Grades 3-6

GOOD YEAR BOOKS

Differentiated Instruction in Science

Written by Barbara Doherty and Charlotte Jaffe

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- **Multiple Intelligences**
- **Learning Centers**
- **Flexible Grouping**
- **Learning Contracts**
- **Tiering**
- **Compacting**
- **Independent Investigations**

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Section I

Differentiation Strategies

Introduction to Differentiated Instruction

As teachers, we recognize that students are not all alike and that instruction must be designed to meet the needs of the diverse learners in our classrooms. Differentiating instruction is a way to utilize the strengths and interests of all our students as we plan lessons for them. By providing varied educational opportunities, we can increase the chances for their academic success and make learning a rewarding and challenging experience.

According to Carol Ann Tomlinson, an associate professor at the University of Virginia and an authority on differentiating instruction, teachers can differentiate the following classroom elements based on student readiness, interest, or learning profile:

Classroom Elements

- **Content**
  Content is what the student needs to learn. It is usually based on school-district curriculum or national standards.

- **Process**
  Process is the method the teacher uses to plan and teach the lessons.

- **Product**
  Products require students to demonstrate and apply what they have learned.

- **Learning Environment**
  Learning environment is the way the classroom looks—the arrangement of furniture and types of displays—and the types of instructional materials available to students.

Differentiation Strategies

- **Multiple Intelligences**
- **Learning Centers**
- **Flexible Grouping**
- **Learning Contracts**
- **Tiering**
- **Compacting**
- **Independent Investigations**

Applying Differentiated Instruction

By modifying the key elements—content, process, product, and learning environment—to suit the needs of our students, we can support individual learning requirements. Teachers should assume the roles of facilitators rather than direct instructors, by effectively organizing students for particular learning experiences. Students may work in a group, cooperate with a partner, or work independently. It is crucial to remember that these organizational patterns must remain flexible. When designing differentiated instruction, keep in mind that the instruction should always be fair and equitable. Higher ability students are sometimes merely assigned more of the same type of classwork to complete instead of being offered enrichment or higher level lessons. Students at all levels should be challenged with engaging and appropriate types of active learning experiences.

Before using differentiated instructional materials for their students, teachers must first gather information about the students. Academic assessments, such as tests, portfolios, and cumulative files, offer information about students' strengths and weaknesses. Interest inventories or student interviews provide clues to the things the students prefer and enjoy. Multiple Intelligence Surveys help teachers understand how students learn best. Classroom observations also reveal differences in learning needs. Talks with family members and other teachers may provide additional insight into determining what method of instruction is the proper match for each child.

In Section II, you will find a variety of strategies for differentiating your science instruction. The content that is used in the lessons is based on national standards requirements. Choose the strategy or strategies that fit best with the content that you are teaching and the students in your class.

In Section III, you will find a series of template pages to help organize students into categories based on their learning abilities and styles. The section also contains forms: a student contract to fulfil assignment requirements; and a teacher self-evaluation sheet. There are also organizational charts for teachers to use with the assignments in Section II, Lesson 6.

Multiple Intelligences

What Are Multiple Intelligences?

Educators have long believed that verbal/linguistic and mathematical/logical types of intelligence were the essential intelligences to possess. However, in 1983, Dr. Howard Gardner of Harvard University developed the theory of Multiple Intelligences. This theory greatly broadens the vision of intelligence. Dr. Gardner's identified intelligences are listed below.

- **Verbal/Linguistic Intelligence**
  This intelligence describes people who excel in reading, writing, speaking, and other forms of communicating.

- **Logical/Mathematical Intelligence**
  This intelligence describes people who excel at diverse mathematical skills, computer programming, scientific studies, abstract thinking, and solving problems logically.

- **Visual/Spatial Intelligence**
  This intelligence describes people who excel in visual perception; these people are often artistically talented.

- **Bodily/Kinesthetic Intelligence**
  This intelligence describes people who excel at using physical activity, such as in sports or in dance. They may be builders or performers. They express themselves through bodily movement.

- **Musical Intelligence**
  This intelligence describes people who excel at playing musical instruments, singing, composing music, and dancing; they possess a special sensitivity to sounds.

- **Interpersonal Intelligence**
  This intelligence describes people who excel at working with and cooperating with others. They communicate well and are sympathetic to the problems of other people.

- **Intrapersonal Intelligence**
  This intelligence describes people who excel at working alone. They have a good sense of themselves, their emotions, and their abilities.

- **Naturalist Intelligence**
  This intelligence describes people who excel in living with nature. They are sensitive to the needs and problems of the natural world, interact well with animals, and like to grow things.

Multiple Intelligences in the Classroom

The educational connection of multiple intelligences to classroom practices is that teachers should be aware of different types of multiple intelligence-based activities in order to engage all of their students in the lesson they are teaching. It is important to note that researchers agree that people who excel in one type of multiple intelligence usually excel in some other types as well. Most activities that people successfully complete require the combined use of several types of intelligences. Therefore, teachers must help students explore and develop many kinds of intelligences by designing lessons that focus on all types, not just the intelligence that is the strongest for each child. Most of us will never reach the height of Beethoven or Picasso, but we may improve our ability to create a musical composition or paint a picture.

Assessments may vary according to intelligences. Consider allowing choice in the method of assessment given at the end of a unit. For example, you might give the following direction: Write a play to show what you learned about the solar system or create a model to show how the planets revolve around the sun.

In Section II you will find examples of lessons using multiple-intelligence options.

Learning Centers

How Are Learning Centers Used?

Learning centers, sometimes called learning stations, offer a variety of opportunities to engage students in working independently or with a small group on differentiated activities. While involved in center activities, students can reinforce, apply, or extend skills that they have been taught. Centers can be designed according to student readiness, interest, or learning style. Therefore, it is important that the students be pre-assessed before starting.

These learning areas may also be called interest centers or learning stations. Learning centers can be permanent or portable. Usually the centers are set up in special areas of the classroom and contain a work surface, supplies, and instructions. However, some learning centers are created by organizing student desks in an appropriate configuration. After the center time is over, center materials can be stored in a folder, a manila envelope, or another type of container.

Learning centers may be scheduled at various times during the day or week, and the duration varies according to available class time. Sometimes it is convenient to schedule them at the same time as guided reading, allowing the teacher to work with small groups of students while the other students are involved in independent or group activities. At other times, you may want to devote the entire class period to learning-center activities so that all the students take part in the center projects.

Each learning center should have clearly worded rules and instructions for students to follow independently. Teachers also may include guidelines for students to self-check their tasks. Some teachers like to create task cards related to readiness, interest, or learning style for students to use. Directions for cleaning up, storing work, and expected behavior should be reviewed with students before beginning the learning-centers project.

Evaluation

Although initially it takes time to design a learning center, once it is completed, it can be used year after year, with easily revised variations. The proper evaluation tools are necessary to ensure that the students are learning successfully while participating in the learning-center activities. Some of them include ongoing observation checklists and anecdotes; review of portfolios of student work, project products, participation in sharing sessions; and tests. Students can be evaluated on a variety of learning skills in addition to academics; these include responsibility, cooperation, planning, and decision making.

Learning centers can be used to successfully accomplish differentiated instruction in classrooms from kindergarten through twelfth grade. Section II of this book contains a variety of learning-center activities.

Flexible Grouping

Applying the Strategy of Flexible Grouping

Flexible grouping is a valuable strategy to use when differentiating instruction. As with other types of differentiating techniques, it is necessary to get to know your students' strengths and weaknesses and likes and dislikes in order to appropriately place them in flexible learning groups. A student may have a higher level of readiness or interest in a particular area, but show weakness or lack of interest in another. Teachers can use a variety of instructional patterns to group and regroup students in order to provide the best learning experience for each of them. Students may be grouped in small or large collaborative groups or in pairs according to the particular learning task that they are required to do. At times, students may be put into groups depending on their learning style or their choice.

It is important to note that students who need extra practice or instruction on a particular learning skill might be grouped together, but once they have mastered that skill, they will no longer be part of that same group. If no longer needed, that group will be dissolved. Students will be placed in other instructional groups based on their special needs. Continuous assessment is necessary to evaluate student progress.

According to educational research, students should not be placed in static ability groups for long periods of time. Short-term, flexible groupings provide more learning opportunities for students of all abilities. They are more successful in helping students reach their individual achievement goals.

Learning Contracts

About Learning Contracts

Learning contracts are an effective way to differentiate a unit or a portion of a unit of study. Usually, background or introductory information is provided before the contract begins. In a learning-contract situation all students complete a set of activities. When these activities are completed, students complete another set of activities with different levels of complexity.

In some cases, there will be an actual contract that describes the responsibilities of the student; the contract is signed by the teacher, the student, and the student's parent or guardian. In this way, the parent or guardian is aware of the expectations. The first time you use learning contracts with your students, go over the directions, expectations, and activities carefully. Provide plenty of opportunities to stop student work and discuss the progress and any problems the students may have.

The Teacher's Role

- Allow plenty of time to get to know your students before beginning learning contracts.
- Gather resource materials on several different reading levels. The teacher will identify the academic objectives or outcomes of the contract activities as well as the affective-learning objectives.
- In a learning contract the teacher's role is one of support, encouragement, and facilitation.
- The teacher must also develop a schedule and evaluation methods for monitoring students' progress.

