas and problems …

Introduction

Like any other aspect of their usually short lives, Stone Age people had to deal with social dilemmas and problems within their bands and clans. Because how they dealt with these remains a mystery, we can only speculate about what such sessions were like. Early humans, specifically, Cro-Magnons, hunted, gathered, and lived together, not always cooperatively. Inevitably they had to resolve matters involving differences within or between families. Examples of likely conflicts: division of labor; gender roles; care and raising of children; sharing of food/fuel resources and shelter; theft and perhaps murder (although violence was apparently rare); sickness and care of the elderly, death, and conflict with other bands.

We have no idea what specific rules and traditions primitive humans were accountable to or what happened when these were broken either unintentionally or deliberately. Writer Jean M. Auel, in her four Clan of the Cave Bear novels on Neanderthals and Cro-Magnons, has given us a "window" through which we view Stone Age problems and resolutions presented in as perceptive and believable a manner as any paleoanthropologist could speculate. Of course, she has written with color, drama, and imagination.

What is going to happen?

BONES & STONES now gives you and your classmates opportunities to discuss several Cave Court Cases that could have confronted Cro-Magnons around 20,000 years B.P. Hopefully, the process and outcomes of these conflicts will allow that "window" into the Stone Age to become larger and clearer. It will also afford some of you a chance to sharpen your thinking and persuasive speaking skills and learn a measure of primitive democracy. Inspiration for such an activity again stems from the fascinating novel *The Clan of the Cave Bear*, during which male members of a fictional clan meet, discuss, and finally decide on the fate of Ayla, a young female Cro-Magnon who has shocked her adopted Neanderthal clan by becoming skilled with the use of the sling. This skill defied the centuries-old custom that only males practiced the arts of weaponry and war.

> … a chance to sharpen your thinking and persuasive speaking skills and learn a measure of primitive democracy …

Three preparation steps for your band to follow

Step 1:
Read each of the following Cave Court Case *very carefully*, thinking about the situation that caused each dilemma.

Step 2:
On a separate sheet of paper write down at least two arguments for or against the accused in the case your teacher has assigned. With your band members, decide what you think should be done.

Step 3:
Be ready to defend your statements before all the other bands if you are called on to respond at the clan gathering.

Cave Court Case 1

Stealing food

_____ , a young male of the _____ band, is accused of stealing food from another band in the clan. This is a very serious crime because hunting and gathering food has been difficult due to the long, severe winter. Some believe he has done this twice before, but only now has he been caught. What should be done?

Cave Court Case 2

Breaking tradition

_____ , a young female of the _____ band, is accused of using a sling and stone to kill a gray wolf as the animal made off with a baby boy in its jaws. Despite the fact that she saved a child who is this clan's future leader, females using weapons is traditionally forbidden. Obviously this female has secretly practiced her skill with the sling over time, again in defiance of clan custom. What should be done?

Cave Court Case 3

Child with problem

_____ , _____a female of the band, has given birth to a child whose appearance during the first week indicates that he is deformed. The child will be difficult for the band to raise and will no doubt be an extra burden to the entire clan over time, for as an adolescent and adult he will not contribute to the clan. Custom dictates that the child should be taken away, abandoned, and left to die. The mother, however, has bonded strongly with the child. What should be done?

Cave Court Case 4

Useless old band member

_____ , an elderly male of the _____ band, can no longer hunt with the other males. His uselessness and lack of mobility have made him a burden to the band. He is forced to remain in the shelter while the women, children, and other elderly gather and forage for non-animal food sources. Custom dictates that when a person reaches this stage of life, he or she voluntarily leaves the band, walking away to find peace in the spirit world beyond. He has refused to leave. What should be done?

Cave Court Case 5

Homicide within the band

_____ , a possessive, temperamental male of the _____ band, is accused of murdering another man after a heated argument over the accused's mate. The victim had not taken a mate for himself over the years, but he saw no problem in pursuing band women bonded to other band males. By custom, clan males are not necessarily monogamous; nonetheless, another custom makes it wrong for anyone to break up an obvious family unit. What should be done?

Cave Court Case 6

Breaking a hunting taboo

_____ , a male of the _____ band, has tamed a wild dog to hunt with him and keeps the animal in a separate cave. To domesticate such a beast for use as an aide in hunting is taboo in clan tradition. As a result, this male has become a lone hunter who no longer joins the other males on hunting trips. Additionally, he feeds his dog with precious food. What should be done?

Cave Court Case 7

Defacing clan art

_____ , a male of the _____ band, was caught inside a deep cave where only The Chosen are allowed to go. Upset over not being one of those chosen to paint pictures of the clan's successful hunt last spring, he used his own black paint to deface and nearly destroy the magnificent cave art rendered by more talented artists. What should be done?

4—Passage IIII: Cave Art

> “… as visible proof that they were able to create a culture …”

Introduction

In some ways they have been compared to the works of Monet and Picasso, but the paintings found on cave walls in France and Spain were created by talented Cro-Magnon artists over 14,000 years B.P. These paintings are, some have written, the greatest monuments left by early humans as visible proof that they were advanced enough to create a culture. In Passage IIII: Cave Art, your students will work in art groups (cadres) that do not coincide with their regular band affiliation, but they will still earn Survival Stones for their bands. These art cadres will re-create bellowing bisons, trotting horses, and other prey on your school’s “cave walls.” A concise essay on cave art helps prepare students for their task of rendering specific scenes on long stretches of butcher paper. This is all done in a dimly lit “cave,” as students apply paint with brushes fashioned from natural materials. Afterward, they discuss descriptions and interpretations of these magnificent depictions of Stone Age life. Finally, during a review of earlier **BONES & STONES** passages as well as this one, students participate in or listen to a lively interview with a “genuine” Stone Age family that promises to explode the myths perpetuated by Hollywood clunkers and Bedrock’s most famous resident.

Flourishes

- For this Passage’s activity, make a genuine effort to secure a multipurpose room to simulate a cavernous location for students as they paint their stretch of “cave wall.”
- Try to find an audio cassette or CD of environmental sounds (e.g., thunderstorms, loons on a lake, ocean surf, mountain winds, etc.) and play it during the activity.
- Consider using lanterns, otherwise use flashlights, to simulate the cave torches that real Stone Agers utilized 14,000 years ago. (Effective, safe lanterns can be made from coffee cans with votive candles stuck in sand in the cans’ bottoms.)
- Put a large banner over the door to the “caves” saying **“Welcome to 14,000 years B.P.”** to set the historical perspective.
- If you have the photographic skills, make slides from pictures of cave paintings. Two excellent source books are listed in the Introduction, on pages 10 and 13: 1-Bahn, Paul and Jean Vertut, *Images of the Ice Age*; and 2-Prideaux, Tom, *Cro-Magnon Man*. Show the color slides you made to your anxious artists the day before the cave painting activity.

Materials

- Art paper—*class set*
- Tempera paint—*two 16-fluid-ounce bottles of each color per class* (brown, black, red, yellow, and white)
  Options: colored chalk, or natural paints made from ground berries, crushed flower petals, ground charcoal briquettes, powdered brick or clay, egg whites and/or yolks, and student ingenuity
- Paper plates/paper bowls—*20 or more of each*
  Options: margarine tubs, pie tins, or other similar containers
- Light brown butcher paper—*100' long*
  (45' to 50' long for the cave art wall and the same amount to cover the floor beneath, 4' to 5' long for each cadre)
  Option: grocery sacks cut open and taped together
- Masking tape—*one roll*
- Lanterns—*20 for a medium-sized room*
  (Candles are set securely in sand within large metal cans.)
  Options: Choices would reflect your school's safety policy.
- Cassette or CD player and recordings of environmental sounds—*one hour's duration*
- Buckets—*two 5-gallon-sizes*
  (These should suffice as "the river" used for periodic cleansing of hands and brushes.)
- Paper towels—*two rolls* (placed near the water buckets)

Materials from students (labeled with their names to prevent loss)

- Flashlights—*two per cadre*
- Brushes—*each student fashions his or her own*
- **Option:** Clothing cover-up (oversized Tee-shirts, aprons, smocks, large shirts buttoned up the back)—*each student brings one*

Teaching Tip

If you elect to have students not bring cover-ups, advise your students to wear "grubby" clothes on the day of the Cave Painting activity.

Duplication

Duplicate the following in the number found in italics.

- CAVE ART—*class set*
- CAVE PAINTING SCENES—*one per cadre*
- CAVE PAINTING INSTRUCTIONS—*class set*
- CAVE PAINTING EVALUATION—*one per class*
- CAVE PAINTING SELF-EVALUATION—*class set*
- A VISIT WITH A STONE AGE FAMILY—*six sets or class set*

Using a natural brush and red ochre paint, one Cro-Magnon artist leaves an artistic flourish for the admiration of future generations.

Teaching Tip

We recommend that whatever you devise as a brush, practice painting at home to facilitate your demonstration to the class.

If you have a large class (more than 36 students) double up on CAVE PAINTING SCENE assignments to keep the cadres small. If you have 28 or fewer students, you may keep students in their original seven bands.

Setup

1. Making brushes

a. Make one or two "natural" paint brushes, such as pine needles or fibrous twigs with a mashed end, and/or moss to serve as a painting swab.

b. Practice using them at home, then bring them in to demonstrate their use to your students.

2. Preparing for the Cave Painting activity

a. Assemble all painting supplies.

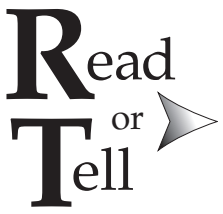
b. Secure access to a suitable room for your cave artists. Hang the 4- to 5-foot sections of butcher paper securely, and make sure that the floors are adequately protected. Decide where the buckets of "river" water will be located, and count out adequate containers for paints for each painting cadre.

c. Depending on the number of students you have in class, and how many cave painting scenes will be assigned, randomly number students accordingly (for example, if you are using nine scenes, number students from 1 to 9). Ideally, three to four students per cave cadre is best. Inform students that a "cadre" is a small highly motivated group focused on a task.

d. Copy and cut apart the CAVE PAINTING SCENE sheets, allowing one scene for each cadre.

DAY 1: PREPARING FOR PAINTING

1. If you have not awarded Survival Stones for band performances in Passage III: Language, do so now. Perhaps you should single out the best band and the best actors; that is, those students who most effectively used gestures, body language, and a Stone Age lexicon to communicate the essence of their scenario.



2. As a motivator for the Passage IIII: Cave Art activity, read or tell in your own more dramatic words this scenario:

> "Imagine that you're lying in bed visualizing your brother's success in tomorrow's soccer match for the city championship. As his best fan, you want to create one of those great looking computer-generated good luck banners seen frequently in neighborhoods having a champion who is facing a new challenge. So you assign yourself the task of making the banner for your brother's quest. Only one catch: the society you live in has no written language. That means you'll have to communicate your best wishes and good luck using symbols, figures, and designs, but no words."

3. Having heard this story, students should draw and/or illustrate on their art paper how they would communicate the sentiments of good luck in the upcoming soccer match expressed in the story—*without using any words*.
   a. Allow three to five minutes or more for this rather difficult task. Then, ask for volunteers to come forward to share/draw their ideas for all to see.
   b. Once done, lead a discussion to make a transition neatly into the difficulty facing prehistoric people as they painted scenes on cave walls prior to an important hunt. Certainly, some of the paintings on cave walls left by Cro-Magnon artists have more profound meanings than good luck on a hunt. Indeed, this very modern sentiment adorns cave walls much like our garage banners.

Teaching Tip

The authors made a video from the slides, adding narration and sound effects. Showing this on a large-screen TV in a multipurpose room right before the Cave Painting activity is very effective.

4. Hand out the CAVE ART background essay and read it aloud with frequent discussion stops. Emphasize the discoveries at Altamira and Lascaux:
   a. painting techniques;
   b. what the artists used for paints and brushes;
   c. the choices of subjects these artists depicted;
   d. why they painted on walls;
   e. and their significance: that Cro-Magnon people created a cultural breakthrough demonstrating that their existence had progressed beyond mere survival.

5. Following the discussion of the essay, you may want to demonstrate the paint and paint brushes you made from natural materials.
   a. Hold up what you created and explain how you made them.
   b. Pass the items around the room so that students can touch and carefully examine what you have created.
   c. Encourage everyone to suggest ways to improve what you have done.
   d. With regards to paint, you should demonstrate in poster paint, rather than a liquidy glop of egg whites/yolks, ground charcoal, flower petals, powdered brick, etc. which is, by the way, an option for students in the Cave Painting activity.
   e. Hand out (or go over orally) the CAVE PAINTING INSTRUCTIONS handout. Carefully discuss the information.

6. Show the slides you made on real cave art taken from books on the subject.
   a. Eight to 10 slides, along with some commentary from you, would most certainly reinforce the main points of the CAVE ART essay and motivate your students.
   b. The Chinese proverb, “A picture is worth a thousand words,” comes to mind here as an appropriate quotation.
   c. Answer any questions that arise about the subject, student responsibilities, and the sequence of events the next day.
   d. Remind students to bring in their natural paint brushes, paints (if appropriate), labeled flashlights, and oversized old Tee-shirts, aprons, or artist smocks.

7. Before you leave for the day, ensure that you have secured and prepared the room you are utilizing for the CAVE PAINTING activity on Day 2.

Day 2: Cave Painting

Teaching Tip

If you have block scheduling, you may want to show the slides and review the CAVE PAINTING INSTRUCTIONS on the same day you schedule the Cave Painting Activity.

Remember to allow plenty of time for cleaning up. If you use disposable containers for paint, this task is easy!

1. Feeling secure now that you have readied your cave-walled room and have in place all necessary materials, make certain students have their flashlights, natural brushes, and old T-shirts to wear during the activity so that they won't ruin their clothing. Review the steps and rules from the CAVE PAINTING INSTRUCTIONS handout; you may allow them to take these handouts with them, to refer to as they work on their paintings.

2. Escort students to the darkened "cave" painting area (if different than your classroom), have them sit on the floor of the darkened room with all flashlights off—except for yours and maybe one other.

3. If you have not yet shown the slides of cave art, do so now or proceed on to number 4.

4. Tell students that each cadre will now be given a CAVE PAINTING SCENE to depict on their designated area of cave wall.

5. Call up each cadre by number and distribute the assigned CAVE PAINTING SCENE. Point your flashlight at the panel on the wall where the members of that cadre will paint. As each cadre receives its CAVE PAINTING SCENE, the flashlight(s) can be used as a torch to illuminate its area. (If you are using the lantern flourish, light these candles now. *Make certain the candles are safely enclosed.*)

6. Allow students 20 to 30 minutes to paint their scenes. As cadres finish painting their scenes, remind them to plan their story which will be shared with the rest of the cadres at the next class meeting.

Working by candlelight on dank cave walls, Sky Band pools their artistic talents in hopes of a successful hunt.

DAY 3: EVALUATION

1. Have the cadres gather around their cave wall panels. Tell students you will be evaluating their art work and their presentations.
   a. Each member of a cadre will have something to say about the overall painting, by helping to develop the story within the work and by telling specifically what he/she did on the panel.
   b. Remind students to be creative in their story-telling. Encourage them to use vivid descriptions and embellishments.
   c. Tell them that Survival Stones will be awarded to cadres, and members of the cadres will be able to add their share of Survival Stones to their band's Survival Stones total.

2. Answer any questions students may have.
   a. Then allow three to five minutes for cadres to sort out the presentation task.
   b. Go around the room and ask each cadre to present its cave art and story.
   c. Using the CAVE PAINTING EVALUATION sheet, fill out the Evaluation Box on each cadre's scene. *Wait until the next hour to tell students what their cadre received.*

Anticipating the criticism of their peers, these Dirt Band artists interpret their work in front of the entire clan.

