

The Industrial Revolution

Fun Projects for U.S. History

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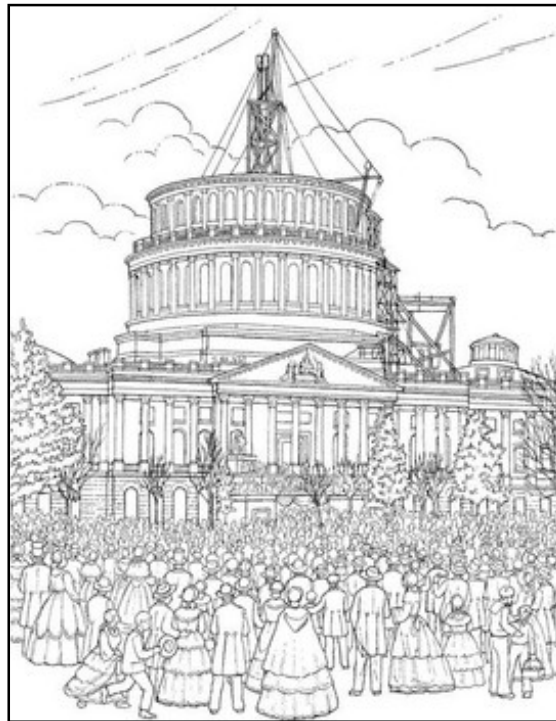
The Industrial Revolution

Welcome to an extensive collection of hands-on activities focusing on the people, places, and events of the Industrial Revolution. Included is a CD-ROM featuring full-color presentations of each activity.

THE INDUSTRIAL REVOLUTION

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THE INDUSTRIAL REVOLUTION

GENERAL OVERVIEW

This collection of enrichment activities was designed to complement existing curricula and expand one's understanding of what it was like to live during the past. Studies have confirmed that using one's hands helps students retain information. If you are looking for creative and simple—yet stimulating and exciting—projects to spark learning, take the next step toward a highly engaging encounter.

Regardless of a student's age, learning by doing will help maintain their interest, improve retention of information, and foster a desire to learn now and in the future.

As an educator with 18-plus years of teaching and product development experience, it is my personal goal to encourage young people to be creative. Each of the activities included in this collection is based on actual artifacts and is representative of the era. A conscious effort was made to develop projects constructed from readily available materials that result in a stunning end product.

It is my heartfelt desire that both teacher and student will find the activities in this book a wonderful journey of creativity.

Jean Henrich

THE INDUSTRIAL REVOLUTION



Steamer Trunk and Passage Documents



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Make a Steamer Trunk and Passage Documents

Steamer trunks were a type of luggage used for carrying a large number of personal items on long trips. They were made from a variety of hard wood (including cedar and oak) and were often covered with leather made from the hides of cows, horses, or deer. Decorative details such as nails, tacks, and ornate locks added to their appeal. Trunks were used not only by immigrants, but by traveling salesmen, circus performers, and regular travelers.

MATERIALS NEEDED

- Plaid FolkArt® acrylic paints (black, gold metallic, antique white, and burnt umber)
- Paintbrush
- Paper towels
- 4" x 6" wooden or papier-mache "trunk" (we found ours at a local craft store)
- Wallpaper (ask your local home building store for discontinued wallpaper books)
- Scissors
- Brown kraft paper of paper bags
- Decoupage medium
- **X-Acto® knife (ADULT SUPERVISION REQUIRED)**
- **Hot glue gun and glue (ADULT SUPERVISION REQUIRED)**
- **Candle (ADULT SUPERVISION REQUIRED)**
- **Brown spray paint (ADULT SUPERVISION REQUIRED)**
- **Mini-iron (optional—ADULT SUPERVISION REQUIRED)**
- Beeswax
- Shoe polish (black or brown)
- Tacky glue
- 4" x 6" index cards
- Scrap paper, crayons, etc. (for collage)
- Instant coffee or tea leaves
- Water
- Cooking oil