The Students' Role

- All students will have a deadline for completion of activities and projects.
- Students may work on the assignments at their own pace and in any order. Their most important responsibility is to work constructively.
- Students must keep a log of their daily work time and progress.
- Work must be kept in a folder in a central location and be accessible to the teacher.
- Students must ask for help when needed and not rely on the teacher to identify that they need assistance.

Tiering

How to Use Tiering to Meet Student Needs

Tiering is the leveling of the difficulty of the activities students will be asked to do. All students are capable of achieving the same learning goal if that goal is a broad one. The tiered activities are meant to follow whole-class instruction. You can usually meet your students' readiness and challenge levels by using three tiers of activities. While completing the tiered activities, the students will be using and extending the information and skills that had been presented earlier in whole-class lessons. Think of these activities as different ways for all students to reach the same basic understandings and goals of your lesson or unit.

The tiered activities can be color coded by putting them on differently colored sheets of paper or index cards, by putting colored dots on the cards or paper, or by filing them in differently colored file folders. Students will be asked to do the tiered activities after the more structured, teacher-led lesson is completed. Sometimes the tiered activities will be used as follow-up activities by which you extend or assess the learning that has taken place. These activities can be designed to be done independently, in pairs, or as small-group experiences.

When creating the tiered activities for your students, you must keep in mind students' abilities, the background information needed, the goals and objectives you hope to reach, the materials needed, and the time necessary to complete the activities reasonably. Also of importance is the method by which you will evaluate the work accomplished by your students.

Once you have designed tiered activities for a particular lesson or part of a unit, you can use them the next time you teach that topic by making a few accommodations. They can become the basis for other tiered activities and can be modified to suit the needs of your students.

Evaluation

As in all teaching, your assessments must be closely aligned with your goals. While students are working, you may circulate throughout the room, acting as facilitator, observing behavior, and noting the behavior on a checklist. Each activity need not be formally evaluated. By completing the activities, your students should be prepared to successfully perform well on a general quiz or test.

Curriculum Compacting

What Is Curriculum Compacting?

Compacting a curriculum is a method of differentiating that is determined by the ability or readiness of your students. In this method of differentiating, the time normally devoted to the objectives and activities necessary to achieve them is shortened. In other words, the pacing of the material is accelerated. Compacting encourages your students to become more independent and responsible for their own learning. It motivates students and can help to eliminate the boredom associated with drill and practice.

How to Compact

Determine which of your students are candidates for compacting by pretesting. Experts advise that a pretest should be an opportunity offered to the entire class. A score of 90 percent or better is usually accepted as mastery. Textbook publishers often offer pretests. A final test can also be used as the pretest. You may create a pretest of your own by using the questions at the end of a chapter or unit or by basing questions on the main ideas and concepts of the chapter or unit. Students who have scored at the mastery level will then be given an alternative, meaningful assignment. You will find many students interested in compacting. Keeping appropriate records will substantiate that the students have achieved the curriculum requirements.

Example of Compacting

Here is a practical explanation. We have all experienced those students in our classrooms who already know the spelling words in the weekly list before it is formally introduced. There is no need for these students to go through the regular weekly activities that support the learning of the words in the weekly list. These students may proceed to the next level of spelling. In some cases the student is tested through any and all spelling lists and may complete the usual (year-long) set of spelling lists in just a few months. They have completed the spelling curriculum.

These students are now free to pursue other areas of interest, receive additional instruction in a subject in which they need more help, or move on to spelling words of more complexity.

Independent Investigation

About Independent Study

The independent investigation agreement allows both teacher and student to identify the areas of interest that the student wants to explore. The independent study satisfies the student's curiosity, promotes work at advanced levels, and allows long-term, in-depth work on a topic of interest. The teacher and student together will create a plan of investigation and develop the types of activities that will be accomplished. There will be a written agreement signed by the teacher, student, and a parent/guardian. The teacher will facilitate the student's progress and provide resources when applicable. It is necessary to establish timelines and to plan progress checks at various intervals. Graphic organizers or work logs will allow both student and teacher to set up and maintain short- and long-term goals for time management.

Evaluation

Evaluation of independent study is usually in the form of a product. This product should make it evident that the student understands the original question, problem, or subject. The teacher should develop with the student a method of assessment that is clear and easily understood.

The product can be in the form of a report, a display, a PowerPoint presentation, a chart, a bulletin-board display, a story, a poem, a game board, or any other format agreed to by both the teacher and the student.

Section II

Differentiation in Science Lessons

Science Lessons

In this section of the book, five units are presented.

Units

- **Unit 1: Stormy Weather**
  Strategies: Tiering and Learning Centers
- **Unit 2: A Voyage around the Solar System**
  Strategies: Multiple Intelligences and Learning Contracts
- **Unit 3: Using Energy**
  Strategies: Tiering and Learning Centers
- **Unit 4: Habitats**
  Strategies: Multiple Intelligences and Learning Contracts
- **Unit 5: The Amazing Human Body**
  Strategies: Multiple Intelligences and Learning Centers

Tiered strategies are labeled according to readiness levels: A (Introductory), B (Intermediate), and C (Advanced).

Multiple-Intelligence strategies are labeled according to various learning styles.

Learning Centers are labeled according to interest. Materials are listed.

Learning Contracts are labeled according to level of difficulty: A (Basic) and B (More Challenging).

These are self-directed activities. Students may work independently or cooperatively to complete them. The lessons provided are samples. You may increase or decrease the complexity of each. Some activities require more than one class period to complete. Consider adding other types of differentiating strategies—compacting, independent investigations, or flexible grouping—that meet the needs of your students and enhance the skill lesson. Special resource materials, writing materials, and art supplies may be needed for some lessons. Suggested resources are provided at the end of the book. Please check websites before using them.

Stormy Weather

Hurricanes and tornadoes are very powerful storms that affect the lives of many people every year. It's important for students to understand the dangers associated with these storms and to learn the safety skills needed in order to survive one. In this unit, differentiation strategies for the study of Stormy Weather are modeled. The strategies are Tiering and Learning Centers. The tiering strategies support the lessons on hurricanes and are labeled according to readiness levels: A (Introductory Level), B (Intermediate Level), and C (Advanced Level). The learning-center activities support the lessons on tornadoes and are labeled according to interest. Materials are listed when appropriate.

The activities used with both strategies are self-directing and may follow a whole-class lesson. Students may work independently or cooperatively to complete them. The lessons that are provided are samples. The complexity of each lesson can be decreased or increased. Some activities require more than one class period to complete. In your classroom, consider adding other types of differentiating strategies to create activities that meet the needs of your students during the unit on Stormy Weather.

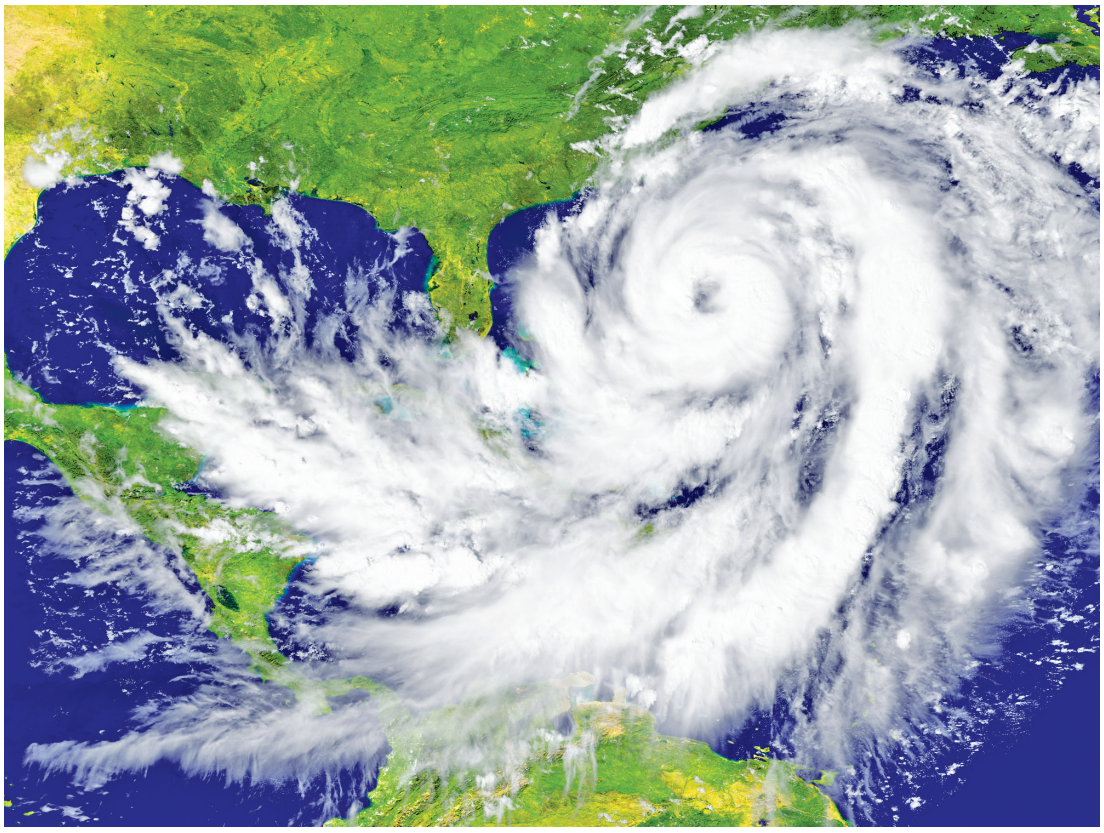


Image Sources: iStock/Harvepino

Name _____ Date_____

Hurricane Activity

Through the years, people in the Americas have experienced deadly and costly hurricanes. The hurricane season of 2005 was the most active season in recorded history. Research the internet and books and use the information to make a list of some of the most dangerous storms. Choose three storms and tell three facts about each. Some suggestions follow: What was the name of the hurricane? What was the location of the storm? How large was the hurricane? How did the hurricane form? What damage did the hurricane cause?