3. Hand out the CAVE PAINTING SELF-EVALUATION to each student. Tell them to fill it out honestly and return it at the next class meeting, when you will award individuals with Survival Stones.

4. Hand out A VISIT WITH A STONE AGE FAMILY to each of the five volunteers who will be the interviewer and the four Stone Age family interviewees for extra credit in Day 4. Tell them to read their parts carefully and try to get into his/her character's "psyche."

Teaching Tip

The interviewer and each of the stone age family members needs a complete script. You can follow the dialog on your script.

Drek and his Stone Age family help a modern TV interviewer sort out the differences between his world of 20,000 years BP and ours…what's TV?

Day 4: Evaluation and Stone Age Family Interview

1. Collect the CAVE PAINTING SELF-EVALUATION sheets from each student.

2. Award Survival Stones for the Cave Art activity.
   a. Ensure that individuals in the bands receive the number of Survival Stones you wrote in the evaluation boxes for their Cave Painting Scene.
   b. Whoever in each band keeps the Survival Stones Tally should be alerted to count Survival Stones earned by each band member from his or her art cadre. Each cadre can earn up to 10.

3. This is a transition/breather day between the cave art activity and the megaliths construction activity in Passage ~~III~~.
   a. We feel it is wise to separate these two highly active passages with a weekend if you can arrange this with your schedule.
   b. Therefore, we recommend that you bring some closure to the first four passages by staging an interview of a "real" Stone Age family, consisting of Drek, Meesa, Jaroo and Bok.

Teaching Tip

The CAVE PAINTING SELF EVALUATION sheets should be collected and a student grade (A, B, C, etc.) or points (Survival Stones) be recorded into your grade book; or compare the students' CAVE PAINTING SELF EVALUATIONS with your assessments given during the cadre presentations.

Teaching tip →

The more elaborately you stage this, the more impact the interview will have on your students.

4. Try to set up for the interview by putting the four Stone Agers in Stone Age setting.
   a. Perhaps they could already be in place, working at prehistoric tasks in the middle of the room surrounded by the entire clan when you (or your designate) dramatically says: "The time: 14,000 years B.P. The place …"
   b. An option is to duplicate the interview handout for the entire class. In this way, you can lead a general class discussion on specifics following the actual interview.

5. You may want to clarify, explain, or ask questions of role-players during the interview, although this would interrupt the interview's continuity and flow. Whatever you decide, have some fun with the activity and encourage some ad-libs and humor during the interview.

6. Once the interview is over and the students realize all the familiar ground they've covered, it is appropriate to show one particular video listed in the Introduction, Documentary films, on page 15.
   a. *In Search of Human Origins* is a fine three-part PBS special hosted and narrated by Donald Johanson, our most famous fossil hunter. (His car license plate reads "FSLHNTR.") Johanson discovered "Lucy."
   b. At the end of part 3, there is a 20 minute segment on cave art, in which a French expert demonstrates his theory on how Cro-Magnon artisans applied paint to the walls of caves in France. It is fascinating stuff—how these artists may have blown on or spit paint on the rough, rocky surfaces not only to fashion their hand signatures but the painted animals as well.

7. Hopefully, you will be able to locate (try asking grade level colleagues or visiting the public library, a large video store, or a local college) this and other exceptional videos on prehistory.
   a. If you do not show a video, try to put together a brief demonstration on how prehistoric artists spit/blew on paint (dip plastic straws into poster paint and blow paint on a piece of poster board or butcher paper).
   b. Of course, what you do to enhance this Cave Art Passage will no doubt depend on your own energy level at this point.

Demonstrating the "blowing paint" technique could, of course, be done before the Cave Painting activity to enhance what students will learn and appreciate.

In 1940, a child lost in a French cave discovered the "Hall of Bulls," magnificent wall art similar to this work rendered by Sky Band.

Beyond survival

Of all the marvels we attribute to the emergence of *Homo sapiens sapiens*, none makes these intelligent humans more modern and like us than the remarkable cave paintings found in Europe. These pieces of art were painted by Cro-Magnon people (the term for *Homo sapiens sapiens* in Europe) about 14,000 years B.P. These examples of prehistoric art and culture remain an awesome reminder of how our ancestors began to think and act beyond a survival level.

Awesome Altamira

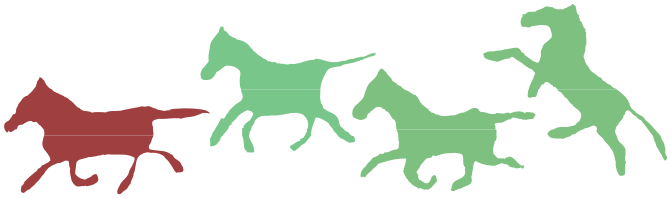
Cave art has been discovered worldwide, but much of our knowledge comes from the caves in Europe. Over 100 painted caves have been found in France and Spain alone. Two of the most famous, Altamira in northern Spain and Lascaux in southern France, were both discovered by accident, the former by a twelve-year-old girl in 1879 and the latter by four boys in 1940. Sealed within the depths of the Altamira cave are magnificent paintings of a herd of bison depicted in various poses, as well as wild boars, deer, and horses, some of which are life size. Discovered at the same time were small engraved cuts in the rock, hand prints stenciled onto the stone and designs and sketches scratched on the clay of the ceiling.

> “Over 100 painted caves have been found in France and Spain alone.”

The bulls at Lascaux

Even more magnificent than Altamira are the cave paintings at Lascaux. Vibrant colors have been preserved on rock which has been naturally varnished by a coating of the mineral calcite. The beauty of the “Hall of the Bulls” is striking. Painted animals nearly leap out from the cave’s walls (100 ft. long and 132 ft. wide) rather than the ceilings as at Altamira. Lifelike huge bulls adorn the cave wall, some taking their form from the shape of the rock itself. In another, more narrow gallery, walls and ceilings are filled with artists’ renderings of horses, stags, cattle, and goats. Also found at Lascaux are abstract, geometric designs and a number of engravings. Probably the most mysterious of all the art is a painting found near the entrance to the “Hall of the Bulls”; it resembles a unicorn but has two horns coming from its head. This strange animal, which appears to have the body of a rhinoceros and the muzzle of a lion, remains as much a mystery as the rest of the art found in caves.

> “Painted animals nearly leap out from the cave’s walls …”



"… using a variety of skills, techniques, and natural materials …"

Artists' techniques

These marvelous works of art were produced using a variety of skills, techniques, and natural materials. Natural bulges of rock on the walls of caves were sometimes used to show forms. A mix of natural pigments with animal fat or some other binding substance gave the artists' work permanence. An outline of the figure was first drawn using charcoal or "crayon" sticks of ocher (iron oxide); then it was engraved and finally colored. Pigments were made from iron oxide, a mineral which comes in different shades of red, yellow and brown. Black came from manganese oxide and sometimes charcoal. Limestone was used for white. After grinding these substances into fine powders, they were mixed with water, blood, egg white, animal fat, or some other common binder. These resulting paints were applied with brushes made of animal hair or fur, twigs with mashed ends, feathers, or bristles. Some of the color was applied by patting on paint with swabs of hair or moss. Another technique often used was paint blown through a tube made from animal bone or reeds, a type of stenciling. Hand prints, the artists' personal signature, were often blown onto the surface as a finishing touch.

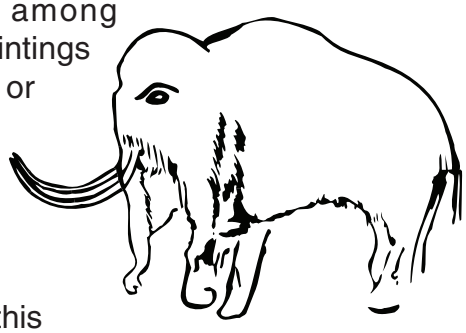
Master artists

Most likely the entire process was a group effort. A master artist supervised several chosen painters and others who made brushes and mixed paints and binders. Some held lamps, stone bowls filled with animal fat, with wicks made from hair or moss which floated on top. To reach ceilings and other high places, it appears some type of scaffolding was used. Brushes with long handles or painters standing on each others' shoulders may have been options to paint in high places.

"… many have  fingers missing …"

Hands and mammoths

Human hands are among the oldest of the paintings rendered. Painted red or stenciled by blowing paint through a tube as noted above, many have fingers missing, causing speculation among anthropologists that perhaps this mutilation was a common practice, possibly as part of a some ritual or ceremony. Keep in mind, cave paintings were produced many years ago (up to about 15,000 years), and they reflect those animals that existed during the era in which they were painted. Thus, earlier paintings depict mammoths and woolly rhinoceros, while later renderings show horses, cattle (bulls and cows), bison, deer, wild boars, and others. Certain abstract designs also occur with particular groups of animals.



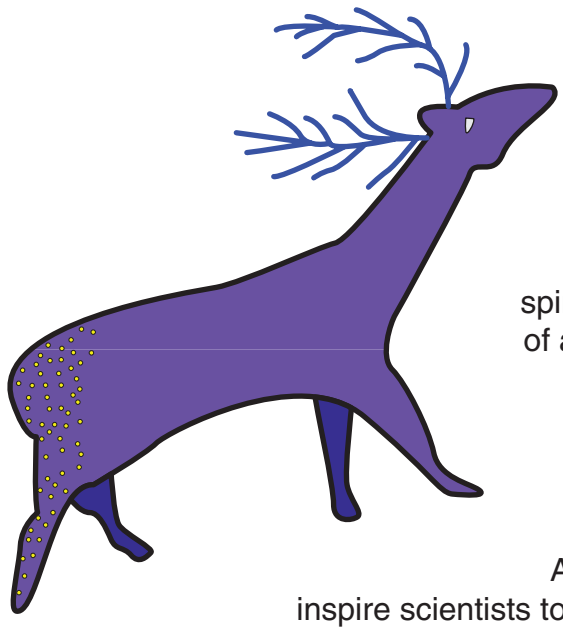
> … chose to paint in hidden places …

Sympathetic magic

Living mainly at the mouths or entrances of caves, Cro-Magnons chose to paint in hidden places which were not easily accessible, back in the narrow, dark, deep recesses of caves. These chambers were probably secret places where magic rituals were conducted. The most common explanation of these practices is that of "sympathetic magic," the belief that killing the animal's image would guarantee a successful hunt.

A good kill

Possibly believing they possessed power over the animals depicted, the artists painted these creatures as successful prey. One example is a bison with spears sticking out from it and doubled over as a dying animal would actually appear. All this was possibly painted to ensure a good kill and give the hunter special courage. It is thought that some paintings were themselves part of an actual ceremony. Dancing men draped with skins of animals and wearing masks, perhaps to cast spells on animal spirits, may be depicting a shaman or sorcerer performing some kind of ceremony. In any case, the artists may have mimicked a hunt with real or imaginary weapons. It is probable this belief in spirits and magic prompted rituals led by the head of a clan, a master artist, or a "chosen one." Other less accepted explanations of what the cave paintings of animals mean stimulate lively discussion among anthropologists, for some of these ideas and theories of religious meanings are not as widely accepted as others. All in all, these cave art wonders will continue to inspire scientists to ponder the intent of the creators of these marvelous works of art.



Working by candlelight on dank cave walls, Sky Band pools their artistic talents in hopes of a successful hunt.

Cave Painting Scene 1

Everyday life: humans, bellowing bison, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a bellowing (loud, deep sound) bison with open jaws, its head jutting forward, with eyes full of fury, a bristling mane and arched back. What might be causing this bull to be so full of rage? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 2

Everyday life: humans, dancing men, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: dancing men draped with the skins of animals, wearing masks and stag antlers. What kind of ceremony or ritual might this represent? What kind of spells might they be casting and why? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 3

Everyday life: humans, horses, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: horses running, trotting, standing, rearing and falling backward. Is something frightening them? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 4

Everyday life: humans, a "unicorn" animal, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a strange animal with the body of a rhinoceros, a lion muzzle, and two straight horns coming from the front of the head. What hidden meaning does this mysterious animal hold for your band? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 5

Everyday life: humans, a man with a bird's head, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a man with a bird's head, a bird on a rod, a disemboweled bison, and a rhinoceros. Is this a part of some kind of initiation rite perhaps? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 6

Everyday life: humans, a wolf, spears, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: two horses, a wolf, three female deer and three wild boars; spears and arrows are sticking out of some of the animals; men are shooting arrows at deer. Is this painting recounting the hunting prowess of your band? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 7

Everyday life: humans, woolly mammoths, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a herd of woolly mammoths. Was your band successful in driving them into pit traps? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 8

Everyday life: humans, bison, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a herd of bison; some standing, one sitting with its legs folded under, one with a spear sticking out of it. Are these animals being stalked and hunted? What will be the fate of the animal with the spear? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

Cave Painting Scene 9

Everyday life: humans, stags, and?

Imagine that you are prehistoric artists. Paint a scene depicting the everyday life of early humans including the following: a group of stags (deer) in red, brown, and yellow, alert to danger. Of what might they be afraid? Be creative! You may add other figures and animals to your cave painting if you wish. Be prepared to tell the rest of the class the story your cave painting is depicting. *Remember to sign your piece of art with a hand signature.*

CAVE PAINTING INSTRUCTIONS

Painting Directions

1. **Outline at first.** After your cadre receives your assigned CAVE PAINTING SCENE, plan out who will do what. A good idea is to have your most artistic member outline the figures and then assign other members to color them, once the cadre has decided what goes where.
2. **Make drawings large.** Your drawings should fill your cave wall. Some of the actual cave paintings have animals nearly life size.
3. **Use authentic brushes.** Use only homemade brushes of natural materials to apply paint, with the exception of the hand signature which you paint last.

Notice the end of this student's paint brush. It is actually a part of the stick. He used a stone to mash the end of the stick so that its battered end became a "brush."

4. **Use one brush per color**. Using one brush for each color is important. When you need to wash out a brush at the "river," that is, the buckets of water provided by your teacher, you may send only one member at a time.
5. **Have one person make the hand print signature**. When you have finished your painting, only one person should make the hand print signature. Although most of the hand prints in the actual caves were done by some type of stenciling technique, you will make yours by brushing your hand with a little paint and printing it on your cave wall.
6. **Plan your story presentation**. Begin planning your oral presentation to explain your painting to the rest of the class.
   - Tell the full story of the painting as it was described.
   - Each cadre member must participate in explaining the painting's story and describe his or her participation in the painting.
   - Use appropriate and expressive language, make eye contact with your audience, and project your voice so that you can be heard.
7. **Remain in your cave.** Stay in your designated cave area at all times unless you are the cadre member selected to go to the "river."

Learning Tip

Note how your teacher will evaluate both your art and your story presentation about your art.

Cave Painting Presentation Evaluation

As your cadre explains your painting to the class, your teacher will evaluate your cave art and its presentation, using these four questions. *Each cadre can receive up to 10 Survival Stones for its presentation:*

1. How authentic does your CAVE PAINTING SCENE look?
2. How well does your CAVE PAINTING SCENE use color, and how effectively are its objects arranged?
3. How well does your CAVE PAINTING SCENE reflect the description?
4. How vividly, clearly, and creatively do cadre members make their oral presentation?

CAVE PAINTING TEACHER EVALUATION - 1

Cave Painting Scene 1—Bellowing Bison

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 2—Dancing Men

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 3—Horses

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 4—"Unicorn"

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

CAVE PAINTING TEACHER EVALUATION - 2

Cave Painting Scene 5—Man/Bird's Head

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 6—Wolf and Spears

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 7—Mammoths

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 8—Bison

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

Cave Painting Scene 9—Stags

Cadre Members

Painting's authenticity

Color and objects

The scene's power

Clarity and power of the story presentation

Survival

Stones

CAVE PAINTING SELF-EVALUATION

Stone Ager name: _____ Band: _____

Real name: _____

Painting portion

1. Describe the scene your cadre painted.

2. What specific parts of the scene did you paint?

3. How well did your cadre work together to complete your painting?

4. What difficulties were surmounted?

Presentation portion

5. Did your presentation hold the audience's attention, was it creative, and did it tell the full story of the painting? Why or why not?