THE INDUSTRIAL REVOLUTION

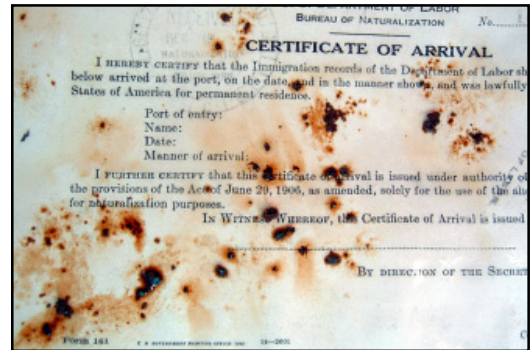
1. ANTIQUE AND FILL OUT THE DOCUMENTS

There are a couple of different and effective techniques to antique stationery, envelopes, and documents. You can use one or more of the following ideas to antique the documents on pages 9–11:

- Dampen the documents with water and sprinkle instant coffee over the surface.



- Place the documents into a container filled with water and sprinkled with tea leaves. Let the paper remain in the water until it achieves an aged appearance.



- Tear the edges and rub them with some burnt-umber and yellow-ochre paint.

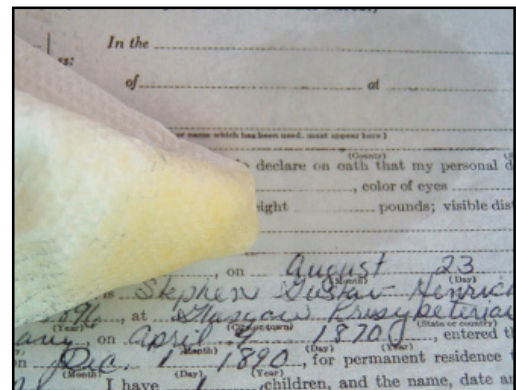


- **WITH ADULT SUPERVISION,** carefully burn portions of the paper. Do not overdo this step.



- Rub the surface of the documents with a paper towel coated with cooking oil.

HELPFUL HINT: Use this technique only after you have applied the other techniques (including adding graphics) since the oil might cause the ink to smear.



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2. LINE THE TRUNK

- Line the interior of the trunk with marbled or vintage-looking wallpaper. Use tacky glue to hold it in place.



3. MAKE AND APPLY THE FAUX LEATHER

HELPFUL HINT:

This step can be messy.
Wear plastic gloves and
an apron to protect
your clothes.

- Tear up some pieces of brown paper bag or kraft paper. Dampen the paper with water and crumple it.



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3. MAKE AND APPLY THE FAUX LEATHER (continued)

- With a paintbrush, apply alternating layers of decoupage medium and brown paper to the outside of the trunk.

- Continue layering the crumpled paper on all sides of the trunk. You want the paper to be highly textured to simulate real leather. Let dry before proceeding to the next steps.



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3. MAKE AND APPLY THE FAUX LEATHER (continued)

- Cut the handles off of a large brown paper bag and glue these around the outside of the trunk to represent thick leather strapping.
- **WITH ADULT SUPERVISION**, push decorative tacks into the front and top of the trunk where desired.

- Apply brown or black shoe polish to the surface of the trunk. Wipe away the excess, but don't remove it all, since it helps to highlight some of the texture.



- As an optional step for adding texture, drip some beeswax onto the surface of the trunk. **WITH ADULT SUPERVISION**, use the iron to help smooth out the wax.

- Continue to rub—buff the surface of the trunk. This will bring out the shine from the shoe polish (and beeswax).

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4. MAKE AND APPLY THE FAUX LEATHER (continued)

- After applying the shoe polish to the surface of the trunk, you will end up with a highly textured and realistic-looking faux leather steamer trunk.



5. DISPLAY

- Place the previously made immigration documents inside the trunk (either closed or open), as illustrated below.