Write your information in the space below.

Selected Storms
Hurricane:
Fact:
Fact:
Fact:
Hurricane:
Fact:
Fact:
Fact:
Hurricane:
Fact:
Fact:
Fact:

Hurricane Awareness

We know that hurricanes are big storms with strong, spiraling winds that can cause enormous damage. Research and find out about the eye of the storm, the dangers of the storm surge, and the conditions that allow a hurricane to form. Also investigate the things that people can do to prepare for hurricanes.

Create a poster to educate people about hurricanes. Include some suggestions for preparing a disaster supply kit.

Name _____ Date_____

Hurricane Hunters

Hurricane hunters are people who work for a government agency called the National Oceanic and Atmospheric Administration. Their job is to travel through the storms in small planes that contain scientific equipment that measures different characteristics of the storm. Sometimes hurricane hunters fly into the eye of a storm to get information that will warn towns and cities that are in the hurricane's path.

In this activity, you and your partner are to pretend that you are hurricane hunters. Research the types of weather instruments that hurricane hunters carry on their planes and facts they might record about what they observe. Then turn your information into a hurricane report. Role-play hurricane hunters in a presentation to your classmates. Your presentation should provide them with needed hurricane information. Make it exciting as you give details of your courageous flight through a storm!

Hurricane Report

Caught in a Tornado

In May of 2007, the small town of Greensburg, Kansas, was destroyed by a powerful tornado. The tornado was almost two miles wide and had winds that moved at a speed of more than 200 miles per hour. The citizens of Greensburg only had a twenty-minute warning to seek safety from the ravaging storm.

Pretend that you are a citizen of Greensburg, Kansas, and that you are caught in a tornado. Take the role of any citizen: mayor, firefighter, teacher, housewife, student, police officer, doctor, and so on. Act out the exciting story of how you survived and what happened to the people or things you treasured most. How did you help to rescue them? Before performing, write out a brief scenario of your experience. Use art supplies to create "photos" of tornado-related scenes. Share these in your reenactment presentation to the class. You may wish to research some facts about the Greensburg, Kansas, tornado before starting the activity.

Facts to Include and Scenario Ideas

Name _____ Date_____

Unit 1: Stormy Weather

Topic: Tornadoes

Tornado Safety Booklet

Tornado watches and warnings are issued by the US National Weather Service. A tornado watch is issued when conditions are favorable for the formation of a tornado to alert people to the possibility of tornado development in their area. A tornado warning is issued when a tornado has been sighted in the area.

Before a tornado occurs, it's important to learn the safest places to stay in your home, school, car, or outdoors. For example, you should keep away from windows. When possible, it's best to wait out the storm in a windowless room, a closet area, or a basement.

Use resource materials or the internet to find information on tornado safety rules. Arrange your information in a booklet according to location (home, school, and so on). Your teacher will make copies of the booklet for you to give to family and neighbors. Illustrate the cover of your booklet. Write your notes in the spaces below.

Materials:
Resource materials/internet
Art supplies
Paper for booklets

Safety Rules
Home:
School:
Car:
Outdoors

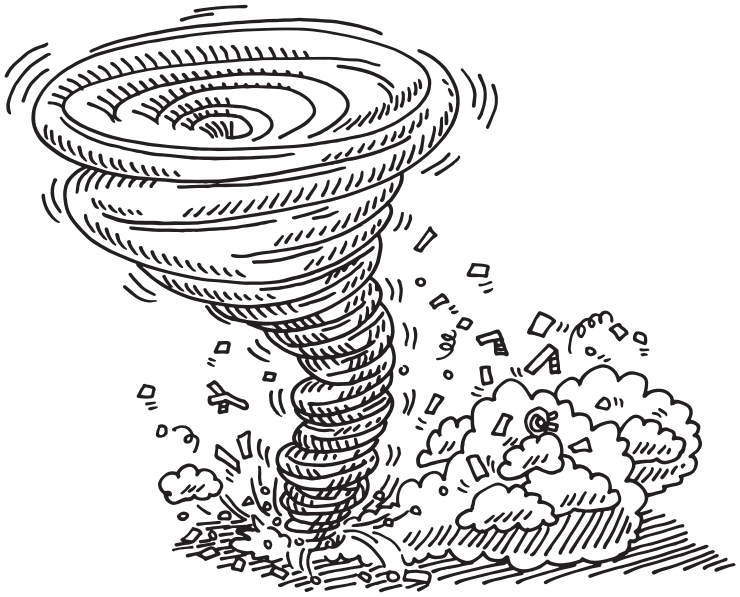
Create a Tornado

Here's a chance to experience a tornado in the safe environment of your classroom! Assemble the materials before you begin.

Materials:
Two 2-liter, clear and clean plastic soda bottles
1 roll of duct tape
Water
Food coloring
Metal washer
3″x 5″ cards and pencils

How to Make the Tornado

- Fill one of the plastic bottles about 3/4 full of water.
- Add some of the food coloring to the water for special effects.
- Secure the metal washer to the opening of the bottle.
- Now tum the empty bottle upside down and secure it to the washer and the first bottle.
- Wrap the duct tape around the washer tightly to fasten the two bottles together. Test the bottle for leakage.
- Make sure the bottle with the water is the top bottle.
- Twist or swirl the bottles until a tornado effect forms in the top bottle. The water will quickly move into the bottom bottle. Swirl slowly to create the funnel.
- On your 3" x 5" card, explain the results of your experiment.



A Voyage around the Solar System

People have always wondered about the mysteries of the solar system and have dreamed of journeying to other planets. Recent scientific developments have made that dream come closer to reality. The study of the solar system is a necessary part of every school curriculum. In this section of the book, two strategies for differentiating instruction in the study of the Solar System are modeled: Multiple Intelligences and Learning Contracts. The multiple-intelligence strategies support the lessons on space explorers. They are labeled according to various learning styles. The learning-contract strategies support the lessons on studying the solar system. Materials are listed when appropriate.

All students are required to do the activities in the first part of the contract. Next, students are assigned to either a level A (basic) contract or a level B (more challenging) contract. General directions are explained on page 26. Page 27 shows the expected outcomes for all students. The activities that students must accomplish are described on page 28.

The activities used with both strategies are self-directing and may follow a whole-class lesson. Students may work either independently or cooperatively to complete them. The lessons provided are samples. The complexity of each lesson can be decreased or increased. Some activities require more than one class period to complete. In your classroom, consider adding other types of differentiating strategies to create activities that meet the needs of your students during the unit on A Voyage around the Solar System.

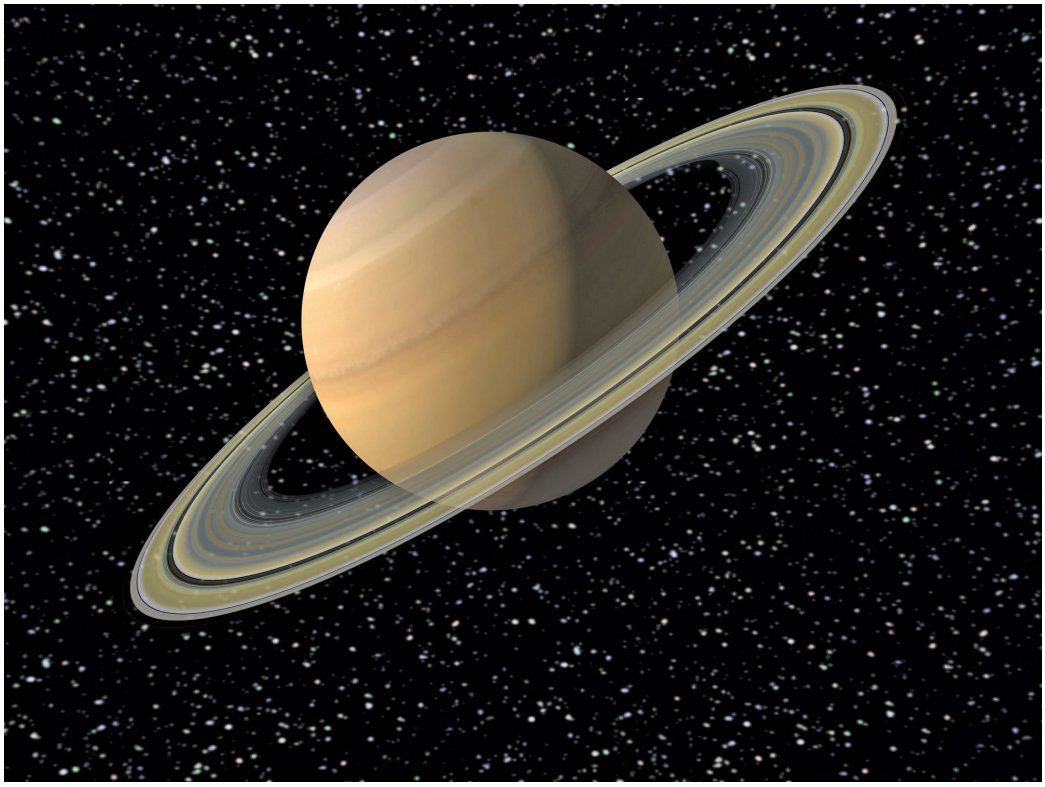


Image Sources: iStock/3quarks

Who Am I?