6. Did each member of your cadre make interesting comments about the painting and advance the scene's story? Explain what you said during this portion.

7. Did you make eye contact with others, project your voice, and use appropriate and expressive language? Explain.

Brag List (Other considerations you'd like to add to enhance your evaluation.)

Award

Compared to the other cave paintings and presentations, how many Survival Stones out of a maximum of 10 would you award your cadre? Circle one of the numbers below.

1 2 3 4 5 6 7 8 9 10

A VISIT WITH A STONE AGE FAMILY - 1

Time: 14,000 years B.P.
Place: The Green Valley (now southern France)
Situation: Drek, Meesa, Jaroo, and Bok, a family living during the close of the Ice Age in what is now Europe, have just survived another harsh winter. Spring in the Green Valley is magnificent with blazing color, clean air, and abundant food. Called Cro-Magnon by most modern anthropologists, humans like this family who have evolved over the millennia are still struggling to survive, but now in the Neolithic (New Stone Age) era, they are dominating the planet's surface resources and lower animals as never before. This is one family's story of Stone Age life—four Cro-Magnons who represent *Homo sapiens sapiens* everywhere, about 14 millennia ago.

➤ ➤ ➤

Acting Tip

Be dramatic some of the times you pause. It is a way of gaining control of your audience.

Interviewer: Excuse me, Drek. *(Pause)* I'm wondering if we modern humans of the late 20th and early 21st centuries CE—14,000 years in the future—might chat with you and your family about life in what we call "the Stone Age of prehistory."

Drek: Pah! *(Nodding … Pause)* If you like. Going out to hunt with the other men. Herd of bison nearby.

Interviewer: Thank you. May we meet the others in your family?

➤ ➤ ➤

Acting Tip

Drek, call attention to yourself by thumping your chest.

Drek: *(Pointing to himself)* Drek, as you know. *(Pause)* Drek's mate is Meesa. Children are Jaroo, my daughter, and Bok, our young son. By the way, what's Stone … Age?

Interviewer: It's nice to meet you all. *(Pause)* Drek, why do you suppose we label your time the "Stone Age"?

Drek: *(Holding up stone tools)* Probably because of tools and weapons. You have better materials to use in the future?

Interviewer: Oh my, yes. Eventually people, mostly men, will use metals to fashion more sophisticated tools—hammers, picks, knives, and weapons. In this time we use machines run by electricity, batteries, and solar and nuclear power. And we can kill animals, and other humans, with guns—weapons that can fire small lead projectiles across a meadow and hit a target.

Drek: I do that with my spear-thrower. Guns … are … better?

Interviewer: Definitely better. *(Pause)* I know about your spear-thrower. I see you've got one close by. Would you demonstrate how it works. (*Drek demonstrates its use.)*

Interviewer: Mmm. Very efficient … for Stone Age technology. *(Pause)* Let's continue. Many of my generation, and the one preceding mine, have an inaccurate perception of the Stone Age because we and they watched electronic moving pictures on something called a TV set about a modern *(sings the title)* "Stone Age … Fam-i-lee" named the *Flintstones*, whose family head, Fred, and his friend Barney Rubble, devise all kinds of modern adaptations to make the Stone Age seem understandable and easier than it really was. So, what's it really like there in the Ice Age as Stone Agers?

➤ ➤ ➤

Acting Tip

Drek, show you care for your mate.

Drek: Pah! *(Nodding)* Have Meesa, my mate, tell you about her day.

Meesa: Hello. By the way, when husband says "Pah!" it is not an offensive word. It translates to."Yes" or "Of course." *(Pause)* Well, much of my day involves raising our two children. At 13 years, Jaroo is nearly grown, so does adult work. Like me, she gathers food for meals. Sometimes we gather plants for medicines. Bok is six years. I need to guide him to be a man like Drek. Hopefully both of them will live into their prime and not depart to the spirit world until 30 or 35 years.

Interviewer: That's it! That's how long you'll live, 30 to 35 years?

Meesa: Yes. That's a long life, considering the dangers of the hunt, large predators, diseases, and such. Drek and I are nearing old age now. *(Pause)* Do you people live longer?

➤ ➤ ➤

Acting Tip

Look right at the interviewer and speak clearly and loudly. Use your body language to show that you want to learn.

Interviewer: More than double your life span. Seventy five years is common. Some blessed with good genes and health and luck may live until 90 or 95.

Meesa: Goodness. *(Pauses, looks at Jaroo)* Jaroo wants to ask you something.

Interviewer: Certainly. Let's get a young point of view.

Jaroo: As you can tell, we live in small bands, and when it is time to become a mate to a man, I have few choices, unless our band goes to a large gathering where more eligible mates come. I'm 13 and ready to be a mate. Do you people choose mates the same way?

Interviewer: Ha! Well, somewhat. Very often men and women fall in love and get married in a church or holy place while they're in their 20s or 30s. Many men and women go to college (school) for several years to prepare for a lengthy 35 to 40 year career. So a marriage is when a couple officially commits to a legal mating. They work to survive financially, especially if children come to the union.

Drek: Sounds complicated. Pah! *(Nodding)* But back to what you wanted to know about our *(Pause)* Stone Age. *(Pause)* Women forage and gather. I hunt with other men. Meesa told you she and children gather and pick berries, nuts, and other edible plant food out front of and around our shelter. If we men are fortunate, we stalk large animals like the woolly mammoth, or herds of horses and bring them down with many spears, bolas, and slings. Bolas and slings work better on smaller game like rabbits and squirrels. Often, we outsmart animals by knowing their habits, movements, and behavior patterns.

Interviewer: Hunting sounds difficult.

➤ ➤ ➤

Acting Tip

Stand tall and show your pride in being a fine hunter, Drek!

Drek: Pah! *(Nodding)* Especially if we're low on our food supply and must bring down an animal. Pressure! The more men, however, the better chance of a kill after a long chase and surrounding them. Sometimes we go off for days or weeks to find a mammoth or a herd of deer. One band nearby has a new weapon that sends a pointed stick at the animal from a stretched piece of leather on a bowed stick.

Interviewer: *(Surprised)*. A bow and arrow!

Drek: Yes. *(Thinking)* It could be called that.

Interviewer: Drek, we moderns think that Stone Age people have lives that were nasty, brutish, and short. Is that about it?

Drek: Meesa may answer that better than I would.

➤ ➤ ➤

Acting Tip

Speak slowly, clearly, and confidently.

Meesa: I'll try. *(Pause)* Well, certainly our lives aren't as bad—dirty, brutish, or short—as our ancestors or like those "grisly folk" you call Neanderthals who live several valleys over from this one. Our people don't mingle with them at all. But, life is a struggle. Maintaining a constant food supply is often difficult. When food is available, we eat well from great variety of meat, game, plant sources, and seafood. This Earth provides an abundance, and we eat just about everything that grows or moves—if we can catch it!

Interviewer: What about quality of life? And relationships between humans?

Meesa: Our tools help prepare food and make life easier. We communicate with others often, sharing problems and solutions.

Drek: And we live comfortably in fire-heated bone and hide shelters, not relying on natural caves for a home anymore. *(Pause)* By the way, we can strike a fire whenever we want.

➤ ➤ ➤

Acting Question

Is it OK to act like a woman and be coy and flirtatious? Do you think women were this way 14,000 years ago? Why or why not?

Jaroo: Our clothes are sewn with bone needles and sinew. *(Pause, and posing)* Like my outfit?

Interviewer: Fetching, Jaroo. You're a good catch.

Drek: I'll bet my daughter is as beautiful as young women in your time.

Interviewer: A little makeup and grooming and some fashionable clothes, and yes … Pah! *(Nodding)* she'd look as attractive as some of our teenage fashion models in magazines.

Drek: Magazines?

Interviewer: Literature, picture books. Sorry. *(Pause)* Let's talk about your ability and apparent need to create art. We've all seen your cave wall paintings. Impressive!

Drek: We think so, too. Some of our people have a natural talent to sketch and then paint animals on the bumpy, irregular walls in the dark recesses of nearby caves.

Interviewer: Yes, I would agree. The animals are so colorful and real. They have a three-dimensional quality, a naturalism. Your art work really resembles our modern art. So beautiful … and you used only brown, red, yellow, and black colors. Just phenomenal! In all that darkness, too.

➤ ➤ ➤

Acting Tip

Bok, show pride in what you did.

Bok: I held the fire pot for one artist.

Interviewer: Did you, now. A fire pot? Must be a kind of lamp, eh?

Bok: A stone bowl with animal fat. It burns for hours. Sometimes, we use seashells and skulls.

Interviewer: Skulls! Yuck! *(Pause)* I'm still amazed, as are modern art critics since the discovery of these caves. The animals seem to jump right off the walls. And for nearly 14,000 years the colors remain as clear and vibrant as ever.

Drek: So you like our cave art. Drawing the animals, it is hoped, will give us hunting … luck … is that the word you might use? Kind of a magic spell for good hunting.

Interviewer: Luck … yes, that's the word. *(Pause)* Magic and hunting luck aside, your cave art is magnificent. Pablo Picasso, our "father" of modern art, saw the caves at Lascaux and Altamira and paid tribute to your artists as his teachers.

Drek: Thank you. But if you love our cave art, then you must be impressed with our stone structures, too.

Interviewer: The megaliths? Stonehenge? Oh, yes!

➤ ➤ ➤

Acting Tip

Show that you are bewildered.

Drek: Megaliths. Hmmm? We don't have a fancy name for them.

Interviewer: Drek, your kind, Cro-Magnon, will build rows of large stones near Carnac, France, near here.

Drek: Yes? … Pah! We have the ability to do that.

Interviewer: I have to tell you, too, that hundreds of miles away, across what we call the English Channel, even more impressive megalith circles will be constructed by people like you. It will be called Stonehenge, stones that seem to hang from the sky. Prehistoric Britons will haul heavy stone slabs to a site and create a magnificent circular temple and observatory. How Stone Age men, like you, Drek, with no modern power tools or heavy machinery will accomplish this is still a mystery to us. Amazing.

Drek: My descendants, in Briton, they will do this? Build Stonehenge?

Interviewer: Absolutely.

Drek: With only stone hammers, bone antlers, picks and the like—our only "power tools"?

Interviewer: Like I said. Amazing!

Drek: We have lots of time. That's how we can do it.

Interviewer: And no modern distractions like TV, radio, computers, books, movies or newspapers.

Drek: Whatever those are. We have so much to do to survive. Just to do nothing is a pleasure.

Interviewer: Yes, well. *(Ready to end interview)* Drek, *(Pause)* from our century to yours, or, should I say from our millennia to yours, thanks for giving us the time

Drek: Like I said. Time is what our family has plenty of. Pah! *(Nodding)*

➤ ➤ ➤

Acting Tip

Look right in the eyes of your audience as you sincerely summarize the main thoughts you wish them to remember.

Interviewer: *(Faces camera and audience)*. Well, there you have it, an up-close look at our *Homo sapiens sapiens* ancestors. These simple folk have indeed taken a quantum leap forward, certainly further than earlier hominids, in hunting, religion, communication, technology, social organization, aesthetics (art and sculpture), and new ways of viewing other human beings. Their achievements are just remarkable. Clearly, these Cro-Magnon are the first "modern" people and the last of the hominids. They set the stage for the last "step" of humankind, advancing toward a complex civilization. *(Slowly with emphasis)* To be sure, here are the so-called "cavemen"—our ancestors—with a difference. And we all are the descendants of them. *(Pause)* Have a nice day, everyone!

Drek and his Stone Age family help a modern TV interviewer sort out the differences between his world of 20,000 years BP and ours…what's TV?

NOTES

5—Passage ~~III~~: Megaliths

> … students can use only rudimentary tools and only one hand…

Purpose

Passage IIII: Megaliths affords your Stone Agers a chance to show their mettle with a real challenge—constructing a replica of the most famous prehistoric stone structure on Earth, Stonehenge. Students begin by reading MYSTERIOUS STONES OF PREHISTORY. Searching through the text for lyrical and impact words, students "find" phrases which they pull out to compose "found" poems, which they print on sketches of trilithons to display within the classroom. Students next assume roles and labor as Engineers, Quarrymen, Log-Rollers, Pullers, Stone Spacers, or On-Site Lifters to begin construction of the class replica of Stonehenge. This construction will not be as easy as it appears to be, since students labor under specific limitations: they can use only rudimentary tools and only one hand while they transport the sarsen stones (cement bricks) from the quarries to the building site and then carefully raise them into position. They will learn, as did their simple yet ingenious ancestors in England around 3,500 years B.P., that great feats such as Stonehenge are accomplished only with cooperation. After completing Stonehenge, accomplished to precise mathematical calculations specified on the enclosed ENGINEER'S BLUEPRINTS, a debriefing serves as a transition for students as they journey from Stone Age England to their university studies at modern Graystone University.

Spacers calculate the exact distance (4") between the inner circle's trilithons, a task necessary for the monument's wondrous symmetry.

Flourishes

Teaching Tip →

This large trilithon further serves to create a stone age ambience that pays dividends in student work and attitude.

1. Make three or four large megaliths in the two pillar/one lintel cap configuration out of gray butcher paper to decorate your classroom during Passage IIII. (Suggested height is 8 to 10 feet and 6 to 7 feet across.) These huge pillar and lintel stones could serve as a display board for the "found" poems students compose.

2. Students read their "found" poems to the entire class and then pin/staple them onto the flat stone pillars.

3. Of all the passages, this one has a cinematic quality perfect for video tape recording. Consider videotaping the entire building process.

4. An appropriate closure flourish is to have a contest to name the new stone structure the class has built. Take the five best suggestions, and vote to determine the winner, whose author could earn five Survival Stones for his/her band.

Teaching Tip

To finance this construction project, consider asking a local service club such as the Rotary, Lions Club, or your principal to provide funds from their budget. Have students take a video of ***Megaliths Moments*** *to show at a meeting in order to thank members for their support.*

Pre-passage alert

Days before you start this passage, purchase the materials needed to implement the activity of building your Stonehenge replica in your classroom or multipurpose room. Go to a large hardware or building supplies store and buy the materials specified below and on the ENGINEER'S BLUEPRINTS on page 5:20.

Before pilot-testing this Passage we authors worked at home for days, experimenting with materials with which to build "Stonehenge": shoe boxes, pieces of wood, card stock templates, etc. Finally, we found that cement bricks work wonderfully well. The had several advantages: they are relatively cheap, they are heavy, and when in place they look like Stonehenge. Their major drawback: you have to haul them back and forth to school. One pilot class, however, carried two bricks per student back to our pickup.

Lying in disarray in the quarry, these sarsen stones wait to be moved to Salisbury Plain through the strong backs and cooperative efforts of prehistoric Britons.

Before Day 2

Organize your site for construction. Place all the bricks in the quarries, jumbled like pick-up-sticks and have all twine, tools, chalk, tape measures, and paper towel cores ready to go.