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DECLARATION OF INTENTION

TRIPLICATE
(To be given to
declarant)

No. _____

UNITED STATES OF AMERICA

DECLARATION OF INTENTION

(Invalid for all purposes seven years after the date hereof)

_____ } In the _____ Court
SS: _____
_____ of _____ at _____

I, _____
(Full true name, without abbreviation, and any other name which has been used, must appear here)
now residing at _____
(Number and street) (City or town) (County) (State)
occupation _____, aged _____ years, do declare on oath that my personal description is:
Sex _____, color _____, complexion _____, color of eyes _____
color of hair _____, height _____ feet _____ inches; weight _____ pounds; visible distinctive marks _____
race _____; nationality _____
I was born in _____, on _____
(City or town) (Country) (Month) (Day) (Year)
I am _____ married. The name of my wife or husband is _____
(Month) (Day) (Year)
we were married on _____, at _____; she or he was
(Month) (Day) (Year) (City or town) (State or country)
born at _____, entered the United States
(City or town) (State or country) (Day) (Year)
at _____, on _____, for permanent residence therein, and now
(City or town) (State) (Month) (Day) (Year)
resides at _____ I have _____ children, and the name, date and place of birth,
(City or town) (State or country) (Month) (Day) (Year)
and place of residence of each of said children are as follows: _____

I have _____ heretofore made a declaration of intention: Number _____, on _____
(City or town) (State) (Date)
at _____
(City or town) (State) (Name of court)
my last foreign residence was _____
(City or town) (Country)
I emigrated to the United States of America from _____
(City or town) (Country)
my lawful entry for permanent residence in the United States was at _____
(City or town) (Country)
under the name of _____, on _____
(City or town) (State) (Month) (Day) (Year)
on the vessel _____
(If other than by vessel, state manner of arrival)

I will, before being admitted to citizenship, renounce forever all allegiance and fidelity to any foreign prince, potentate, state, or sovereignty, and particularly, by name, to the prince, potentate, state, or sovereignty of which I may be at the time of admission a citizen or subject; I am not an anarchist; I am not a polygamist nor a believer in the practice of polygamy; and it is my intention in good faith to become a citizen of the United States of America and to reside permanently therein; and I certify that the photograph affixed to the duplicate and triplicate hereof is a likeness of me: So HELP ME GOD.



(Original signature of declarant without abbreviation, also alias, if used)
Subscribed and sworn to before me in the office of the Clerk of said Court,
at _____ this _____ day of _____
anno Domini 19____ Certification No. _____
I, _____, Clerk of the Court, do hereby certify that the above is a true and correct copy of the original declaration of intention of the declarant for permanent residence on the date stated above, has been received by me. The photograph affixed to the duplicate and triplicate hereof is a likeness of the declarant.

[SEAL] _____ Clerk of the _____ Court.
By _____, Deputy Clerk.

Form 2202-L-A
U. S. DEPARTMENT OF LABOR
IMMIGRATION AND NATURALIZATION SERVICE

14-2023
U. S. GOVERNMENT PRINTING OFFICE: 1912

THE INDUSTRIAL REVOLUTION

U. S. DEPARTMENT OF LABOR
BUREAU OF NATURALIZATION

No. 14 5063

CERTIFICATE OF ARRIVAL

I HEREBY CERTIFY that the Immigration records of the Department of Labor show that the alien named below arrived at the port, on the date, and in the manner shown, and was lawfully admitted to the United States of America for permanent residence.

Port of entry:
Name:
Date:
Manner of arrival:

I FURTHER CERTIFY that this certificate of arrival is issued under authority of, and in conformity with, the provisions of the Act of June 29, 1906, as amended, solely for the use of the alien herein named and only for naturalization purposes.