Throughout the history of America's space exploration program, there have been many outstanding people who have contributed to its success. Along with the astronauts, think about scientists such as Wernher von Braun, who is often called the father of the US Space Program.

Choose three people who influenced the development of the space program. Investigate their lives and their achievements. Then create three "Who Am I?" riddles for your classmates to solve. Here's an example:

Who am I?: _____

- I traveled on the *Freedom* 7.
- My first words after the flight were "Boy, what a ride."
- My ride into space lasted only fifteen minutes and took me 115 miles into space.
- I am remembered as the first American to pilot a spacecraft in 1961.

(ANSWER: Alan Shepard Jr.)

Who am I?:
1.
2.
3.
4.
Who am I?:
1.
2.
3.
4.
Who am I?:
1.
2.
3.
4.

Space Probes

Scientists use space probes to help them gather information about the solar system by conducting various scientific experiments. Space probes are unmanned missions that fly by, orbit, or land in a particular location. Some space probes carry rovers that are controlled by scientists back on Earth. The rovers can move across the surface of the location and gather important information. The information gets sent back to the scientists on Earth.

In this activity, you will work in a cooperative-learning group. With your group members, research information about a particular space probe and its accomplishments. Record the dates and planets visited by the probe. The other groups in your class will also each choose a space probe to research. Include a clear photo or picture of the space probe to enrich your research.

Examples of Space Probes

Voyager I and *II*
Mars Exploration Rovers: *Spirit* and *Opportunity*
Huygens probe
Pioneer 10 and *11*
Cassini probe
New Horizons

After gathering the needed information, your group will build a model of the space probe.

Possible Materials:
Tissue boxes
Milk cartons
Cardboard and construction paper
Toothpicks
Buttons
Plastic soda bottles
Discs
Balsa wood
Markers
Scissors
Paint
Glue

When your group report and project have been completed, share the results with your classmates. Learn why the probes have been so valuable to our exploration of space.

International Space Station

The United States and its partners, Russia, Japan, Canada, and several European nations, are in the process of assembling one of the world's most amazing projects—the International Space Station. In 1973, the United States launched *Skylab*, and Russia launched a series of space stations between 1971 and 1986. When completed, however, the International Space Station will be the largest manned object in space and will circle Earth every 90 minutes. International Space Station crews will conduct a variety of scientific experiments to improve life on Earth, and they will provide information about the long-term effects of living in space.

Learn more about the workings of the International Space Station using the internet, newspapers, and other research materials. Here are some questions to guide your investigation:

Explain the different components of the International Space Station?

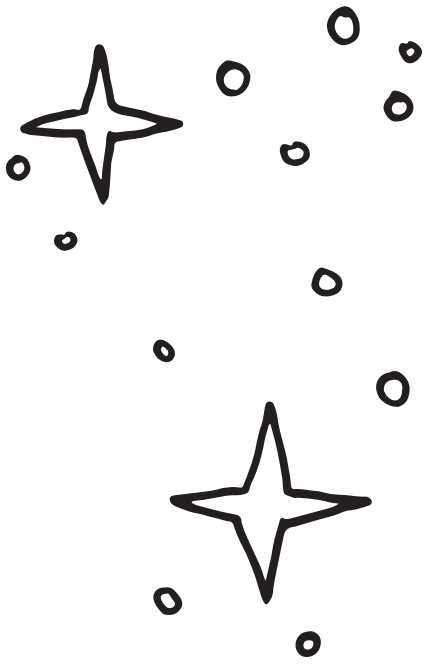
What does the International Space Station look like?

How will the astronauts be transported to the space station and how long will they be stationed there?

Why do the astronauts need a few hours a day of strenuous exercise while on the space station? How will this be accomplished?

How might the International Space Station enrich our future lives and bring the world together?

Create a poster advertising the construction of the new International Space Station. Illustrate it with a drawing of the space station and use your research information to add written details to the poster. Make it colorful and attractive. Perhaps it will encourage future visitors!



The Contract: How Does It Work?

As part of our "Voyage around the Solar System" you are going to complete some independent activities in class. This will help you understand the things we will be reading about and doing later.

Steps in Completing a Learning Contract

- Five class periods have been scheduled to complete the sections of the contract. You can do some of it as homework if you like. You may work on the activities if you have extra time in class. The references and other materials that I have gathered must be kept in the classroom.
- There is no order to the activities. You may complete them in any order as long as you focus on the work and are making progress. Keep all work in the folder provided. Let me know when you have completed each activity. As each piece of the contract is checked, I will initial the checklist on your folder. You might want to have a classmate check your work before handing it in. You may ask for help whenever you are having difficulty. I will be available to help you if I am not already helping someone else.

You may work anywhere in the classroom as long as you are being productive.

Do your best work. Your contributions will help us all as we complete our unit on A Voyage around the Solar System.

Voyage around the Solar System Learning Contract

Outcomes and Expectations

You should expect to know, understand, and be able to do the following as a result of your work:

Know . . .

- key vocabulary words, terms, and concepts about the solar system.
- the key points of each of the planets of the solar system, such as their locations and sizes.
- that humans have been studying and using the patterns of the sun, moon, and stars for thousands of years.

Understand . . .

- that humans rely on the sun, moon, and stars.
- that there have been different beliefs about the solar system.
- the likenesses and differences between the sun and the moon, and among the different planets.

Be able to . . .

- explain how the sun, moon, and stars influence our lives on Earth.
- use a Venn diagram.
- explain the causes of a solar eclipse.

Voyage around the Solar System

The Learning Contract

All students will complete the following activities. Then some will be assigned Contract A and some will be assigned Contract B.

Draw a diagram of the planets of the solar system in correct position to the sun. Label each planet.

- Define the following terms in a double-entry journal: planet, star, comet, asteroid, meteor, orbit, and solar system.
- Compare the sun and the moon using a Venn diagram.
- Explain what causes a solar eclipse.

Contract A

- Choose any one of the planets. Create a poster for it. Include an illustration or picture of it and five important facts about it to share with others.
- Explain how early humans used the sun, moon, and stars.
- Describe some of the early beliefs about the solar system, such as those of the ancient Egyptians or ancient Greeks.

Contract B

- Explain how patterns in the solar system affect our lives. Give two examples.
- Create a matching card game to teach others about the parts of the solar system. For each term or item use a pair of index cards. One of each pair will have the word or concept. The second card will have the explanation. Include a rules card.
- Learn about one of these early astronomers: Brahe, Copernicus, or Galileo. Write three important facts about whomever you chose.

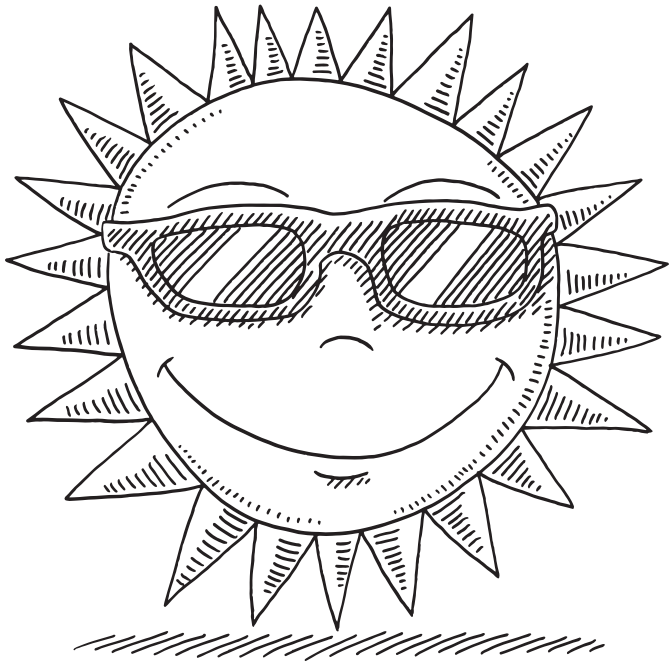
Using Energy

We use energy in many forms every day. Our bodies need and use energy even when we are sitting still or sleeping. Potential energy is energy that is stored up. Energy from the sun is stored in the plants we eat as chemical energy. When we eat these plants (or animals that eat them) we get that energy for our own use. Kinetic energy is energy of movement. When we eat plants with the stored chemical energy our bodies change it into kinetic muscle energy when we move, breathe, run, or move in any other way.