Materials

- Cement bricks 8" × 4" × 2"—*76 to 80*
- Twine or heavy string—*one spool*
- Wood dowels 4" × 1/2"—*four to five*
- Paper towel cores—*50 or more distributed among the quarries*
- Lever-like tools (putty knives, blade screw drivers, spatulas, etc.)—*10 to 15 for the On-Site Lifters*
- Tape measures (one cloth to measure the radius)—*three to four*
- White or yellow chalk—*two to three pieces*

Duplication

Duplicate the following **Master Pages** (type and quantity in *italics*):

- MYSTERIOUS STONES OF PREHISTORY—*class set*
- MEGALITHS SIGN-UP ROSTER—*one*
- GUIDELINES FOR FOUND POEMS—*class set or display copy*
- "FOUND" POEM TRILITHON—*class set*
  Option: you may want students to use their own paper where they could exhibit more creativity.
- ENGINEER'S MANUAL—*two to three*
- GUIDELINES FOR CONSTRUCTION CREWS—*class set*
  Options: *display copy*
- MEGALITHS CONSTRUCTION DUTIES—*class set or display copy*
- ENGINEER'S BLUEPRINTS—*two to three*

DAY 1: BUILDING PREPARATION

1. Award Survival Stones to the most impressive cave painters and to the volunteers in the interview during Passage IIII: Cave Art.

Teaching Tip →

Remind students to continue working on their stone age toolmaking assignment and the guidelines for these projects from the Introduction period which will be due during Passage ~~III~~ I: Conference.

2. It might be appropriate to do a review check before you move on to this last Passage during which your students are in the Stone Age.
   a. Ask students about the activities they've done to this point, what they've enjoyed, what was the most challenging, etc.
   b. The interview with the Stone Age family at the end of the Cave Art Passage helps remind students in a somewhat different format what they've learned. It's too early for a full and honest assessment, but it does allow for an update on prior activities.

Remember to buy the bricks early enough to utilize them in these demonstrations.

3. As a motivator invite two students forward.
   a. Tell them you want them to move a brick from one side of the room to the other with string or twine, but they cannot lift the brick higher than 2 inches off the ground.
   b. One more limitation: they can use only *one arm/hand* as they transport the brick.
   c. Also tell them that they have to raise the brick, setting it upright, using the aforementioned twine and *only one hand each*.
   d. Watch the results with the rest of your curious class and afterward point out the challenge that awaits them during this Passage.
   e. A quick summary of the Stonehenge construction activity would add interest at this point.

On Day 3 we suggest a video on Stonehenge as a follow-up to the construction activity. However, the video could be used earlier as an enhancement and motivator.

4. Now that you've got your students excited about the upcoming activity, you need to get them to first "build" a foundation of knowledge. They need to digest the MYSTERIOUS STONES OF PREHISTORY background essay.
   a. Hand it out and tell them that this is the last of the fascinating readings required in the simulation.
   b. Since it is a bit lengthier than most of the earlier ones, perhaps band members should read it as a read-a-round.
   c. If you want to present the essay's contents another way, develop a your own presentation from the information in the essay.

5. Once the essay has been discussed, hand out the GUIDELINES FOR "FOUND" POEMS. You can also distribute the "FOUND" POEM TRILITHON, which provides students a trilithon blank on which to write their poems. Note: Your due date for the "found" poem is the day after Construction Day.

The "Found" Poems are due the day after Construction Day. ***Option:*** *The poems could be done cooperatively as a band, with each student contributing words, phrases, or lines. One member could then write out the final poem.*

6. Now it's time to organize the class for the construction of the class megalith structure.
   a. Begin at the top. Select your two or three Engineers wisely, considering leadership, patience, and mutual respect.
   b. If you possess that one shiningly dependable gem—male or female—put him or her in charge, with one or two assistants. Whatever the case, these key students, your Engineers, receive two handouts: the ENGINEER'S MANUAL and the ENGINEER'S BLUEPRINTS.
   c. Distribute or display the display copy of the MEGALITHS CONSTRUCTION DUTIES master and allow students to become familiar with the responsibilities of the various jobs.

Teaching tip →

Once the stones are on site, students who brought all of them can help the On-Site Lifters to facilitate the raising of the sarsen stones, as long as they don't jam up the construction site.

7. Before this preparation day ends, sign up all students for a specific job on the MEGALITHS SIGN-UP ROSTER. If you have a small class, you need a minimum of the following:
   - Quarrymen—*four to six*
   - Pullers—*four to six*
   - Log-Rollers—*six to eight*
   - On-Site Lifters—*two to four*
   - Stone spacer—*one*

   Otherwise, fill up the roster, especially with Pullers and Log Rollers to get the stones to the building site.

Especially vital for understanding are Items 1, 3, 4, 6, 7, 8, and 11.

8. Hopefully, there's enough time to go over the GUIDELINES FOR CONSTRUCTION CREWS, to demonstrate some of the techniques and emphasize some key rules.
   a. **Note well:** Giving every student a copy of the GUIDELINES FOR CONSTRUCTION CREWS may not be better than using a simple display copy which you can go over carefully and slowly in front of all students.
   b. You could post a few copies and have students initial the tops or margins of the posted copies, acknowledging their awareness of the rules.

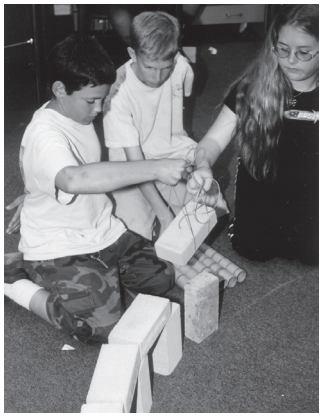
9. A few demonstrations at this juncture seem vital.
   a. Similar to what you did as a motivator, have two to four students come forward to exhibit the frustrating restraints of using only small lever-like tools and using *only one hand.*
   b. Despite these demonstrations, many will still forget or disobey, resort to two hands, and lift with the tools, instead of with twine.
   c. *Do your best to keep them focused and honest!*

Wisdom: *Collect the paper towel cores and lever tools days in advance so you don't come up short on Construction Day.*

10. If you have time, review major points in the essay, check for understanding, and touch base with the Engineers. If you still need paper towel cores, or twine, or lever-like tools, get commitments from students for the next class period.

Teaching tip →

Piloting the Megaliths Passage was done in one regular and one gifted middle school core class. It went smoothly and the results were better in the "average" class, which, because there were fewer "chiefs," followed directions more closely and focused on the laborious task of transporting stones to the construction site.



Skilled lifters maneuver the heavy lintel into place (again with only one hand) after Engineers have precisely measured the stone monument's circumference.

You have the opportunity to make this megalith activity even more indelible on the minds of your students by utilizing these three ideas, plus the naming contest flourish mentioned on page 5:1.

1. You'll need most, likely all, of a 45 to 50 minute class period to complete the megalith circles.
   a. Do one quick review of key rules before you show the students where the three to four quarries are. The should be located at least 12 to 15 feet from the construction site.
   b. Send all workers to their job sites. Again, it's important to emphasize how smoothly the process will go when workers keep the focus on getting the stones to the construction site, and making sure the circle measurements are exact.

2. Perhaps a bell or alarm could kick off the start of the activity.
   a. Over the course of the construction process, supervise students as they work at their jobs.
   b. Supervision is really necessary but will not be that difficult because this activity generates focus and intensity. Students really love doing it and want to build.
   c. However, there will be frequent rule violations: using two hands to lift the stones into place and misusing the lever tools to lift the stones, because the students find these limitations frustrating.
   d. You will also have to monitor the initial measurement stage.

"Builders Begin!"

3. When the stone circles are in place 40 to 50 minutes later, you might want to initiate some "Hip, Hip Hoorays!" and take photos of all students around their Stonehenge-like structure. If the measurements were off, or for some reason, the last bricks don't fit into the circles (pillars and/or lintel caps), finish the structure anyway for the photo opportunity it provides.

4. Once picture-taking ends, if you need the stones returned to the quarries for another class, have students do that task now, placing the bricks at random (like pick-up-sticks) in the quarries.

5. Either now or during the first few minutes of the next day's class, have students do a quick-write journal entry:
   a. Have them describe the entire construction process, their feelings of cooperating to get the task done, and how they felt when the Stonehenge-like structure was completed.
   b. Students should "stay in character" as they write. That is, they are Stone Age Britons of 3,500 years B.P.
   c. In addition, each student should include relevant information from the essay on megaliths.

6. It is difficult to award Survival Stones to any single person or band in such a cooperative venture as this one; however, you can overcome this difficulty if you tell students to evaluate their own contribution to the class construction project.
   a. At the bottom of their journal entries, have all students write an honest personal assessment, awarding themselves up to ten Survival Stones.
   b. Later, staple these assessments together by band and factor the average number. *Example:* 7 + 8 + 9, + 4 + 7 = 35 divided by 5 = 7 Survival Stones for that particular band.

Log rollers and pullers learn that cooperation is essential to move the heavy stones to the building site (using twine, paper towel cores and only one hand).

Teaching Tip →

Students learned to "pull together" to get the work done.

7. Finally, you might want to have a brief discussion about the merits of the megalith construction activity, what the students learned about megaliths in general, and about what human skills and traits it took to work on such an awesome and difficult project. Students in the two classes that pilot tested this Megaliths Passage mentioned over and over in their evaluations the teamwork required, the difficulty in transporting and lifting the stones into place, and the amount of planning required. Are there any better lessons for students to learn?

8. Tell students that their "found" poems are due at the next class meeting. Before the day ends, rearrange the room into its normal configuration.

DAY 3: "FOUND" POEMS

1. Students will share their "found" poems with the rest of the class.
   a. Have students stand and read their "found" poems.
   b. Praise them and award Survival Stones to bands whose members exhibit poetic and artistic talent.
   c. If you chose to have students use the "FOUND" POEM TRILITHON, cut out the poems and display them in the room somewhere, linking them together in a continuous line.

2. Your visual learners in class will appreciate your showing a video on Stonehenge.
   - *Secrets of Lost Empires: Stonehenge* (NOVA special)
   - *Stonehenge: Secrets*
   - *Who Built Stonehenge?*

3. Before you leave this passage and go on to the final Passage, remind students of the deadline for their Stone Age tool-making assignment.

Teaching tip →

This first video is longer than the other two, but shows modern Britons trying to duplicate the transportation and lifting of the sarsen stones, an excellent companion to the just-completed activity.

Nearing completion after the efforts of "thousands" of workers over "centuries," our Stonehenge begins to resemble the majestic monument we see today.

MYSTERIOUS STONES OF PREHISTORY - 1

Silent sentinels

Nothing has been more fascinating through the last four millennia than the stone structures called "megaliths" (Greek: *mega* means great, large; *lithos* means stone). These Stone Age sentinels stand silent today, yet their mere presence holds us moderns in awe. We wonder *why* were they built and, more importantly, *how* they were built by crude prehistoric peoples still dressed in furs and using mostly stone tools.

> "… reminding us of our prehistoric past and mysteries we cannot solve."

Mysterious monuments

Most megaliths, thousands of them, dot the landscapes of western Europe and the British Isles; however, they also exist as far away as Polynesia. Of all of these, the most famous and apparently most complex is Stonehenge, which lies in ruins in England, a huddle of gray slabs. Nevertheless, Stonehenge represents all megalith monuments in reminding us of our prehistoric past and mysteries we cannot solve. Furthermore, the presence of the megaliths throughout the world makes us ponder what these stones meant to the men and women who planned their construction and then incredibly moved stones, some weighing up to 50 tons, over miles of uneven terrain for reasons about which scholars still debate.

A megalith "race"?

By definition, a megalith is "a monument made of one or more large, roughly dressed stones standing either separately or in a group forming an obvious structure." Over the years, antiquarians and others have been intrigued, just as we have, by these great stones. Scholars have tried to fathom their origins and purpose. In the 18th and 19th centuries, some scientists theorized that all megaliths were related and probably constructed by a common megalithic race of extraordinary people who spread out from an Egyptian hub or center. A closer examination of the stone structures during the 20th century, however, reveals that megaliths throughout the world exhibit different building techniques and widely varying design patterns.

Types of megaliths

Four types of megaliths have been identified: the **menhir**, or single-standing stone (one in France is more than 30 feet high); the **stone circle**, of which Stonehenge is the best example; the **alignment**, or stone rows; and, the **chamber**, or stone room. The British Isles have the most vivid examples of the stone circle type; the Stonehenge and Avebury structures are the best known. Alignments also exist in southwest England, but the best examples of stone rows lie in northwestern France at Carnac, where several miles of parallel rows lead to semicircles of stone. The last type of megalith, the stone chamber, is actually a large tomb where up to 200 to 300 people might be buried.

"… between 5,000 and 4,800 years B.P. …"

Many builders … many years

Determining the historical time when most of these megaliths were fashioned is difficult. Estimates, based on archaeology and dating techniques, range widely, but construction on Stonehenge probably began somewhere between 5,000 and 4,800 years B.P. and "finished" about 3,200 years B.P. Archaeological excavations, especially since 1950, indicate that there were three main building periods, Stonehenge I, II, and III, built over the years mentioned. Work on other monuments in western Europe seems to parallel the years at Stonehenge.

A weathered relic

"The freedom to roam is the freedom to trample …"

The 82 enormous stones which made up Stonehenge's original circles are unique among the thousands of monuments constructed by prehistoric people. Many of our questions concerning this megalith's uniqueness will never be properly answered because, in large part, these Stone Age Engineers left no written record to guide us. To be sure, these circular stones are smaller, much smaller, than the pyramids of Egypt or even an American football field. Yet, the attraction is nearly the same. Located on sloping hills 80 miles west and south of London, England, on a hub of Salisbury Plain, a visitor can see the famous ring of stones on approach from one to two miles away. Today many of the stones have toppled and lie in ruin. Nonetheless, tourists who have seen it, including the authors of **BONES & STONES**, are thoroughly impressed and even awe-struck. Over the centuries, wind and weather deterioration, and human desecration ("The freedom to roam is the freedom to trample" wrote one) have combined to make it a fascinating relic. The authors recall visiting Stonehenge for the first time, in 1970, and watching their two young daughters—three and seven years old—climbing all over the half-buried, reclining sarsen stones that make up Stonehenge's outer ring. No more. The monument is now fenced off, limiting the thousands of annual visitors to visual admiration and photographs.

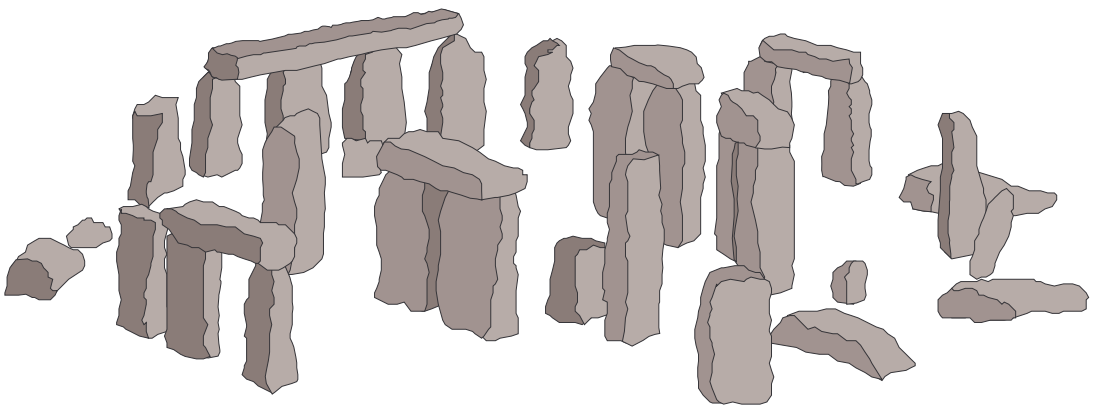
Giants, Merlin, Druids

Certainly one of the persistent mysteries surrounding Stonehenge is … just who built it? We may never know for sure. Legends abound regarding its designers and builders, even a theory about a race of giants achieving the feat. Other researchers, including some in this century, give credit to various magicians, including the most famous magician of all—Merlin of King Arthur fame. Architect Inigo Jones, commissioned by King James I, made the first survey and scientific examination of Stonehenge and concluded that Romans occupying Britain built it. Like many before him, Jones ruled out the early Britons, whose ancestors were the actual builders, dismissing them as "uncouth, ignorant savages." Other theories give building credit to the Druids, an ancient sect of Celtic priests, a belief fueled by the fact that modern Druids worshipped at the monument until recent times. Also considered to be the force behind Stonehenge's planning and construction are Atlantans, Phoenicians, Greeks, and even American Indians!