IN WITNESS WHEREOF, this Certificate of Arrival is issued

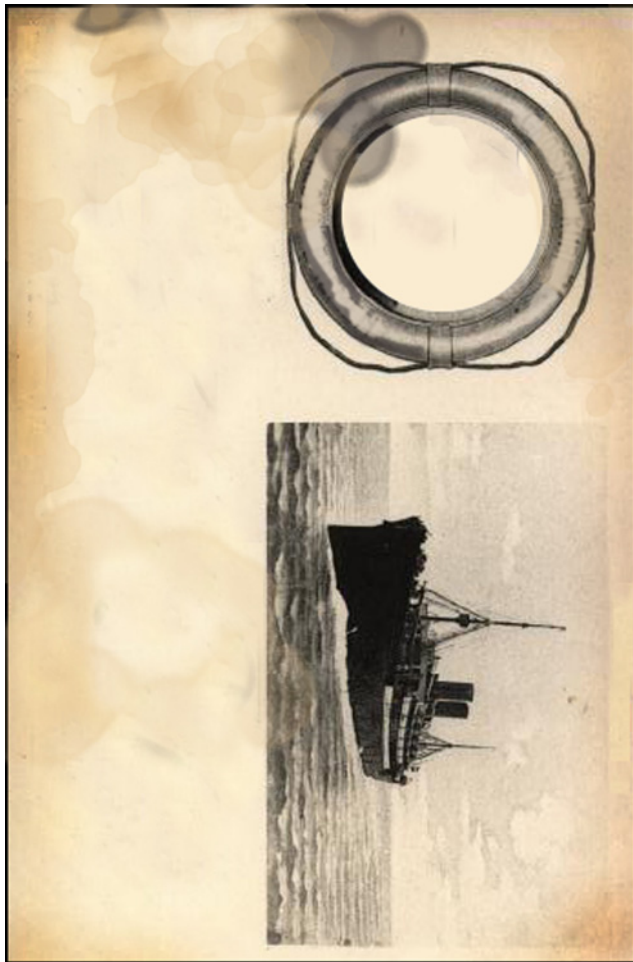
BY DIRECTION OF THE SECRETARY OF LABOR.

Form 161 U. S. GOVERNMENT PRINTING OFFICE: 1902 14-2601 Commissioner of Naturalization.



Postcard—Add your own words to the blank space
and a picture of your choice inside the lifesaver

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WSTSA FORM

ASSIGNMENT CARD AND MEAL TICKET

MY BOAT DRILL STATION IS	MY COMPARTMENT IS
COMMANDER'S SIGNATURE	UNIT

NO MEALS SERVED WITHOUT THIS CARD. KEEP IT WITH YOU
DO NOT THROW ANYTHING ON DECK OR MESS TABLES

O.D.P. 50 50M-S-46

AMERICAN STEAMER LINES

IMPORTANT

In order to expedite your landing upon arrival at

immediately after quarantine inspection, please present this notice personally to the Immigration Inspector in the Social Hall, Smoking Room.

Every passenger on board must appear before this official, and this will serve as an identification.

Name _____

Number on General Manifest _____

List Number _____ Number on List _____

Number of Manifest Form I 415 _____

Line on Manifest Form I 415 _____

IN BOND CABIN NO. _____

AMERICAN STEAMER LINES

QUARANTINE CARD

FOR

THIRD CLASS

Name _____ List Number _____

This Card must be handed to the boarding Doctor PERSONALLY

TRIPPLICATE NOT GOOD FOR PASSAGE

AMERICAN STEAMER LINES

FORM 42 No. 600826

NON-TRANSFERABLE THIRD CLASS TICKET

PASSENGER'S IDENTIFICATION COPY

From _____ To _____		ON S.S. _____ VOY. _____	
		DATE _____	
NAMES OF PASSENGERS	AGE	ADULTS	HALF
		QUARTER	INFANT
		PER CAPITA FARE	
		COMPARTMENT	
		BIRTH	
		ISSUING AGENT'S INITIALS	
		TOTAL	

EXCHANGED FOR _____

ISSUING AGENT'S STAMP

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Fantastic Flying Machine



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Design and Make a Fantastic Flying Machine

From earliest times, the concept of flight has captured the human imagination. This activity is designed to give you several ideas and techniques for creating your own fantastic flying machine. The only rule is to let imagination guide your design.