Although energy cannot be destroyed or created, it can be transferred from one object to another. Energy can also be changed from one form to another. When this happens, however, some energy is lost.

Learning about energy and its effects on our world is part of many science programs. In this unit, two strategies for differentiating instruction in the study of energy are modeled. The strategies are Tiering and Learning Centers. The tiering strategies support the lessons on forms of energy. The learning-center strategies support the lessons on energy-usage awareness. Materials are listed when appropriate.

The activities used with both strategies are self-directing and may follow a whole-class lesson. Students may work either independently or cooperatively to complete them. The lessons provided are samples. The complexity of each lesson can be decreased or increased. Some activities require more than one class period to complete. In your classroom, consider adding other types of differentiating strategies to create activities that meet the needs of your students during the unit on Using Energy.



Name _____ Date_____

With and without Energy

How we use energy can change the way we live. Today we have cell towers, utility poles, and nuclear power plants where there were once open areas or farms. We accomplish many more tasks using machines than we did in the past.

Think about what your home or classroom would look like without electricity. What would be missing? What other things would have to be there instead? Choose your school or home (or one room in it) and draw two versions of it. Make a drawing of that place as it would look if there were no electricity. Then draw it as it appears now with all the electrical lights, appliances, and other objects. Sketch your ideas below. Then transfer the drawings to larger paper.

My _____ without electricity.

My _____ now.

Forms of Energy

Energy is the ability to do work. There are two basic types of energy: kinetic and potential. Kinetic energy involves motion. Potential energy is stored energy. Energy cannot be seen or tasted. It cannot be created or destroyed. We usually do not think about it, but we all use energy in many forms every day. Your body needs energy to do the things you want to do. It also needs energy to maintain itself. When you feel tired, it is because you need more energy. We get our energy from the food we eat and from resting our bodies.

Energy comes in many forms. Research and list as many forms of energy as you can.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Choose five forms from your list and give an example of each.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date_____

Converting Energy

Energy in all its forms makes things happen only when it is changed from one form to another. For example, the energy you use comes from the food that you eat. You take in food that has chemical energy and your body converts (changes) it to physical energy (energy of motion). This allows you to move your body in so many different ways.

Think about the following examples of motors and machines and complete the chart by showing the types of energy that are changed by each. There may be more than one correct answer for some of these examples.

> **EXAMPLE:** A storage battery changes chemical energy into electrical energy. (Sometimes this electrical energy is then used for motion, light, heat, etc.)

1. A car engine changes _____ energy into _____ energy.

2. A toaster changes _____ energy into _____ energy.

3. A light bulb changes _____ energy into _____ energy.

4. A solar battery changes _____ energy into _____ energy.

5. An oil furnace changes _____ energy into _____ energy.

6. A television changes _____ energy into _____ energy.

Why We Should Save Energy

Most people use more energy than they realize. A great deal of this energy usage is likely unnecessary. Think of ways that your family and neighbors use energy. How much of this use is wasteful? Think of ways your family could reduce the heating and cooling bill. Perhaps there is a way for your family and those in your neighborhood to change driving habits and use less gasoline.

Research the energy habits of Americans. Write a persuasive essay to encourage others to change their energy-consumption habits. Narrow your focus and remember to use examples or details to support your position. Offer specific examples of wasting energy and how these bad habits can be changed.

Name _____ Date_____

Unit 3: Using Energy

Topic: Energy Usage

Energy from the Sun

Almost all energy on Earth comes from the sun. You have often noticed how hot a closed car gets when it sits in the sun. Perhaps you have walked on a sandy beach that had been so heated by the sun that you had to run or put on shoes to protect your feet. We can use this power of the sun to work for us. This simple experiment will prove how the power of the sun can be used instead of electricity to heat water.

Experiment:

Use two white and two black containers. Pour 4 ounces of water into each. Measure and record the temperature of the water in each container. Place one white and one black container in a location that will get sun all day. Place the other two containers in a shady place. After two hours check the temperature and record the readings of all four containers. Check the temperatures again before the end of the day.

Create a graph of your findings. Show the time of the temperature readings. Label which were the white and the black containers in the shade. Show these findings in blue. Identify the temperatures of the white and black containers in the sun and show these temperatures in red.

What conclusions can you make from this?

What connection does this have to solar panels? Where and how are they used?

_____

_____

_____

_____

_____

_____

_____

Materials:
Thermometer
Graph paper
Pencil
Red and blue pencils
2 Black containers
2 White containers
Water

Other Sources of Energy

We often hear and read about the price of oil and about how much gasoline is used by various types of vehicles. There are frequent news articles about energy costs and about the need to control our consumption of fossil fuels.

There are several alternatives to fossil fuels. Learn about these different types of energy sources and prepare a presentation to teach others about them. You may choose to design a bulletin board display, a chart, a banner, a PowerPoint presentation, or any other product that has been okayed. Plan your presentation in the space below.

Materials:
Reference materials
Markers
Oak tag
Construction paper
Magazine or newspaper photos
Original illustrations
Computer with PowerPoint software

Statement of the Problem

_____

_____

Suggestions for Improvement:

_____

_____

_____

_____

_____

Type and Details of Presentation:

_____

_____

_____

Habitats

Earth supports many diverse habitats. Each habitat has its own unique features and special animal and plant life. These plants and animals have made adaptations to the conditions of the habitat where they live. Biologists, botanists, zoologists, ecologists, and oceanographers have studied the varied habitats of Earth, and we have learned a great deal about each of them. We have learned that each habitat is fragile in its own way and must be understood, respected, and protected.

The study of habitats is incorporated into many elementary, upper elementary, and middle school science curricula. In this section of the book, two strategies for differentiating instruction in the study of habitats are modeled. The strategies are Multiple Intelligences and Learning Contracts. The multiple-intelligence strategies support the lessons on the oceans. They are labeled according to various learning styles. The learning-contract strategies support lessons on tropical rainforests. All students should do the activities in the first part of the contract. Students are then assigned to either Level A (basic) or Level B (more challenging) of the contract. General directions are explained on page 40. Page 41 shows the expected outcomes for all students. The activities that students must accomplish are described in the contract on page 42.

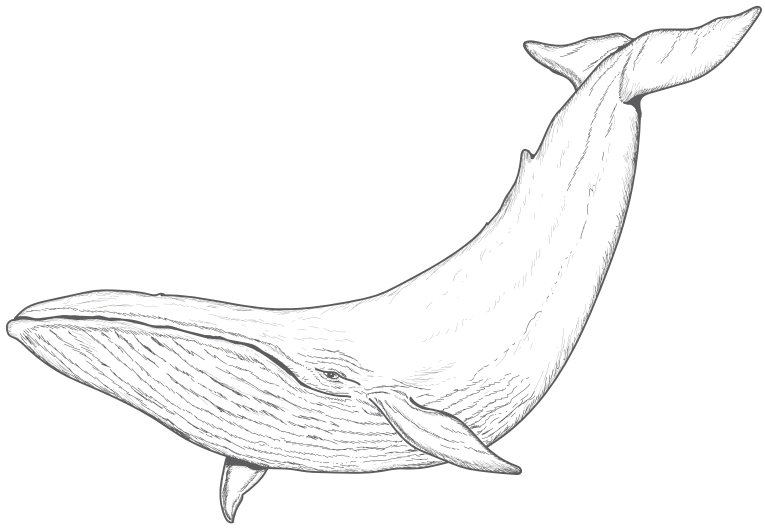
The activities used with both strategies are self-directing and may follow a whole-class lesson. Students may work either independently or cooperatively to complete them. The lessons provided are samples. The complexity of each lesson can be decreased or increased. Some activities require more than one class period to complete. In your classroom, consider adding other types of differentiating strategies to create activities that meet the needs of your students during the unit on Habitats.

Image Sources: iStock/LeeJianbing

The Song of the Humpback Whale

The deep blue Pacific Ocean is the habitat of humpback whales. Humpback whales have created songs to communicate with each other. Oceanographers and marine biologists have discovered that each pod, or family group, has its own song. The songs can last as long as twenty minutes and can be heard from far away. The patterns of the songs can change. No one is quite sure of the meanings of the songs. Scientists think that the humpback whales use these "songs" for various purposes.

Learn about the other plants and animals of the habitat where humpback whales live. Write your own song about this habitat. Include the prey of the humpback, any enemies it may have, and the conditions of the habitat.