The real builders

Only in the last 100 years have scientists been able to zero in on the real builders of Stonehenge. In the early years of the 20th century a gale-force wind blew down a standing stone and focused attention on protecting and renovating Stonehenge. Subsequent excavations to restore the monument to its original state uncovered much of what we know about the real builders. These digs revealed some of the tools used by these people, specifically flint axes, hammer stones, and deer antler picks. A few Greek-like bronze daggers were unearthed in 1953, indicating that these toilers were mostly Neolithic Stone Age people, not using metals yet, but stone, bone, and wooden tools. Yet, even with this archaeological evidence, pinpointing the creative geniuses who conceived Stonehenge and the people who built it remains pretty much the mystery it was a century ago.

> "… not using metals yet, but stone, bone …"



How did they build it?

> … to the pyramid building in Egypt …

Imagine the physical ordeal of building Stonehenge. The first part of the project was digging the ditch and building up the banks around where the stones would be placed. Stonehenge I, *c.* 3,800 years B.P. probably took 100 diggers and 200 carriers 35 days to complete. As impressive and as difficult as these tasks were, the next job was truly Herculean. The stones themselves, some weighing up to 50 tons, had to be transported from Wales, as far as 240 miles away, over frequently wet and muddy terrain. Once at the henge site, workers had to shape the stones and then put them into place with a mathematical precision that never fails to impress later scientists. Certainly, comparisons to the pyramid building in Egypt come to mind.

Cutting and shaping the stones and then moving them along on barges over water and on log rollers and ropes over ground was equally as challenging. Getting the stones upright took ropes and levers. Since most of the stones are trilithons, that is, three stones in the post and lintel formation, a further challenge was raising the lintels to fit snugly on the knobs, or "bosses" on top of the two posts. Layers of logs added under the lintel one at a time was probably the technique utilized. Gerald Hawkins, an astronomer and Stonehenge scholar, calculated with a computer back in the 1960s that the entire construction took perhaps thousands of workers one-half million days of labor over three centuries!

Stonehenge decoded

> … an astronomical instrument to predict the movements of the sun and moon …

Extraordinary as its construction was, the original purpose of Stonehenge remains another one of its secrets, perhaps the biggest secret of all. This frustration among scientists continues to generate much scholarly speculation and often heated debate: *Was it a monument for religious services? Was Stonehenge connected to celestial observations? Are we giving it too much analysis?* Maybe an artistic engineer liked the exactness and design of the circular stones. The controversy over these enduring questions heated up in 1965 with the publication of Gerald Hawkins' book, *Stonehenge Decoded*, in which the Harvard astronomer concluded "with almost perfect probability" that Stonehenge was used by Stone Age Britons as an astronomical instrument to predict the movements of the sun and moon, as well as their eclipses. In effect, it was a huge calendar and observatory, marking the one major day of the year, the summer solstice (around June 21). Further, the British-born Hawkins wrote that Stonehenge served as a source of personal power for priests who used the sunrise to predict eclipses and such.

> No one will ever have a clue about what its significance was.

Hawkins under attack

While Hawkins did have a legion of supporters for his theories, he also had to face critics who questioned his measurements and calculations and thus his conclusions. One foremost Stonehenge archaeologist called Hawkins' work "slipshod" and "unconvincing." Hawkins himself welcomed much of the debate over his opinions, in part, because it raised more questions about the monument's purpose than it answered, something a scientist can appreciate. Perhaps a fitting word on why Stonehenge was built comes from archaeologist R.J.C. Atkinson: "Most of what has been written about Stonehenge is nonsense or speculation. No one will ever have a clue about what its significance was." Thus, Stonehenge will continue to tantalize scientists and layperson like.

Building your megalith

Because Stonehenge is the most famous megalith and because it was built by prehistoric Britons in the New Stone Age when people had no written language and used tools mostly fashioned from stone, bone, and wood, (elsewhere, it is true, river civilizations in Egypt, Sumer, India, and China were clearly beyond the Stone Age in development), Stonehenge will be the model and prototype for your activity in Passage ~~III~~. All members of all bands will come together as a clan and work jointly to carefully design and build a replica of Stonehenge. Therefore, get ready to haul those heavy stones over log rollers to a site where you'll construct your own example of the world's most admired megalith!

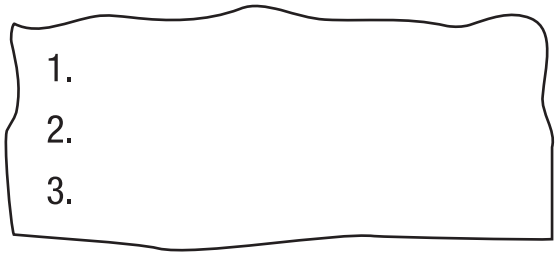
Learning Tip

Stonehenge imitations made of old cars— "Autohenge" and "Carhenge"— were built in Nebraska and near Lake Ontario, the latter constructed for a Chrysler Company advertisement which ended with the tag "… everything else is history." As of this writing, both structures still stand.

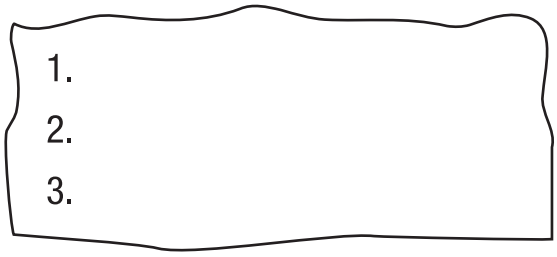
Nearing completion after the efforts of "thousands" of workers over "centuries," our Stonehenge begins to resemble the majestic monument we see today.

MEGALITHS SIGN-UP ROSTER

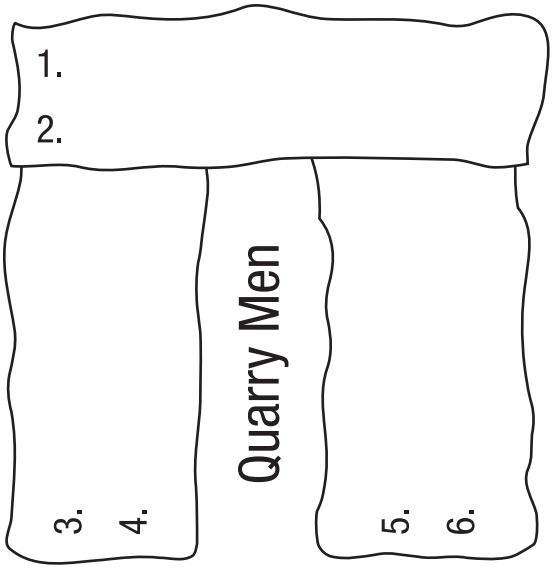
Period: _____

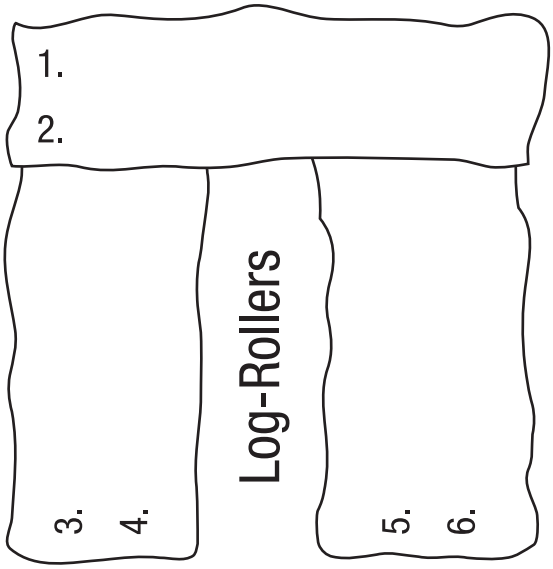


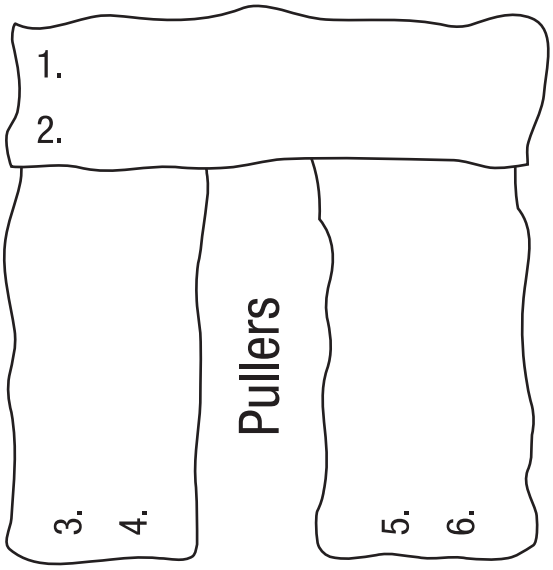
Engineers

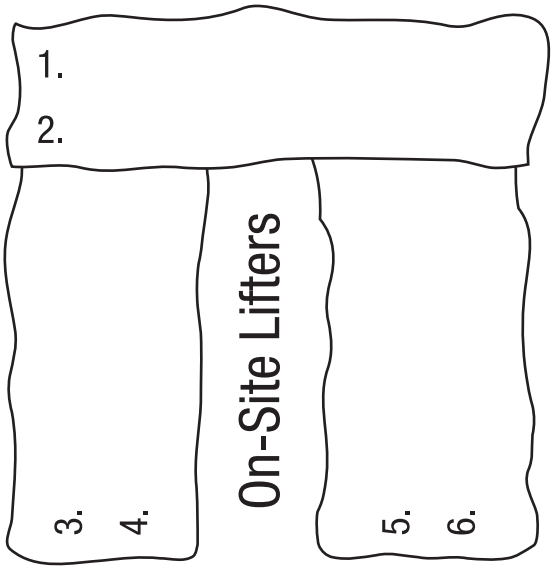


Stone Spacers









GUIDELINES FOR "FOUND" POEMS

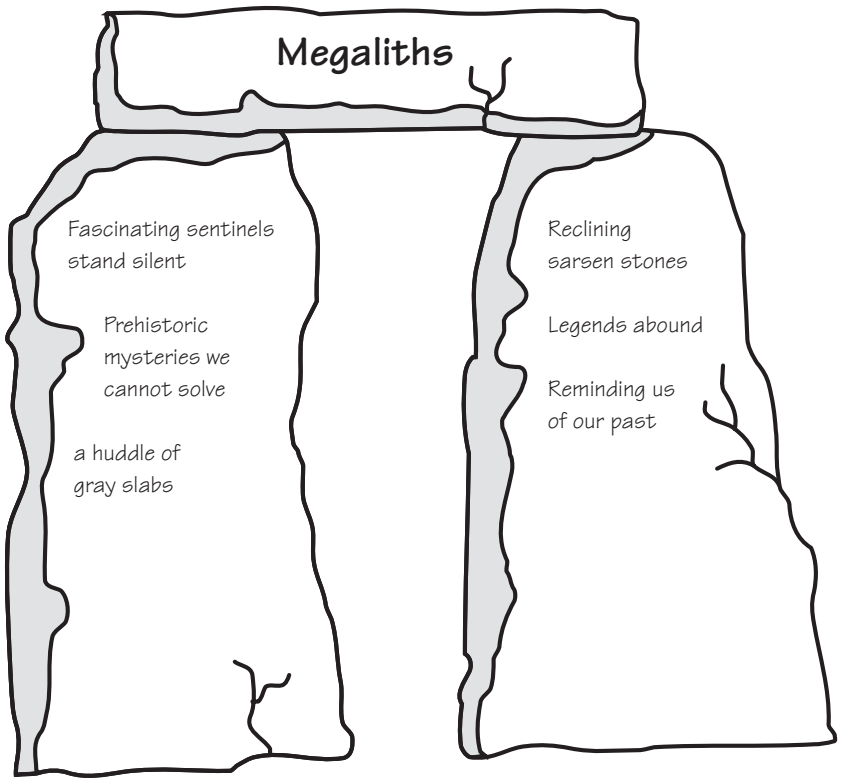
Introduction

1. A "found" poem is a method of summarizing a data sheet, essay, or primary source you have consulted.
2. Reread the MYSTERIOUS STONES OF PREHISTORY essay. Pay particular attention to the paragraphs about the Stonehenge megalith. "Find" some important, lyrical <u>impact</u> words, phrases, or ideas.
3. Your "found" poem will consist of these words, phrases, or ideas from the essay, arranged to communicate what you find important or interesting.

Rules

1. Your poem will be 10 to 15 lines in length.
2. Most of your lines will be no more than four to five words long.
3. Add <u>no</u> words to the "found" lines.
4. You may repeat words for emphasis or effect.
5. You may leave out words from the phrase, or line you have "found." You may even have lines that are only one word long.
6. You may put lines in any order.
7. Complete at least two drafts before finishing your poem.
8. Illustrate your poem.
9. Use color, shading, or other artistic techniques to highlight your poem's meaning and subtleties.

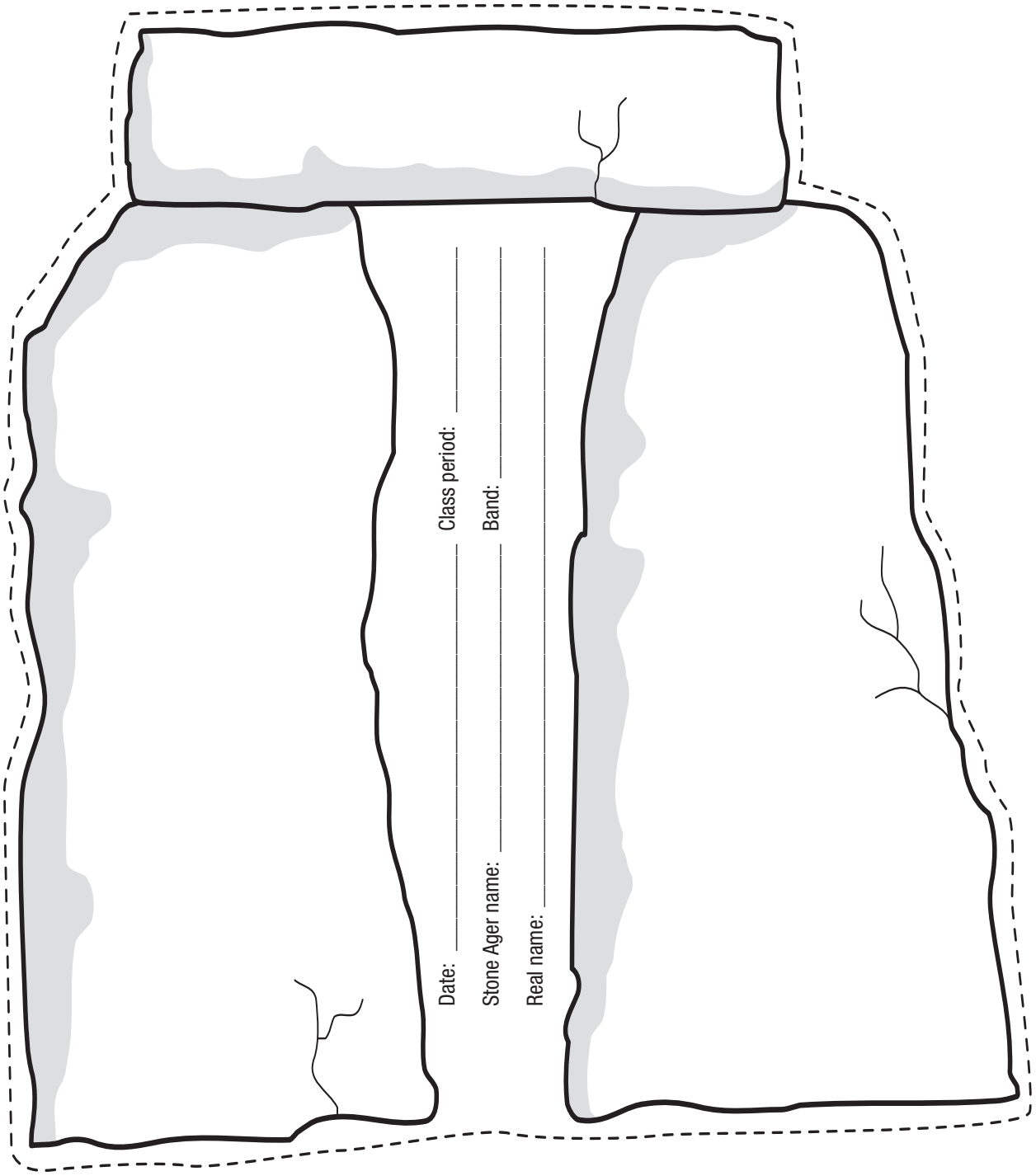
Sample "Found" Poem



"FOUND" POEM TRILITHON

Directions:
Use the GUIDELINES FOR "FOUND" POEMS as you compose your own "Found" Poem. Print your final copy neatly and creatively on these two pillar sarsen stones and one lintel cap.