MATERIALS NEEDED

- Drawing paper
- Artist materials (colored pencils, crayons, watercolors, magic markers, dimensional paint, metallic paint, etc.)
- Collage materials (tissue paper, small charms, fabric, tassels, wire, etc.)
- Florist foam
- Dowel
- Plaid FolkArt® acrylic paint
- Paintbrush
- Celluclay® instant pulp papier-mache
- Scissors



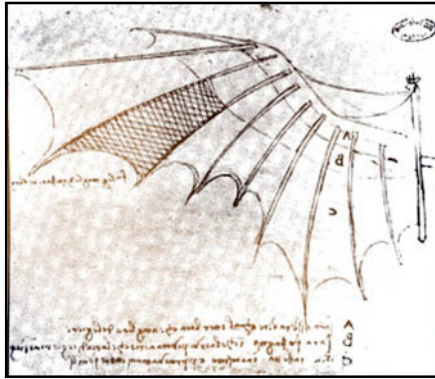
The following Web site offers several designs as inspiration:

<http://art-of-flying.com/gallery.htm>



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1. GETTING INSPIRED



- Selecting a theme for your fantastic flying machine will make designing the aircraft easier and help you decide which construction materials to use. For example, your aircraft might be designed for exploration, traveling through time, or entertainment.
- Think about adding elements from nature or of an activity that makes you happy to your design. Layer different features to make your flying

machine fun and interesting.

- Use books, magazines, or movies to research flying machines.

2. DESIGNING YOUR FLYING MACHINE

- On page 16 is a listing of possible bases, flight components, construction materials, and embellishments. Use these ideas to help you create a rough sketch.

• **The base:** All flying machines require some sort of base, such as a woven basket, hull of a ship, or shape of an animal. Our example uses the shape of an exotic bird.

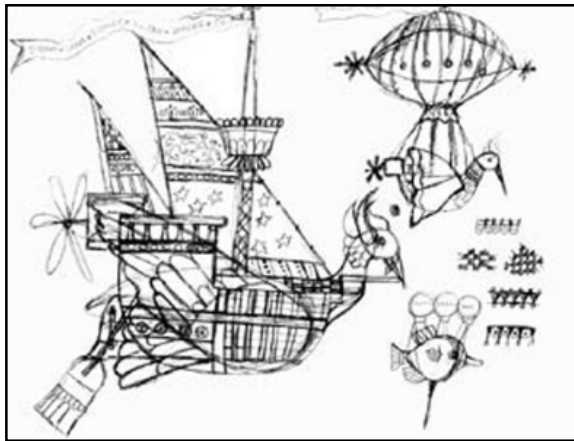
• **Flight components:** All flying machines require something to help them take to the air, such as wings, sails, a balloon, or propellers. For our design, we chose Egyptian-style sails and a football-shaped balloon for the primary components and three pinwheels for the secondary components.



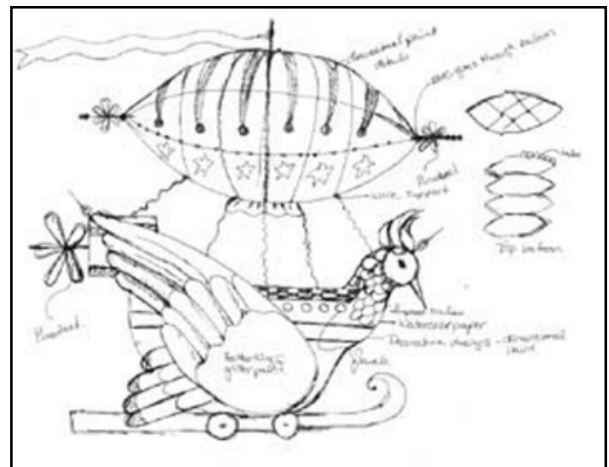
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2. DESIGNING YOUR FLYING MACHINE (continued)

- Don't worry about the quality of your sketches—you just want to come up with some ideas. As you formulate your design, select the elements you want to develop further. Below are two stages of drawings for our fantastic flying machine.
- In the first drawing, we experimented with a bird-shaped base and a sail and mast, then drew a smaller design incorporating a football-shaped balloon. We considered using butterfly and dove wings and tried some sample pattern designs.



- For our final design, we selected elements of birds and added wheels for landing. We also developed a preliminary design for construction of the football-shaped balloon and added embellishments and ideas for materials.