Endangered Sea Life

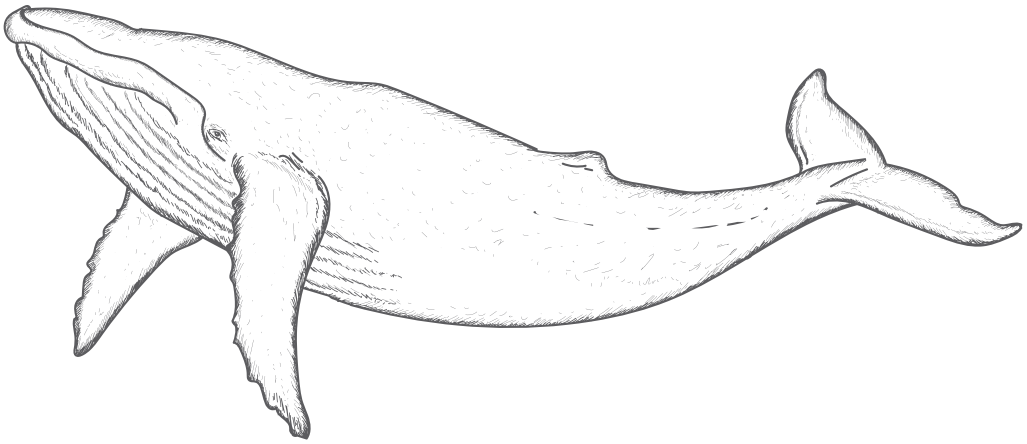
There are many plants and animals living in different habitats of the world's oceans and seas. Some of these plants and animals are threatened with extinction. The threats come in different forms. In some cases, it is human encroachment on breeding grounds and tidal pools. In other cases, the threat is from overfishing, pollution, or ocean dumping. Examples of things especially harmful to many species of ocean life are the discarded plastic rings that hold together six-packs of soda cans and other beverages. Also harmful are discarded helium balloons.

Choose an ocean habitat that has been affected negatively by humans. Research that habitat and write a letter to a government official expressing your views about what needs to be done. Remember to use a business-letter format. Be sure of your facts and have someone check your spelling and grammar.

The Great Blue Whale

As far as we know, the great blue whale is the largest animal that has ever existed on Earth. These are truly amazing animals. Research and learn about the great blue whales and their habitat.

Create a two-part visual product that demonstrates the relative size of a great blue whale. One part should compare these marine mammals with other animals and things in its habitat. The second part should compare the great blue whale with things in your habitat, such as a school bus, an airplane, a cafeteria table, or a football field. Some product ideas are a poster, a tabletop display, a PowerPoint presentation, a tri-fold stand up, and a bulletin-board display.



The Contract: How Does It Work?

As part of our unit on Habitats you will complete some independent activities in class. This will help you understand the things we will be reading about and doing later.

Steps in Completing a Learning Contract

1. Five class periods have been scheduled to complete the sections of the contract. You can do some of it as homework if you like. You may work on the activities if you have extra time in class. The references and other materials that I have gathered must be kept in the classroom.
2. There is no order to the activities. You may complete them in any order as long as you focus on the work and are making progress. Keep all work in the folder provided. Let me know when you have completed each activity. As each piece of the contract is checked, I will initial the checklist on your folder. You might want to have a classmate check your work before handing it in. You may ask for help whenever you are having difficulty. I will be available to help you if I am not already helping someone else.

You may work anywhere in the classroom as long as you are being productive.

Do your best work. Your contributions will help us all in the study of habitats.

Habitats Learning Contract

Outcomes and Expectations

You should expect to know, understand, and be able to do the following as a result of your work:

Know . . .

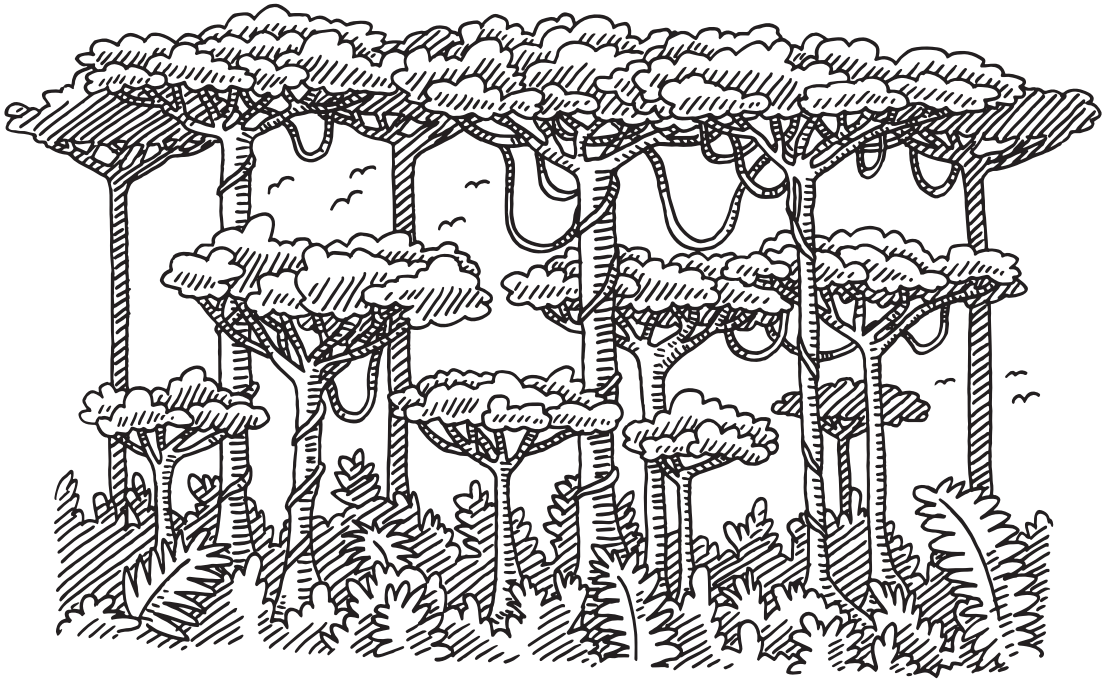
1. the different levels of a tropical rainforest.
2. where in the world tropical rainforests are located.
3. several species of plants and animals of the tropical rainforests.

Understand . . .

1. how and why tropical rainforests are being destroyed.
2. that we get valuable medicines from a few of the plants of the tropical rainforests and that there may be many others that we have not yet discovered.
3. that we use many products that come to us from tropical rainforests.

Be able to . . .

1. help others to understand why it is important to save the tropical rainforests.
2. explain the threats to the world's tropical rainforests.
3. name some of the products that we use that come from the tropical rainforests.



Habitats

The Learning Contract

Tropical rainforests once covered the earth like a wide, green belt at the equator. Only one percent of all plants in the tropical rainforests have been studied, but 25 percent of our medicines come from 1 percent of those plants. However, Earth's rainforests are disappearing rapidly. Unless worldwide measures are taken to stop the destruction, these rainforests will someday disappear!

All students will complete the following activities. Then some will be assigned Contract A and some will be assigned Contract B.

- Describe the main levels of a tropical rainforest. Make a diagram or model showing plants and animals that live on each level. Choose one plant or animal and explain how it has adapted to its particular place in the rainforest habitat.
- Find out about one medicine that is derived from a plant of the tropical rainforest.
- Create a riddle about a plant or animal in the tropical rainforest for classmates to identify. In your riddle, give three clues, each revealing more information about the answer.
- Write an explanation about why tropical rainforests are referred to as "vanishing treasures."

Contract A

- Choose one of the tropical rainforests of the world. Describe the physical details. Include information such as location, size, temperatures, rainfall amounts, and landforms.
- Write a first-person narrative from the point of view of a rainforest inhabitant. Tell about your life in the rainforest.
- Collect wrappers, ads, and packages of products that originate in the rainforest. Some possibilities include Brazil nuts, orchids, cocoa, and vanilla. Arrange the items in an attractive display to teach others about the importance of the world's tropical rainforests.

Contract B

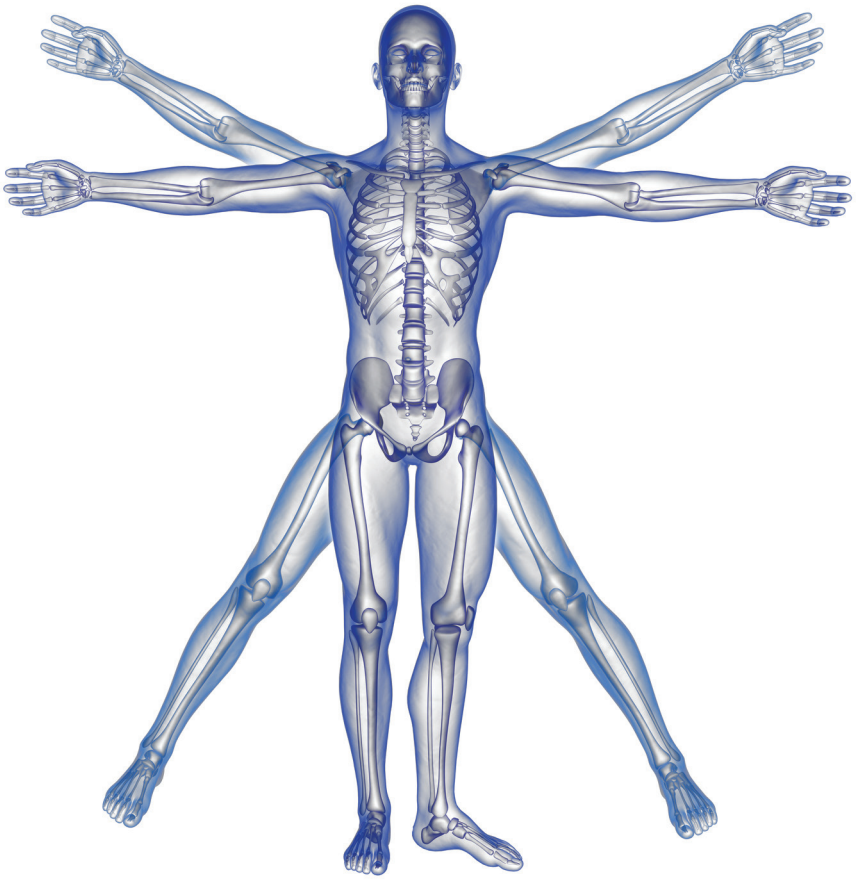
- Make a poster that shows a food web of the animals of a tropical rainforest. Label each part of the web.
- Pick a state of the United States. How many species of mammals live there? Compare this to the number of species that live in the rainforests of Brazil, Costa Rica, and Malaysia. Show the results of your study in a chart to share with the class.
- In your opinion, what is the most interesting plant or animal of the rainforest? Describe it and tell how it has adapted to its habitat. Explain why you think it is interesting. Include a photo or drawing of your subject.