Once done, cut along the broken lines and turn it in for evaluation. Your poem may be placed on display. ***Good luck!***



> "… you Engineers have an awesome responsibility."

Directions

Along with one or two others, you are an engineer in charge of your clan as all members labor together to construct a replica of Stonehenge, that famous circle of mammoth stones in southwest England. Those simple Britons living on the Salisbury Plain performed an amazing feat of finding, transporting, shaping (dressing), and raising the weighty stones (some weighing up to 50 tons) into circles of megaliths without the use of tools and machinery we have at our disposal today. Compared to the work required on the original stone structures 4,000 years B.P., the job your construction crews face is somewhat easier. You have already read an essay about the origins of Stonehenge. To help everyone in your class to appreciate what was done four millennia ago, you Engineers have an awesome responsibility. You are the project's bosses. Prepare yourself by doing the following:

1. Read and understand the contents on the ENGINEER'S BLUEPRINTS. Think carefully how you will locate the necessary building materials and how the class and school might finance the money ($20 to $25?) needed to cover the project's costs. Consult with your teacher and school administration if your teacher does not have the materials from using **BONES & STONES** during a previous year.

2. Think about and then decide where you Engineers and your workers will build your megaliths. Pick an appropriate site which will accommodate the measurements mentioned on the ENGINEER'S BLUEPRINTS. Keep in mind that the room or outside area you utilize needs to be large enough for three to four quarries, each of which must be 12 to 15 feet away from the actual building site.

Log Rollers and Pullers learn that cooperation is essential to move the heavy stones to the building site (using twine, paper towel cores and only one hand).

Skilled lifters maneuver the heavy lintel into place (using only one hand) after Engineers have precisely measured the stone monument's circumference.

Spacers calculate the exact distance (4") between the inner circle's trilithons, a task necessary for the monument's wondrous symmetry.

"Think ahead how you can prevent any needless accidents …"

3. Check with your teacher when you are ready to give specific tasks to your fellow Stone Agers. Then with your teacher's assistance, write students' names on the MEGALITHS SIGN-UP ROSTER. Be wary of certain combinations of students. Some students working together might become unproductive and hence jeopardize the efficiency of all the work to be done and the appearance of the final product. Your goal: ***To build your class replica of Stonehenge swiftly and make it look like the real thing!***

4. Think ahead about how you can prevent any needless accidents with the heavy stones, avoid arguments and brick knock-downs, and, in general, facilitate all your workers finishing this job.

5. Be familiar with the MEGALITHS CONSTRUCTION DUTIES and study the GUIDELINES FOR CONSTRUCTION CREWS very carefully. In every way encourage your work crews to follow the rules. These guidelines exist to make the project simulate the building of Stonehenge realistically, with as much learning and enjoyment as possible.

6. **Final comment**: If you Engineers are prepared and can lead, you will experience the satisfaction a teacher feels whenever he/she has organized a learning activity that "clicks." The result? Students aren't even aware of how hard they are working and how much they are learning. You'll see on their faces the happiness that comes from working together and successfully completing a challenging task.

GUIDELINES FOR CONSTRUCTION CREWS

Do your individual job on time and do it well.

Note: Post, duplicate, or read to all workers.

1. All workers must work hard at their jobs. No one may stand around and watch until the last lintel cap is placed on the last two pillars. Then it will be a time of rejoicing by shouting: **"HIP, HIP, HOORAY!"**

2. All workers are responsible only for the tasks which they have chosen or been assigned, unless Engineers direct them to make a job change.

3. All workers, beginning with Quarrymen, and including Pullers, Log Rollers, On-Site Lifters, and Stone Spacers, may use only one arm and hand to do all their work. Thus, cooperation with other workers' single hands is essential. However, workers may change arms and hands at any time.

4. No workers may lift stones by themselves, with or without twine.

5. The original measurements by the mathematically gifted Engineers are vital to the eventual symmetry and exactness of the stones.

6. Workers need to move the stones from the quarries continuously. Gawking at the talents and skills of others—On-Site Lifters, Stone Spacers, and Engineers—can only slow down the process. *Do your individual job on time and do it well.*

7. If a sarsen stone falls at any time, it must be lifted with twine cooperatively by two workers and put back in place.

8. When workers roll stones within 12 inches of the chalkline circles, they must then use twine to raise pillars and lintels into place. Lever tools are to be used only for "fine-tuning" the stones into place and elevating the stones so that twine can be placed under them.

9. Make sure the inside horseshoe of five trilithons is in place before too much of the outer circle of sarsen stones is complete. And be careful, for excited or careless workers might knock down stones which have been correctly placed.

10. If you are a worker involved in quarrying or transporting the stones and complete your job early, check with the Engineers to see if you can help space, lift, or inch into place the stones. However, do not get in the way of others.

11. Be careful at all times. Make sure you do not in some way hit other workers with stones or lever tools. The stones are heavy and have fairly sharp edges.

MEGALITHS CONSTRUCTION DUTIES

Engineers
(two or three)

1. Locate and bring in (with the help of your teacher and classmates) lever tools, string or twine, (maybe bricks), paper towel cores, tape measure, wood dowels.
2. Fill jobs with skilled and loyal workers.
3. Measure and draw the outer circle and the inner horseshoe using a string compass and chalk. Continually monitor the correct placement of the sarsen stones.
4. Motivate workers.
5. Supervise all facets of construction.
6. Physically help out wherever help is needed.

Quarrymen
(four)

1. Remove the sarsen stones from their quarry positions with twine.
2. Using twine, place these sarsen stones on top of log rollers.

Pullers
(four to five)

1. Use twine to pull the sarsen stones (which are on top of the log rollers) from the quarries to the construction site.

Log Rollers
(eight to 10 total/
two per sarsen stone)

1. Remove the back logs as sarsen stones pass over them.
2. Then place the log in front of the stones so sarsen stones continually roll forward towards the construction site.

On-Site Lifters
(four to eight)

1. Once the sarsen stones have been brought to the construction site, (no closer than 12 inches) pairs use twine to lift the stones off the log rollers.
2. Once again using twine, pairs raise the sarsen stones into place in the inner horseshoe or outer circle.

Stone Spacers
(two to three)

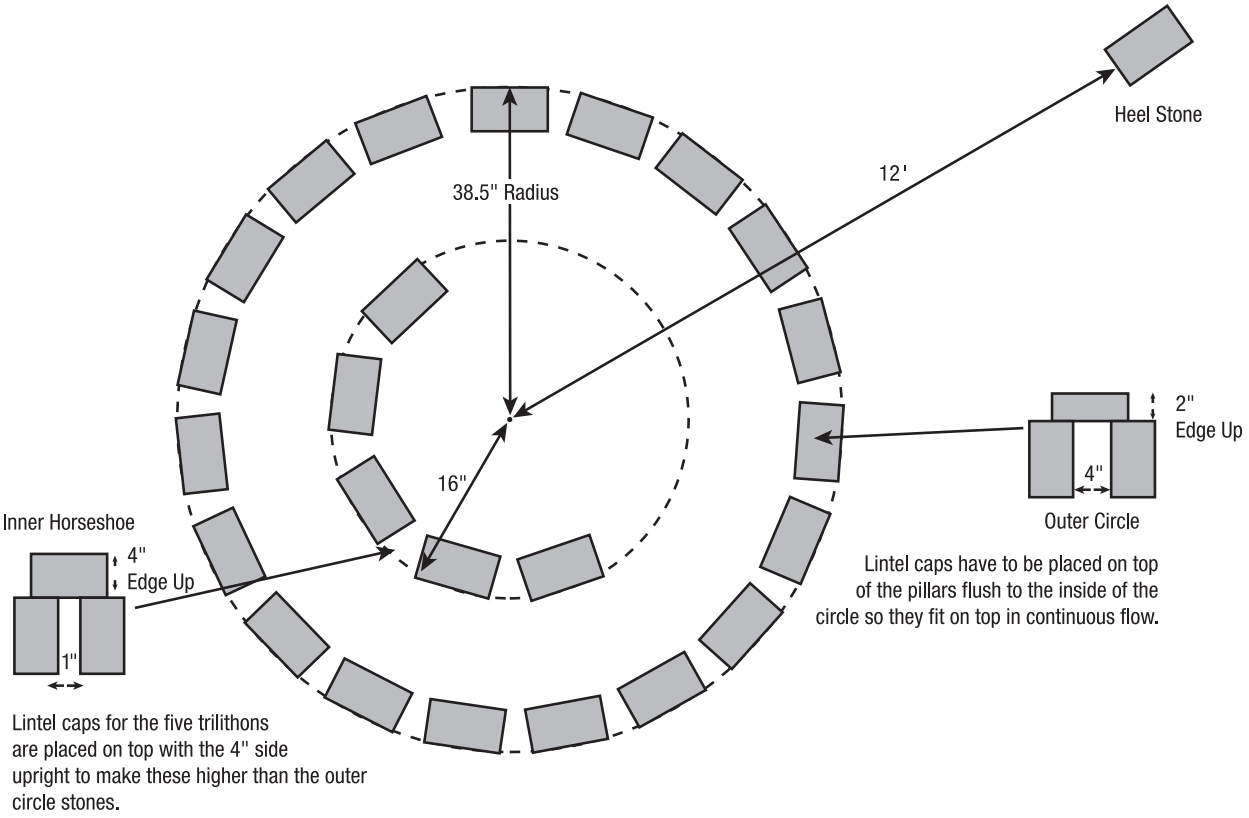
1. Use pieces of wood dowel to accurately determine the distance between the pillar stones.
2. Use twine and lever tools to ensure that stone pillars are exactly one inch apart in the inner horseshoe and exactly four inches apart in the outer circle.

Materials:

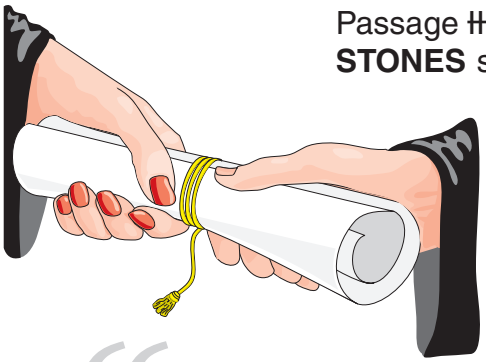
- Gray cement bricks (8" × 4" × 2")—*76*
- Twine or string—*one spool or ball*
- Paper towel cardboard cores—*50 distributed among the quarries*
- Lever-like tools—*10 to 15 for the On-Site Lifters*
- Chalk—*two to three pieces*
- Tape measures (one cloth to measure the radius)—*three to four*
- Wood dowels (4" × 0.5")—*four to five*

Measurements:

- The five inner horseshoe trilithons are 16" out from the center mark, placed equidistant to form the horseshoe pattern. They are open to face the heel stone which is exactly 12' from the center mark.
- The radius of the outer circle measures 38.5" to the outside of the bricks. Use chalk and a string compass to mark the circle.
- The outer circle is made up of 30 bricks standing on end and 30 bricks that form the lintel caps.
- The sarsen stones around the outer circle are exactly 4" apart.



It is presumed that cement bricks are a standard size around the country. If not, make any necessary adjustments to the measurements.



Passage ~~III~~ I: Conference provides proper closure for this **BONES & STONES** simulation: it ties up loose ends, and celebrates with food and beverages the experiences and learning gained. Students leave the Stone Age and return to a university setting where they demonstrate their prehistoric toolmaking skills with a display the results of the assignment given during Passage II: Survival. Then, as doctoral candidates at Graystone University, they take both their "orals" (an oral review of the subject matter in the five previous passages) and their written "comps" (a final examination on the subjects reviewed in their "orals"). Finally, deserving students are granted a degree (Doctorate in Prehistory) at an impressive graduation ceremony.

> … deserving students are granted their degrees (Doctorate in Prehistory) …

Flourishes

1. Stage the exhibit of their homemade tools in a multipurpose room or some other venue away from your familiar classroom. Obviously, doing this will create a special feeling for the exhibition.

2. Encourage students to dress up for both their presentations and for their graduation ceremony. Option: real or simulated black robes and mortar board hats.

3. Find a recorded version of *Pomp and Circumstance*, that familiar classical selection played throughout the decades at American graduation ceremonies. Play it over speakers as students come into the room just before they receive their doctoral degrees.

4. Consider having your robed principal hand out the diplomas to students as you read the candidates' names during the ceremony.

5. Consider preparing and reading small cards that highlight each student's experiences with **BONES & STONES** as the diplomas are handed out. In addition to the candidate's name, include his/her Stone Ager name and band affiliation, the tool he/she exhibited, and emphasize some personal achievement. Such information will enhance the value and enjoyment of the commencement ceremony. See Day 5 or 6: Graduation for more information.

6. Use your own or your students' creativity to make a large banner to display during graduation. Here is an example:

Teaching tip →

Make every effort to have your principal or other school administrator "do the honors" at graduation. It adds a nice formality to the entire proceedings.

Bringing a fitting closure to the entire simulation is important. Consider seriously including these flourishes for the graduation ceremony.

Graystone University
Good Luck! Class of 1999

7. A post graduation tea reception is a fitting tribute and flourish with which to end **BONES & STONES**. Solicit help from parents to provide this elegant conclusion for the graduation ceremony. Volunteers can provide cups, saucers, spoons, sugar, cream, cookies, cakes, napkins, table cloths, etc. You will also need volunteers to prepare and help serve the tea and refreshments.

Setup: Before Day 1—Finding an Exhibits and Graduation Room

1. In order to make this passage special, arrange to use a room other than your classroom for the exhibits and graduation ceremony.

2. Make students aware that this passage is about exhibiting and demonstrating their toolmaking skills, taking their "orals" and written "comps," and graduating. Here is the sequence of activities in Passage ~~IIII~~ I of BONES & STONES:
   a. Tool exhibit
   b. Toolmaking presentations and demonstrations
   c. "Orals" (Spoken review of testable material from entire simulation. A quiz bowl or Academic League format is suggested.)
   d. Written "comps" (Final examination)
   e. Graduation ceremonies (Doctorate on Prehistory degrees are granted, and individuals and bands are honored for garnering the most Survival Stones and for other achievements.)
   f. Tea and cookies (Optional)

Teaching Tip →

Perhaps a flyer home, or a very clear calendar posted on your front boards help to clarify the sequence of events during Phase ~~IIII~~ I

If possible, make an exam "blue book" for each student by stapling his or her pages of the exam inside a blue construction paper folder.