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FANTASTIC FLYING MACHINE IDEA LIST

BASES

Animals

Pig
Horse
Eagle
Swan
Fish
Butterfly
Bumblebee
Dinosaur

Ships

Galleon
Egyptian
Greek
Raft

Other

Submarine
Automobile
Train
Sled
Flying saucer
Magic carpet
Shoe

FLIGHT COMPONENTS

Wings

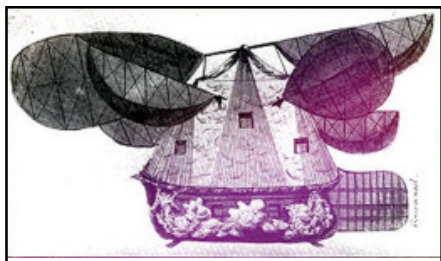
Bat
Eagle
Peacock
Dove
Butterfly
Dragonfly
Moth
Bumblebee
Fairies
Dragons

Other

Balloon
Windmill sails
Rocket engine
Solar panel
Bicycle parts
Fish tail
Ship sail
Kite
Rudder
Oars
Umbrella
Clouds
Bi-wings
Tri-wings
Parachute
Propeller

EMBELLISHMENTS

Tassels, lace, fringe
Strings of beads or pearls
Jewels, charms, chains
Buoys
Mast and crow's nest
Ropes, flags, banners
Feathers
Ribbons
Buttons
Glitter
Gauze
Mesh
Wire
Fishing supplies
Coins
Dollhouse items
Magnifying glass
Clock pieces
Nuts, bolts, screws
Small wooden cutouts
Seashells
Candy
Silk flowers
Keys
Artificial fruit
Moon, sun, stars
Crystals
Musical instruments
Bobbins
Compass



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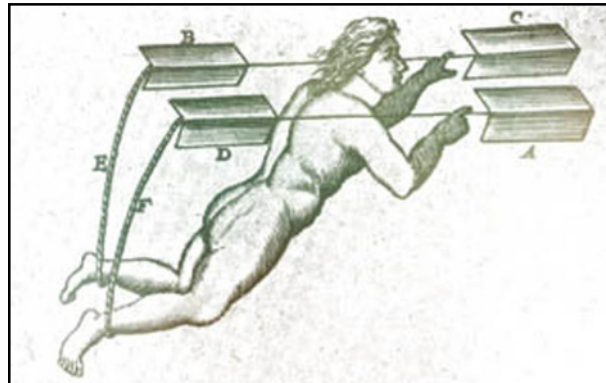
CONSTRUCTION MATERIALS

Aluminum cans
Papier-mache
Empty milk containers
Small boxes
Old models of ships or airplanes
Balsa wood
Plastic balls
Clay
Aluminum foil
Tissue paper
Felt
Cardboard
Jewelry wire
Embossed paper
Watercolor paper



DECORATIVE MATERIALS

Paint (acrylic, metallic, dimensional)
Magic markers
Chalk
Pastels
Colored pencils
Crackle medium
Texture medium
Rubber stamps
Stickers

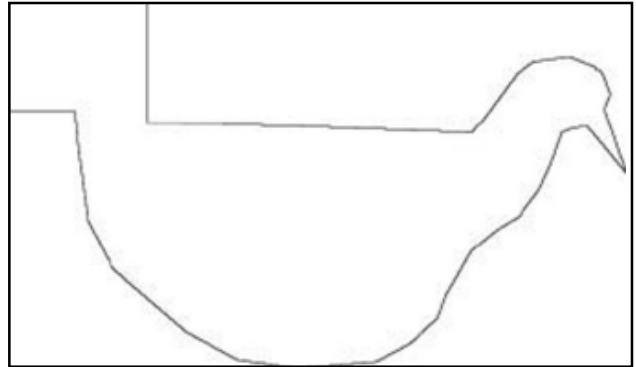


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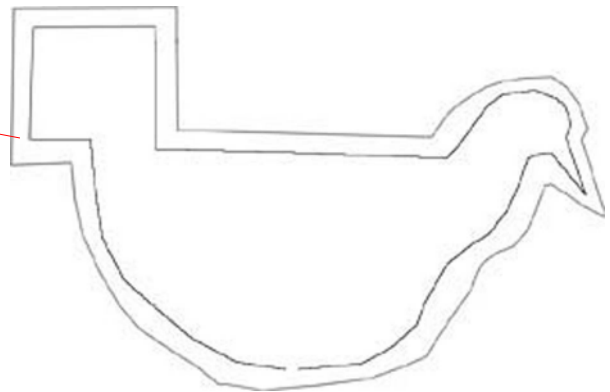
3. MAKING THE PATTERNS

- Once you are content with your basic design, you must create patterns for the different parts.