The Amazing Human Body

At all grade levels, students are fascinated about the inner workings of the human body and are curious to understand how the various parts and systems function. It is not surprising, therefore, that the study of the human body is included in the life-science section of every state curriculum.

In this unit, two strategies for differentiating instruction in the study of the Amazing Human Body are modeled. The strategies are Multiple Intelligences and Learning Centers. The multiple-intelligence strategies support the lessons on the five senses. They are labeled according to various learning styles. The learning-center activities support the lessons on systems of the human body. They are labeled according to interest. Materials are listed when appropriate.

The activities used with both strategies are self-directing and may follow a whole-class lesson. Students may work either independently or cooperatively to complete them. The lessons provided are samples. The complexity of each lesson can be decreased or increased. Some activities require more than one class period to complete. In your classroom, consider adding other types of differentiating strategies to create activities that meet the needs of your students during the unit on the Amazing Human Body.



Name _____ Date_____

Unit 5: The Amazing Human Body

Topic: The Five Senses

Mystery Bags

We depend on the sense of touch to keep us out of danger and to prevent serious injuries. The nerves under our skin alert us to pain, pressure, and changes in temperature. How much do you know about the sense of touch?

This activity challenges you to recognize objects by touch alone. To prepare for the activity, work with a partner to gather objects of different sizes, shapes, and textures. You may obtain them from home and school. Some examples are an apple, pebbles, sandpaper, a plastic ruler, silk, sticky tape, wood, or chalk. Place the objects in a paper "mystery bag."

On a selected school day, you and your partner will exchange mystery bags with classmates. Wearing a blindfold, you will reach into the bag and try to identify the object you have pulled out using the sense of touch alone. Keep a record of the objects that were easy to identify and the objects that were more difficult to recognize.

What did you learn about the sense of touch from this activity?

Mystery Object List
Work with your partner to create a list of objects to place in your mystery bag. Try to vary your selection.
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

News Sense

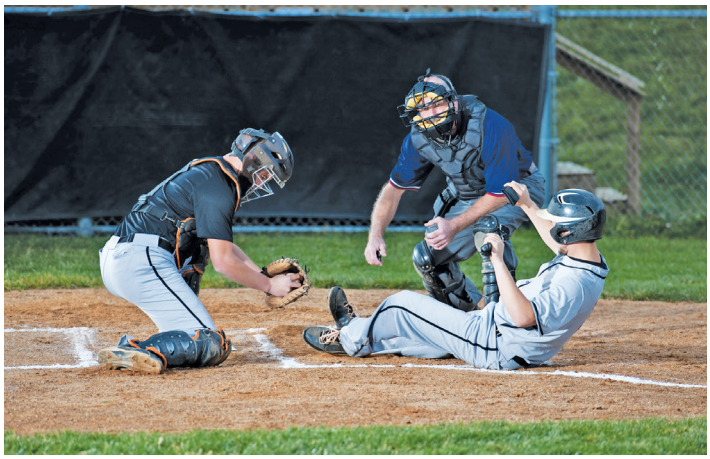
Your five senses help you to see, hear, smell, taste, and touch. Although all are important, sight is the sense that brings us the most information. Of course, all the senses make us more aware of our surroundings.

When you read a news article, think of the sights, sounds, smells, tastes, and textures you would experience if you were there to observe the event. Here's one for you to try.

Look carefully at the photo and caption below, and think of sensory words or phrases that would describe the scene in the ballpark. What might you see, hear, taste, smell, or touch if you were a fan or a player? Write your ideas next to each sense.

Sight

Taste



Hear

Touch

Lincoln High's catcher, John Hill, attempts to tag out Central's Bob Smith as he approaches home plate. Umpire Mike Burns prepares to make the call.

Smell

Look in the newspaper for a news article that appeals to your senses. Examine it and record your sensory ideas in a writing journal.

Image Sources: iStock/bmcent1

Name _____ Date_____

Unit 5: The Amazing Human Body

Topic: The Five Senses

Invent a Musical Instrument

The world is filled with many sounds. Close your eyes for a minute and write down the sounds you hear in your classroom. Your sense of hearing offers you many pleasures, such as conversing with a friend, listening to a favorite song, or discovering the sounds in nature. It also alerts you to dangers with the sound of an alarm bell or a shrieking siren.

We all enjoy listening to the varied sounds of standard musical instruments and can identify the distinct sounds of many of them. It's easy to recognize the sounds of a piano or a drum, but the difference between an oboe and a clarinet may be a little harder to distinguish.

In this activity, you are asked to invent a musical instrument that makes music by being plucked, shaken, struck, blown, or played with a bow. Gather materials that you can use in this project.

Possible Materials:
Jugs, plastic bottles
Combs with waxed paper;
Coffee or juice cans; Oatmeal boxes;
Paper towel tubes, straws
Bells, stones;
Glasses, jars
Shoe boxes; String; Tape

Name your instrument and create a tune that you can play on it for the class. Sketch your musical instrument.

Exercise Your Brain

The brain is the main organ in the nervous system. It controls all our body functions and helps us to speak, remember, understand, and imagine. The largest part of the brain is the cerebrum. It has two halves, or hemispheres. In general, the left half controls our logical thinking while the right half is responsible for creativity. The cerebrum is also where our memories are stored. The part of the brain called the cerebellum takes care of balance and body movements. The brain stem connects to the spinal column and controls involuntary breathing, heart rate, blood pressure, and other important processes.

Work with a partner or independently to solve the following brain teasers:

1. Supply the missing number to complete the following pattern:

   2, 6, 5, 9, 8, _____

2. Which instrument does not belong? Why?

   Clarinet Flute Oboe Trombone

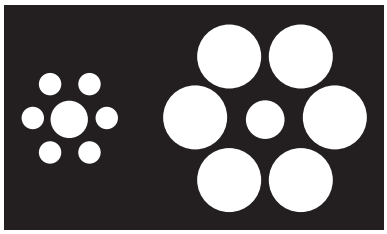
   _____

3. Which of the middle circles looks bigger?

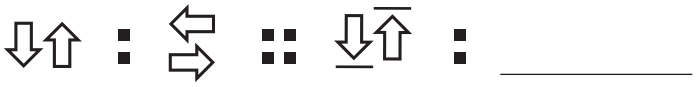
   _____

   _____

   _____



4. Solve the figural-analogy puzzle. Look at how the first two items are related and decide what comes next.



5. Find the name of the animal that is hidden in the sentence. Underline it.

   Please allow more travel time in bad weather.

6. Which state does not belong? Why?

   Pennsylvania Virginia Massachusetts Tennessee

Create three of your own brain teasers to share with your group.

Exercise Your Brain: Answers

The brain is the main organ in the nervous system. It controls all our body functions and helps us to speak, remember, understand, and imagine. The largest part of the brain is the cerebrum. It has two halves, or hemispheres. In general, the left half controls our logical thinking while the right half is responsible for creativity. The cerebrum is also where our memories are stored. The part of the brain called the cerebellum takes care of balance and body movements. The brain stem connects to the spinal column and controls involuntary breathing, heart rate, blood pressure, and other important processes.

Work with a partner or independently to solve the following brain teasers:

1. Supply the missing number to complete the following pattern:

   2, 6, 5, 9, 8, 12 (The pattern is +4, -1.)

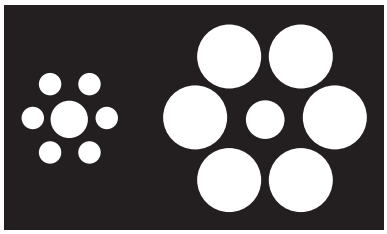
2. Which instrument does not belong? Why?

   Clarinet Flute Oboe Trombone

   The trombone doesn't belong because it is not a woodwind instrument

3. Which of the middle circles look bigger?

   Although the one on the left appears bigger, they are both the same size.



4. Solve the figural-analogy puzzle. Look at how the first two items are related and decide what comes next.

5. Find the name of the animal that is hidden in the sentence. Underline it.

   Please allow more travel time in bad weather.

6. Which state does not belong? Why?

   Pennsylvania Virginia Massachusetts Tennessee

   Tennessee doesn't belong because it isn't one of the 13 original states.