Duplication

Duplicate the following **Master Pages** (quantity in *italics*):

- COMP CARDS—*two to three sets*
- COMPREHENSIVE FINAL—*class set*
- CANDIDATE SUMMARY—*class set*
- GRAYSTONE UNIVERSITY DIPLOMA—*class set or one per graduate*

Materials

- Butcher paper for a banner (5' to 6')—*one*
- Poster paints or markers—*one set*
- Note cards (4" × 6")—*class set*

DAY 1: TOOLMAKING EXHIBITS AND PRESENTATIONS

1. If you have decided to award Survival Stones for Passage ~~III~~: Megaliths, do so now.

2. Day 1 can be used as a pick-up day for text work, videos, etc., prior to the toolmaking exhibit.

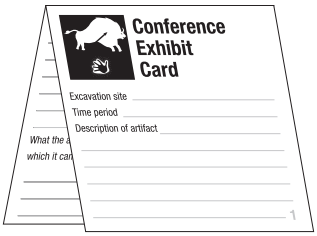
3. Arrange the room (either your classroom or a special use room) for this activity and assist as students set up to exhibit of their tools.

4. Allow at least 10 to 15 minutes for students to stroll the exhibits area as you supervise, compliment, and view the variety of homemade tool items.

On exhibit at an annual paleoanthropologist conference is a bow-drill fire starting tool, moot testimony to the skills of our hominid ancestors.

Teaching tip →

The order in which students present is probably not important; however, eagerness by a few of your best students might be a reason to apply the volunteer system here.

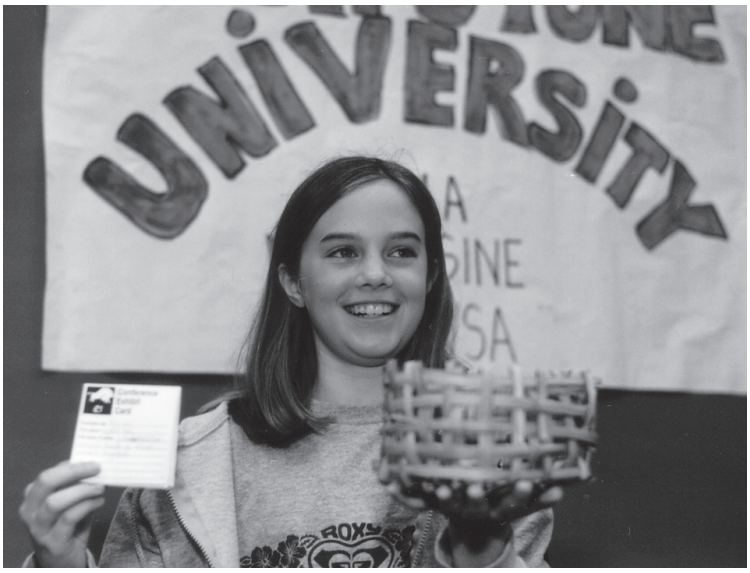


5. Seat everyone and then go over the guidelines for students' presentations
   a. Before the first presenter begins, establish the pattern for all presentations.
   b. Presentations should last two to four minutes.
   c. Review the specific evaluation points on the CONFERENCE EXHIBIT/EVALUATION CARD that you will use to determine how many Survival Stones to award for each presentation.
   d. The presenting student hands you a completed CONFERENCE EXHIBIT/EVALUATION CARD while walking to the presentation zone.
   e. For each presenter, you complete panel #4 on the EXHIBIT/EVALUATION CARD. Award Survival Stones to each student after his/her presentation.

6. Proceed through as many presentations as you comfortably can.
   a. Encourage questions from the presenters' peers. Ask some questions yourself.
   b. Plan on at least four to six presentations on this first day.

Where you have your exhibit and how much space you have in this room may determine the routine of the presentations.

7. Before you dismiss class, quickly evaluate and summarize the presentations given today.



Hoping to impress her fellow paleoanthropologists, one doctoral candidate presents her Stone Age artifact.

DAYS 2–3: COMPLETE EXHIBITS AND PRESENTATIONS

1. Review again the evaluation points on the CONFERENCE EXHIBIT/ EVALUATION CARD that you're using to determine how many Survival Stones you will award.

2. Continue with the presentations.

3. If this activity requires a third day, prepare to adjust and make changes for what you've planned.

DAYS 3-4: "ORALS"

1. If you want to award any extra Survival Stones for really outstanding presentations and/or toolmaking skills, do so at this point.

Teaching Tip →

Select those questions you feel are fair for what your students learned and experienced … and will be accommodated within the limited time you set aside for an oral review.

2. Students will now complete their "orals" review in preparation for their upcoming written "comps." COMP CARDS have been provided which cover materials presented during the various **BONES & STONES** Passages.

During the review, keep score by bands on the front board.

3. As a student and teacher you have experienced or used many methods to review for a unit exam. We recommend for **BONES & STONES** a format in which one representative from each band participates as a member of a panel of prehistory scholars. This can be staged in a college bowl or Academic League quiz format, as a competition between the bands to demonstrate knowledge learned.
   a. You, the teacher, or two student leaders, should be the quiz master, who presides over the review proceedings by asking the questions from the COMP CARDS, plus any questions you've devised from your text and other learning materials.

b. Proceed through several questions, imitating the quiz show patter and format you've probably seen on TV or at your local schools.
c. After eight to 10 questions, change the entire panel by bringing in new representatives from each band.
d. Follow this pattern until you've gone through all COMP CARDS or until the class ends and all students have participated.

Teaching tip

Try to get commitments from enough students to cover the food needs of an entire class.

4. If you have time after your oral review, sign up students to bring in food (cookies and small cakes) and beverage (tea or punch?) for the graduation ceremony coming up in a few days.

5. During the class period, hand out the Graystone University CANDIDATE SUMMARY.
   a. Explain its purpose, what students must do with it, and when it is due (the day on which graduation will occur).
   b. Tell students that at the proper time you will check off the line signifying that each has passed the written exam and tool-making presentation to qualify for the doctoral degree.
   c. Also, you will date and sign the bottom of the CANDIDATE SUMMARY when it is returned to you.

6. Before you dismiss students, exhort them to study tonight all of the materials from **BONES & STONES**, their text, and any other assignments they've done during the unit. Anything's fair game!

Day 4 or 5: Written "Comps"

1. We have provided a COMPREHENSIVE FINAL exam on early humans.
   a. Give a quick review of some essentials. Examples: sequence of early hominids, evolution of language and hunting skills, significance of fire mastery, Stonehenge, cave art, etc.
   b. Distribute the exam blue books for the "comps" exam if you have fabricated them.
   c. Administer the COMPREHENSIVE FINAL exam, allowing most of the period for students to complete it.

2. If you need a day between the exam and graduation, schedule one of the videos recommended in the Introduction on page 15.

3. You may want to give make-up tests to students who were absent or ones who failed to pass the first time.

4. An answer key for the COMPREHENSIVE FINAL is on page 6:8.

Day 5 or 6: Graduation

Before graduation day, make sure you have organized your day the way you want it to be. Here are some suggestions:

1. At least one week before
   a. Ask your principal to come to your graduation and hand out doctoral degrees to your students.
   b. Arrange for students to dress up, and have black robes for at least you and your principal.
   c. Arrange for and set up a room for the graduation ceremony and, if you choose, a reception with refreshments afterwards.
   d. Sign up students to bring in food (cookies and small cakes) and beverage (tea or punch). Try to get commitments from enough students to cover the food needs of an entire class.

2. At least two days before
   a. Have students fill out a 3" × 5" or 4" × 6" card with personal information that will be read at the time diplomas are individually awarded.

Teaching Tip

Have students copy a prototype from the board onto their note cards.

   b. The card should include candidate's real name, Stone Ager name, band affiliation, personal highlight from any passage of **BONES & STONES**, and tool exhibited. (See example)
   c. Of course, this is more entertaining than a typical formal graduation brevity and could be more time-consuming. You decide whether you have the time.

"**Tyler Hancock** … **Blix**, of the Stone Canyon band … **Blix** designed and exhibited the Cave broom tool. **Tyler** says he will always remember his role as the wacky hunter in the oral language scenarios."

Proud of meeting the rigorous challenges of BONES & STONES, two graduates receive their Degree (Doctorate in Prehistory) from author Barbara Lacey.

Teaching Tip →

Special recognition for certain bands and individuals could be enhanced by playing the triumphant musical theme from a movie such as Rocky*, and giving out some rock candy. Consider, too, having band winners go through graduation first.*

3. Consider writing and delivering a short introduction to graduation at the start of the ceremony. Here is an example:

   "Ladies and gentlemen … and graduates of the class of _____ . We are gathered here today to honor these men and women about to go forward to pursue their professional lives as scholars of our human past. They have all passed through rigorous examination and cutting edge experiences dealing with … "(etc.)

4. Play the host/emcee yourself or arrange for an honored guest to impressively read the doctoral candidates' names as they come forward to receive their diplomas. The presenter will read from the cards that the students had prepared earlier.

5. Mention, award, and recognize individual students and the band who earned the most Survival Stones while involved in the simulation. Those who earned the most Survival Stones do deserve to be mentioned and applauded.

6. Praise your students for their cooperation, energy, and hard work throughout the simulation.

7. Conclude with an inspirational thought and a good luck wish, thank everyone, and, if you have planned a tea reception afterward, invite the graduates and friends to the tea.

8. Try to arrange an opportunity during or near the conclusion of the reception to thank all who helped.

Pictured above is one of the two classes of sixth graders at Sowers Middle School in Huntington Beach, California, who met the "rigorous challenges of BONES & STONES" as it was pilot tested during the 1997-98 school year. Both authors wish to acknowledge and thank them for their cooperation, enthusiastic participation, and valuable feedback, enduring along the way carpet burns on their knees, one or two bumps on their heads, paint on their clothes, and the blinding light of flash photography.

COMPREHENSIVE FINAL ANSWER KEY

Part I

1. x
2. x
3.
4. x
5.
6. *Australopithecus*
7. *Homo habilis*
8. *Homo erectus*
9. Neanderthal
10. Cro-Magnon
11. Change
12. Cro-Magnon
13. France and Spain
14. *Homo habilis*
15. Language/speech
16. to 20. **Answers will vary.**

    Among those animals hunted are: lions, mammoths, baboons, horses, elephants, bison, ibex, reindeer, auroch, boars, fox, caribou, wolves, goats, bears, lizards, hares, fish, seafood, etc.
21. to 25. **Answers will vary.**

    Among those plants gathered and eaten are: fruits, nuts, seeds, beans, root, tubers, stalks, bulbs, berries, melons, leaves, fungi, flowers, clover, mint, grubs
26. to 35. **Answers will vary.**

    A good essay on fire will include:

    Cook their food

    Keep them warm

    Keep large predators away

    Extend the waking time by providing light during the night

    Promote speech development and "culture" during leisure hours after sundown

Part II

36. b
37. a
38. f
39. a
40. b
41. e
42. a
43. b
44. d
45. e
46. to 50. **Answers will vary.**

Part III

Requires students to respond to an evaluation of the simulation and therefore is ***not*** part of the examination.

COMP CARD	COMP CARD
1. Paleoanthropologists Louis and Mary Leakey found and classified what Genus Species? **Answer**: *Homo habilis*	**5.** What are the scientists who study man or humans called? **Answer**: Anthropologists
COMP CARD	**COMP CARD**
2. Which prehistoric people were thickset, muscular, and had protruding faces with large brow ridges? **Answer**: Neanderthal	**6. True or false:** The searching, discovering, piecing together, and cataloging of bones, tools, and utensils is the sole effort of one archaeologist. **Answer**: False (It's a team effort.)
COMP CARD	**COMP CARD**
3. Who were the first modern people? (They were known as "the artists of prehistory.") **Answer**: Cro-Magnon	**7.** What is evolution? Define it simply. Then give one example. **Answers may vary**: slow, orderly change … An example is that children evolve into adults.
COMP CARD	**COMP CARD**
4. Which particular scientists search for <u>artifacts</u> left behind by humans and then use this evidence to explain how early humans lived? **Answer**: Archaeologists	**8.** During modern times (since 1800) who is credited with developing "the theory of evolution"? **Answer**: Charles Darwin

COMP CARD

9. Name the book Charles Darwin wrote to explain his "theory of natural selection."

Answer: *The Origin of Species*

COMP CARD

10. Explain the five steps of the scientific method which scientists use.

Answer:

a. Identify a problem b.Make a hypothesis
c. Conduct experiments
d. Observe results e. Draw conclusions

COMP CARD

11. "Hominid" refers to:

a. fossils
b. one-celled ocean creatures
c. scientific groupings of human beings and prehistoric human-like creatures.

Answer: c

COMP CARD

12. Remains of australopithecines have been found in:

a. western and southern France
b. eastern and southern Africa
c. northern Spain

Answer: b

COMP CARD

13. Donald Johanson nicknamed his discovery of a human-like skeleton after which popular Beatles song?

a. "Hey Jude"
b. "Lucy in the Sky with Diamonds"
c. "Eleanor Rigby"

Answer: b

COMP CARD

14. What made australopithecines human-like?

Answer: They walked upright and lived in groups.

COMP CARD

15. *Homo habilis* translates to mean what in English?

Answer: "Handy man" or "man who makes and uses tools"

COMP CARD

16. Living on Africa's savannas, what helped *Homo habilis* to survive the hostile environment?

a. increased intelligence
b. ability to make tools
c. lived in social groups d. all of these

Answer: d

COMP CARD

17. *Homo erectus* translates to mean what in English?

Answer: "Upright man"

COMP CARD

18. Which genus species was the first to harness and use fire?

Answer: *Homo erectus*

COMP CARD

19. To come upon a group of Neanderthals in their habitat, one would notice that they relied on their:

a. physical strength
b. artistic ability
c. superior intelligence

Answer: a

COMP CARD

20. *Homo sapiens* translates to mean what in English?

Answer: "wise man" or "thinking man"

COMP CARD

21. All human beings now living on earth are descendants of:

a. Neanderthal b. *Homo habilis*
c. australopithecines d. Cro-Magnon

Answer: d

COMP CARD

22. Which of the following had time to create a Stone Age "culture," design and make jewelry, stitch clothes with needles, and paint scenes on cave walls?

a. australopithecines
b. *Homo habilis* c. *Home erectus*
d. Neanderthal e. Cro-Magnon

Answer: e

COMP CARD

23. Name the scientist who developed a list of qualities that define humans as unique from other species.

Answer: Dr. Carl Sagan

COMP CARD

24. Name at least three edible plants in early humans' diet.

Answer: Nettles, Mint, Wheat, Seeds, Berries, Grubs, Nuts, Roots, there may be others.

COMP CARD

25. Name five animals hunted during the Paleolithic Age that we do not hunt and eat today, for whatever reason.

Answer: Auroch, Cave Bear, Woolly Mammoth, Cave Lion, Woolly Rhinoceros (these are all extinct)

COMP CARD

26. Over time what factors made hunting easier and more successful?

a. ability to communicate with words
b. better weapon technology
c. cooperative effort
d. all of these

Answer: d

COMP CARD

27. Select the best answer: Planning the stalking and killing of animals must have promoted …

a. language development
b. bravery
c. physical strength

Answer: a

COMP CARD

28. Name three weapons used to capture and kill animals on a hunt.

Answer: spears, large stones, bolas, slings, bows and arrows

COMP CARD

29. Name three significant changes brought about once fire was mastered.

Answer: cooked food, kept people warm, defense against large predators, and light

COMP CARD

30. Describe and explain the use of a spear-thrower.

Answer: A device made of antler bone or wood, hooked onto the spear's end to improve leverage exerted as the hunter's arm is thrust forward

COMP CARD

31. What are the two methods hominids used to start fires?

Answer: flint struck against stone (igniting tinder with sparks); friction using wood or bow drill

COMP CARD

32. *Homo habilis* is credited with making the first stone tools known as:

Answer: "pebble stones" or "choppingtools"

COMP CARD

33. For what might a flint hand axe be used?

Answer: butchering animals and digging up edible roots, tubers, etc.