- Trace over the main parts of the illustration with tracing paper.

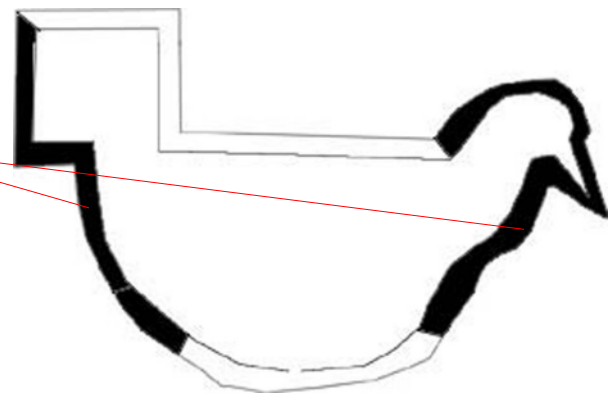


- Add a half-inch margin around all edges.



- Make two copies of the base from the construction material you have selected. For our example, we used heavyweight watercolor paper.

- Glue, tape, or staple along the black area of the diagram.



- Decorate and embellish your base as desired.



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4. ADD THE FOAM INTERIOR AND MAKE THE “FLOTATION DEVICE”

- Carve a piece of florist foam into an oval shape that fits snugly inside the base. Cover the shape with tissue paper and then reinsert the foam into the base.



- For our fantastic flying machine, we carved an egg shape and covered it with instant pulp papier-mache. We then painted the egg with colorful acrylic paints and embellished it with dimensional paint. A dowel was then painted white and inserted into the egg and bird-shaped base. We added rotating pinwheels to the egg using pins and straws.

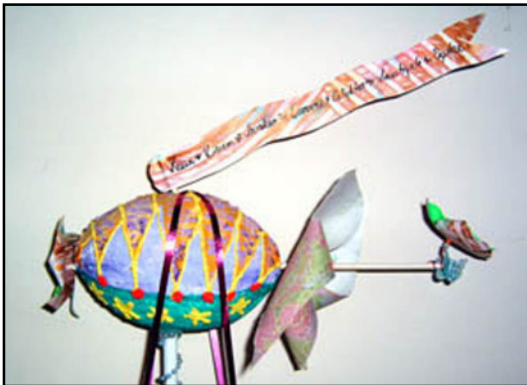


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5. ADD THE DECORATIVE DETAILS

- Use your imagination to decorate and add details to your fantastic flying machine. For our flying machine we added the following:

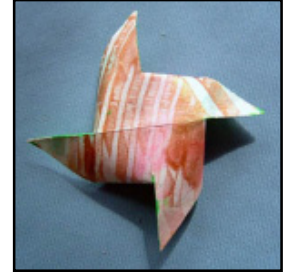
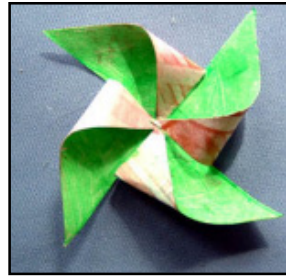
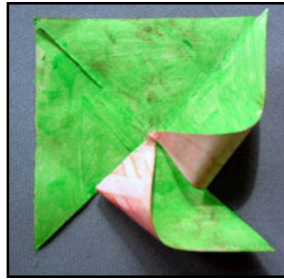
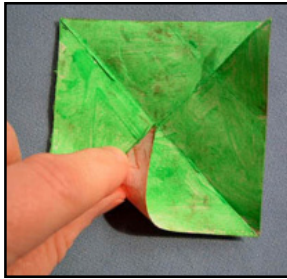
- Feathered wings
- Pinwheels (on the back of the bird base)
- Feathers (atop the bird's head)
- Shiny, purple ribbon (over the egg and down to the bird's sides)
- A strand of pearls (wrapped around the white dowel)
- A miniature cardinal in a basket (tied to the blue pearl strand)
- Two small plastic eyes
- Four painted wheels (on two skewers inserted through the bird base)
- A handwritten paper banner saying, "LEARN * DREAM * AWAKEN * DISCOVER * ENLIGHTEN * INVESTIGATE * QUESTION * EXPLORE"