Be a Medical Illustrator

In this activity, you will take on the role of a medical illustrator and draw a picture of the heart. The job of a medical illustrator is to provide doctors with detailed drawings of the inner workings of the human body. Medical illustrators must be proficient in both art and science. Their accurate drawings help medical students learn important concepts about the human body.

One of the most important organs of the human body is the heart. The heart is the main organ of the cardiovascular system. The word part *cardio-* means "heart" and the term *vascular* means "related to vessels." The blood vessels, which include arteries, veins, and capillaries, transport the blood pumped by the heart throughout the body.

To help you get started on your project, first look for information about the heart in a textbook or on the internet. What does the right side of the heart do? What does the left side of the heart do? Locate a picture of the heart and notice the upper and lower chambers on each side. What are the names of the chambers? In your medical illustration, show and label as many details as possible. Use a variety of colors to make different parts of the heart stand out. Use arrows to indicate how blood flows through the heart.

Materials:
Colored pencils, crayons, or markers paper supplies
Resource materials

Sketch the first draft of your drawing here. Draw your final illustration on other paper.

Name _____ Date_____

Unit 5: The Amazing Human Body

Topic: Human Body Systems

Using Our Lungs

The function of the respiratory system is to supply oxygen to our blood so that the oxygen gets to all the parts of our body. The main organs of the respiratory system are our two lungs. Our lungs work hard to keep the process of respiration working smoothly. Other parts of this system include mouth, nose, trachea, and diaphragm. These organs allow us to breathe. When we breathe, we inhale (or take in) oxygen and exhale (or give off) carbon dioxide.

Experiment: Each group member should fill in the chart.

Use a stopwatch to count the number of times you inhale in sixty seconds while you are seated. Record the total on the chart in the At Rest column. Next, stand and jump in place fifteen times. Keep standing and walking in place as you again count the number of times you inhale. Record your total in the After Exercise column. Are the totals different? Explain in writing.

Record of Inhalation in Sixty Seconds		
NAME	AT REST	AFTER EXERCISE

Because our lungs are so important to our health, we must do everything to take good care of them. Exercise that increases lung capacity, such as swimming, biking, or running, should be part of a weekly routine. When people smoke, they are endangering their lungs. Tobacco smoke can cause cancer and emphysema as well as heart disease.

Write a Letter:

Write a persuasive letter to convince a smoker to stop smoking because of the danger to his or her lungs. Use resource materials and include facts to support your argument.

Materials:
Stop watch
Paper supplies
Resource materials, internet
Chart (enlarged and with appropriate number of lines)
Pencils or pens
Pictures of healthy and damaged lungs

Section III

Differentiation Templates

Types of Learners
Organizing Template

Before you begin to create differentiated lessons for your students, take some time to think about their learning differences. What types of learners do you have in your class? Some suggested categories are listed below. You may add others. Remember that some students may fit into more than one group. Write the student names under each heading.

Likes to work in group settings:
Likes to work alone:
Requires special help in _____:
Requires special help in _____:
Needs to be challenged more in _____:
Needs to be challenged more in _____:
Works slowly:

Works quickly:
Thinks creatively:
Thinks analytically:
Is well-organized:
Lacks skills in organization:
Follows routines easily:
Has difficulty following routines:
Other: (Explain.)

Multiple Intelligences

Lesson Design (MI)
Content Area:
Title of Lesson:
Objectives/Goals:
Materials Needed:
Types of Assessment Used (MI)

Instructional Activities (MI)		
TYPE OF INTELLIGENCE	ACTIVITY	STUDENT NAMES
Verbal/Linguistic		
Logical/Mathematics		
Visual/Spatial		
Bodily/Kinesthetic		
Musical		
Interpersonal		
Intrapersonal		

Creating a Learning Contract

Content Area: _____ Topic: _____
Goals and Objectives:
General Activities for All Students:
Contract A Activities:
Contract B Activities:
Time Limit for the Contract: _____
Resources and Materials
Learner Needs in My Class Related to This Topic

Independent Investigation Agreement

I, _____, agree to the following terms as discussed with _____ on _____.

Nonnegotiable Items

Negotiable Items

I know I will be evaluated in these ways:

I will do my best on this work and will have it completed on time.

_____ (Student Signature)

I will provide guidance to the student throughout the term of this contract.

_____ (Teacher Signature)

I will support and encourage my student while completing this contract.

_____ (Parent / Guardian Signature)

Self-Evaluation Form

Differentiated Lesson
Subject:_____ **Lesson Title:**_____ **Type(s) of Differentiation Used:**_____
Lesson Description
In what ways was the lesson successful?
In what ways could the lesson be improved?

Name _____ Date_____

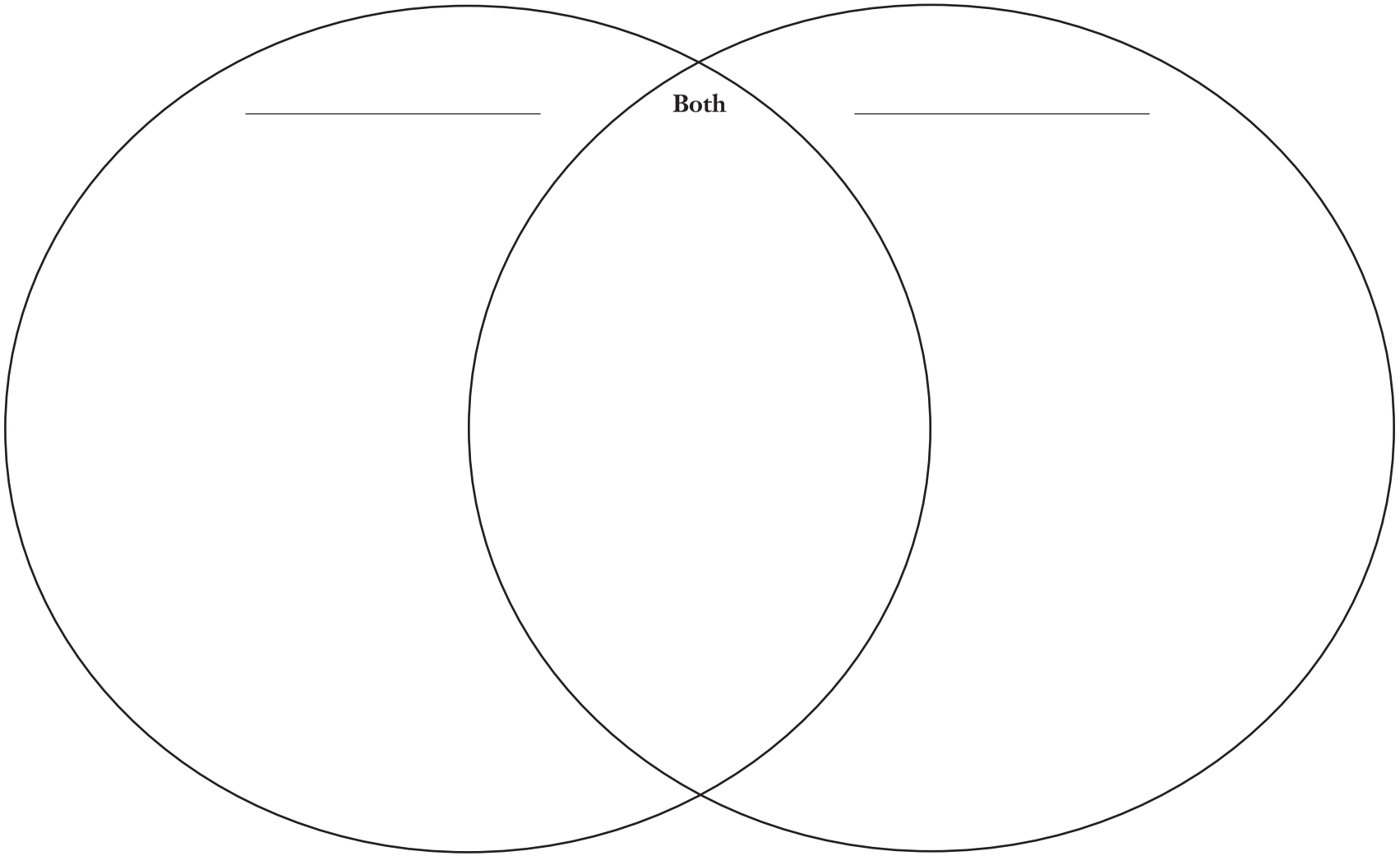
Compare and Contrast Chart

Graphic Organizer	
Topic 1:_____	
Topic 2:_____	
HOW ARE THE TOPICS ALIKE?	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
HOW ARE THE TOPICS DIFFERENT?	
Topic 1	**Topic 2**
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Compare and Contrast Venn Diagram

Name _____ Date _____

Topics:_____and _____



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Davies, Nicola. *Oceans and Seas.* Boston, MA: Kingfisher Books, 2007.

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National Geographic Kids, Habitats: kids.nationalgeographic.com/explore/nature /habitats/Kids.sandiegozoo.org

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Publisher's note: At the time of publication, websites were reliable and suitable for children. However, website content may change frequently. No guarantee is made about the content listed above; children should always be closely supervised when using the Internet.