COMP CARD

34. What might you find in a Cro-Magnon tool kit? Name at least three things.

Answer: needles, points and awls, knife, burin, tools with carved bone and antler handles.

COMP CARD

35. For what purpose would someone use a leister, gorge, stone weights, and nets?

Answer: for catching fish

COMP CARD

36. **True or false:** Only humans have the ability to speak to one another using words.

Answer: True

COMP CARD

37. Name three ways language changed early *Homo sapiens*?

Answer: Enabled them to share information, work together, and pass on knowledge

COMP CARD

38. Vandalism, murder, birth defects, and domestication of wild animals were four Cave Court Cases studied. Name the other three.

Answer: Breaking tradition, stealing food, and refusing to go away to die.

COMP CARD

39. Over 100 painted caves have been found in France and Spain. Name two famous locations.

Answer: Lascaux and Altamira

COMP CARD

40. Which of the following is not depicted on cave walls in Spain and France?

a. stags, cattle, and goats
b. engravings and abstract designs
c. outlines of flying saucers
d. bison, boars, and horses

Answer: c

COMP CARD

41. Cave paintings pigment colors were made from an oxide mineral which comes in different shades of:

a. white, charcoal, purple
b. green, yellow, blue
c. red, yellow, brown

Answer: c

COMP CARD

42. All of the following could be used as a fixative or binder for cave art pigments except:

a. water
b. iron oxide
c. blood
d. animal fat
e. egg white

Answer: b

COMP CARD

43. How were hand prints usually made on the cave walls?

Answer: Stenciling (dabbing on paint or painting over a shape or hand) or paint blown through a tube made from bone or reeds

COMP CARD

44. **True or false:** Most likely, the entire cave painting process in one location was the single effort of one chosen artist.

Answer: False (group effort, with perhaps a master artist)

COMP CARD

45. What might be an explanation for missing fingers found on many of the hands painted on cave walls?

Answer: Fingers cut off as part of a ritual or ceremony

COMP CARD

46. **True or false:** Cave paintings were produced over a short period of time.

Answer: False (over thousands of years)

COMP CARD

47. Most cave paintings are found:

a. near entrances of caves
b. in hidden places which are not easily accessible

Answer: b

COMP CARD

48. The most common explanation of ceremonies and rituals conducted within caves in association with paintings on the wall is

a. sympathetic magic
b. initiation rituals

Answer: a

COMP CARD

49. From what continent do scientists think our earliest ancestors originated?

Answer: Africa

COMP CARD

50. "Sympathetic magic" is

a. renderings of abstract designs on cave walls
b. herbs used for healing
c. the belief that this ritual would guarantee a successful hunt

Answer: c

COMP CARD

51. From earliest to most recent times name the correct sequence of prehistoric hominids.

Answer: *Australopithecus*, *Homo habilis*, *Homo erectus*, Neanderthal, Cro-Magnon *(Homo sapiens sapiens)*

COMP CARD

52. Which of the following appropriately describes the components of early human speech?

a. gestures b. body language
c. short sentences resembling "baby talk"
e. all of the above

Answer: e

COMP CARD

53. True or false: Stonehenge was built about 3,500 years B.P. by one generation of prehistoric people.

Answer: False

COMP CARD

54. True or false: It is quite possible that Stonehenge was a prehistoric astronomical observatory marking the summer solstice each year.

Answer: True

COMP CARD

55. Stonehenge, the most famous megalith structure in the world, is located in:

a. Norway b. France
c. Italy d. England

Answer: d

COMP CARD

56. Scientists now believe that Stonehenge was built by:

a. Merlin's magic
b. a race of giant Druid priests
c. wandering Greeks
d. simple prehistoric farmers

Answer: d

COMP CARD

57. True or false: Stonehenge is only one of many similar stone structures built by prehistoric people in western Europe and the British Isles.

Answer: True

COMP CARD

58. The word "megalith" means what in Greek?

a. heavy stones
b. gray rocks
c. huge or large stones
d. "rocks that speak"

Answer: c

COMP CARD

59. About how heavy was each sarsen stone transported to and raised at Stonehenge?

a. 5-10 tons
b. 200-300 tons
c. 25-50 tons
d. 2 tons

Answer: c

COMP CARD

60. Three stones in a post and lintel configuration are called a:

a. megalith
b. trilithon
c. parallel
d. lever

Answer: b

COMP CARD

61. For most Americans under the age of 50, probably the most popular but inaccurate image of prehistoric man is:

a. Alley Oop
b. Ringo Starr
c. George Jetson
d. Fred Flintstone

Answer: d

COMP CARD

62. Many of the sarsen or blue stones used to build Stonehenge came from as far away as:

a. France
b. Scotland
c. Wales
d. China

Answer: c

COMP CARD

63. Up to the 1950s which early hominid ancestor was characterized unfairly as an ignorant brute?

Answer: Neanderthal

COMP CARD

64. Which of these animals was not painted on cave walls by Cro-Magnon artists?

a. reindeer
b. horses
c. monkeys and apes
d. bison

Answer: c

COMP CARD

65. Which qualities below were important in building Stonehenge?

a. communication skills b. cooperation
c. physical strength d. cleverness
e. all of the above

Answer: e

COMP CARD

66. What was used to transport the huge Stonehenge stones from their source to the site?

Answer: huge barges over water … log rollers with ropes over land

COMP CARD

67. What is the most famous megalith built by prehistoric people that is circular in shape and that is found in England?

Answer: Stonehenge

COMP CARD

68. The first skeletal remains of Cro-Magnon people were unearthed in:

a. Germany b. Argentina
c. Italy d. France

Answer: d

COMP CARD

69. Which is *not* an appropriate label for our early ancestors?

a. cavemen b. hominids
c. *Homo erectus* d. *Homo habilis*

Answer: a

COMP CARD

70. What scientific test was done on the fossilized remains of Neanderthals to prove that this species is *not* our "common ancestor"?

Answer: DNA analysis

COMP CARD

71. Which is *not* true about Cro-Magnons?

a. They are us.
b. They come just before Homo erectus.
c. They painted cave art.
d. They wore needle-sewn clothes.

Answer: b

COMP CARD

72. True or false: If the entire Earth's history were measured on a year calendar, the earliest "humans" have been around less than a day.

Answer: True

COMP CARD

73. True or false: Paleoanthropologists can deduce much about a prehistoric human by examining a skull, femur, or mandible.

Answer: True

COMP CARD

74. True or false: Most anthropologists become famous because of their extraordinary finds when they out "in the field."

Answer: False. Most labor without celebrity or fame.

COMP CARD

75. True or false: Charles Darwin's book *The Origin of Species* had little impact during the years he was alive.

Answer: False

COMP CARD

76. True or false: Until *Homo sapiens sapiens* early humans were probably scavengers, feeding on animal flesh killed by other predators.

Answer: False. As early as *Homo erectus*, hominids were successful hunters.

COMP CARD

77. True or false: Prehistoric people probably ate a more varied diet of animal and plant sources than we eat today.

Answer: True

COMP CARD

78. What is the meaning (the definition) of B.P. when these written letters follow prehistoric dates?

Answer: "Before Present"

COMP CARD

79. Which early hominid seems acceptable as an ancestor to modern humans to both creation "scientists" and paleonanthropologists?

Answer: Cro-Magnon *(Homo sapiens sapiens)*

COMP CARD

80. True or false: For most of their time on this planet, humans have spent most of their daily hours as either hunters or gatherers.

Answer: True

COMP CARD

81. True or false: Using a spear-thrower with a spear guaranteed early hunters more distance but not more accuracy in bringing down an animal.

Answer: False (it improved accuracy, too)

COMP CARD

82. True or false: Modern vegetarians are an exception, but most humans have always had meat as a major part of their daily diet.

Answer: True

COMP CARD

83. True or false: If today we observed a band of *Homo erectus* "talking" among themselves we would comment that they sound like young children.

Answer: True

COMP CARD

84. True or false: Much of prehistoric life was organized around important cooperative activities like hunting, gathering, and cooking.

Answer: True

COMP CARD

85. What is meant by this pithy statement? "Man made tools, and tools made man."

Answer: Answers will vary.

COMP CARD

86. True or false: Several dramatic discoveries of prehistoric human bones over the past 75 years have made the general public more aware of and receptive to noteworthy events in anthropology.

Answer: True

COMP CARD

COMP CARD

COMPREHENSIVE FINAL - 1

Name: _____ Date: _____

Part I

(**1.** to **5.**) Under the **Fire** column, place an **X** in front of the name of the hominid if this particular hominid mastered the use of fire.
(**6.** to **10.**) Under the **Ancestors** column, write in chronological order the names of our prehistoric ancestors.

Fire			Ancestors
1.	_____	*Homo erectus*	**6.** _____
2.	_____	Cro-Magnon	**7.** _____
3.	_____	*Australopithecus*	**8.** _____
4.	_____	Neanderthal	**9.** _____
5.	_____	*Homo habilis*	**10.** _____

11. **Circle** the most appropriate word below for a **synonym** (word that means the same) for the word "evolution."

change controversy durable regional revolving flexible

12. Which one of our ancestral hominids above is actually *Homo sapiens sapiens* (like us)? _____

13. In which European countries can the best examples of prehistoric cave paintings be found? _____ and _____ .

14. Which one of our ancestral hominids above is known as "handy man," our ancestor who first made and used crude tools? _____

15. What single important development in early human history allowed our human ancestors to share information, to work and hunt cooperatively, and to pass on knowledge and wisdom to future generations? _____

_____

_____

Name: _____ Date: _____

(**16.** to **25.**) In the spaces below write the names of five animals our ancestors hunted and five edible plants our ancestors gathered for food.

	Animals		**Plants**
16.	_____	**21.**	_____
17.	_____	**22.**	_____
18.	_____	**23.**	_____
19.	_____	**24.**	_____
20.	_____	**25.**	_____

Essay paragraph (**26.** to **35.**)

How were our ancestors' lives changed once they learned how to master and use fire?_____

_____

_____

_____

_____

_____

_____

_____

_____

Part II

Circle the letter of the correct answer.

36. Scientists have concluded that early humans first appeared on which continent?

a. Asia
b. Africa
c. Australia
d. North America
e. Europe

37. What colors were used most often in prehistoric cave painting?

a. red, yellow, and brown
b. green, white, and blue
c. white, charcoal, and purple

Name: _____ Date: _____

38. Louis and Mary Leakey, Richard Leakey, and Donald Johanson are famous for being …
   a. archaeologists
   b. "fossil-hunters"
   c. historians
   d. paleoanthropologists
   e. Both a and b
   f. Both b and d
   g. Both b and c

39. Early prehistoric people roamed and settled in groups of 20 to 35 called …
   a. bands
   b. clans
   c. teams
   d. squads
   e. contingents

40. Many traits separate different species. Which trait below is common to both primates and early humans?
   a. bipedalism
   b. signals, grunts, and gestures while communicating
   c. throwing spears and other projectiles accurately
   d. thinking about themselves and the future
   e. performing creative acts

41. According to recent paleoanthropological evidence, our earliest ancestors to walk upright or erect were
   a. Neanderthals
   b. *Homo habilis*
   c. *Homo erectus*
   d. Cro-Magnon
   e. *Australopithecus*

42. The idea that dinosaurs and early humans coexisted on this planet is …
   a. utterly false
   b. true
   c. a popular myth that may have some truth
   d. shamefully believed by more American adults than it should, despite scientific accuracy in Hollywood movies and TV programs

Name: _____ Date: _____

43. Which one statement about the hominids called Neanderthals is false?

a. For most of the last century they were stereotyped as big, dumb, cavemen.
b. They are directly related to Cro-Magnon people (and thus, to us) according to recent DNA studies.
c. They had a brain capacity equal to and maybe larger than modern humans.
d. Some suggest they lived at the same time as the Cro-Magnon, but were isolated from them.
e. They probably wore clothes and communicated fairly well with signals, grunts, and gestures.

44. Which one statement below about Cro-Magnon is false?

a. They invented language as we know it.
b. They created culture, showing artistic and musical talent far beyond hominid ancestors.
c. They are the first "modern" people and we all are descendants of them.
d. They are the first hominids to use something resembling tools.

45. Which one statement below is false about "Lucy," one of paleoanthropology's most sensational recent discoveries?

a. She was unearthed in Africa by a team led by David Johanson.
b. She was probably bipedal and walked erect.
c. She probably lived in a social group.
d. She probably looked a lot like modern humans rather than chimpanzees.
e. She was named for the Peanuts cartoon character popular in the 1970s.

46. to 50. Write down one tool or weapon invented by real prehistoric people. Also tell how it was used, and why this tool or weapon was an important factor in early human development.

Tool or weapon: _____

How it was used: _____

_____

_____

The importance of the tool or weapon: _____

_____

_____

_____

_____

Name: _____ Date: _____

Part III

This evaluation is not scored as part of your test.

Circle one of the words below that rate the **BONES & STONES** simulation as a learning experience then explain your rating in a brief paragraph:

poor **fair** **good** **excellent** **superb**

_____

_____

_____

_____

_____

_____

_____

Circle the one or two simulation activities below that you feel were the strongest learning experiences, then explain your reasons in two brief paragraphs.

- seminar presentations
- Stone Age diet
- toolmaking projects and presentations
- cave court situations
- hunting and gathering
- cave painting
- language scenarios
- building Stonehenge
- making fire
- spear throwing
- graduating and receiving a degree (Doctorate in Prehistory)

1. _____

_____

_____

_____

2. _____

_____

_____

_____

Graystone University
Graduate School

Candidate Summary for the Doctorate in Prehistory Degree
(This sheet must be completed and submitted before the degree can be conferred)

Candidate: _____ , M.A.

Major: Prehistory - Paleoanthropology

Band: _____

Checklist

❑ read all relevant required essays

❑ contributed to and cooperated with my band

❑ practiced thinking skills and worked creatively

❑ worked hard and long—beyond the basic requirements

❑ passed "orals" (oral reviews)

❑ passed "written comps" (written final exam)

❑ made, exhibited, and presented prehistoric tool

Candidate's statement

Write a brief personal assessment paragraph explaining your learning and accomplishments during the **BONES & STONES** simulation.

_____

_____

_____

_____

_____

_____

_____

_____

Date: _____

(Signed) _____

Dean of Graduate School

GRAYSTONE UNIVERSITY

THE TRUSTEES OF THE UNIVERSITY BY VIRTUE OF THE AUTHORITY
VESTED IN THEM AND ON THE RECOMMENDATION
OF THE FACULTY OF
THE GRADUATE SCHOOL
HAVE CONFERRED THE DEGREE OF

DOCTOR OF PRE-HISTORY

ON

_____

WHO HAS SUCCESSFULLY COMPLETED THE REQUIREMENTS,
GIVEN AT _____ (CITY), _____ (STATE), THE _____ DAY
OF _____ (MONTH), IN THE YEAR _____.

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PRESIDENT OF THE UNIVERSITY

Louise Brown Thayer
CHAIRMAN OF THE BOARD

GSU

_____
DEAN/ADVISOR

GRAYSTONE UNIVERSITY DIPLOMA

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Age of Student: _____ (print)

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