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6. PINWHEEL CONSTRUCTION

- Cut a square from a sheet of cardstock-weight paper. Fold the sheet diagonally in half and then in half again.
- Cut all four creases halfway to the center.
- Starting at one corner, fold the tip to the center and glue it. Repeat with all four tips.



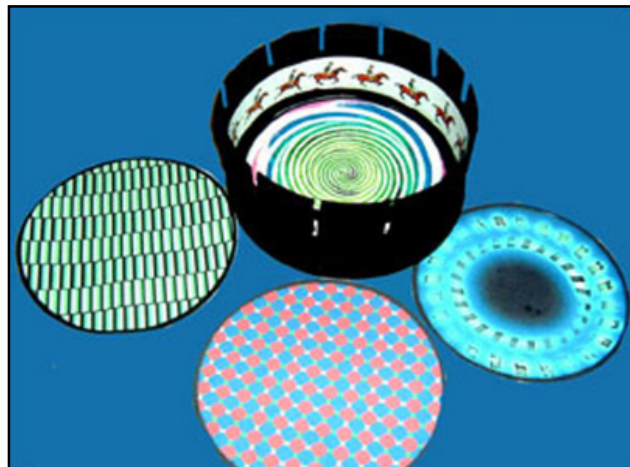
- To make the pinwheel spin freely, insert a stickpin through a bead and then through the center of the pinwheel, followed by another bead. Insert the pin where desired and glue in place.



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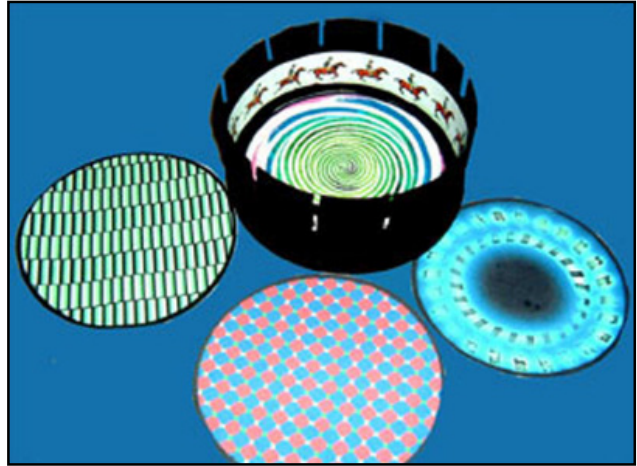
Zoetrope



THE INDUSTRIAL REVOLUTION

Make a Zoetrope

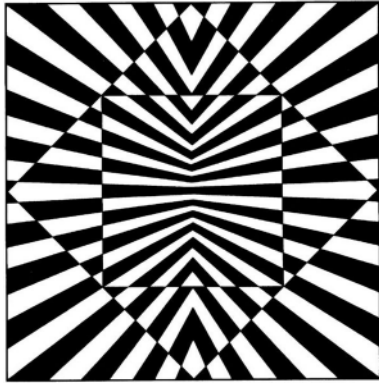
The zoetrope is an optical toy that became popular during the Industrial Revolution. Optical toys (the first efforts at animation) demonstrate the principle of “persistence of vision”: an image remains in the brain for a brief period after seeing it. By breaking down an action into steps, you will be able to create an image that appears to move when viewed through the side of the zoetrope.



MATERIALS NEEDED

- Empty oatmeal container
- Photocopier
- Drawing paper
- Skewer
- Pen, pencil art supplies,
- **X-Acto® knife (ADULT SUPERVISION REQUIRED)**
- Ruler
- Battery-powered, rotating lollipop toy
- Scissors
- Black spray paint

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Zoetrope image suggestions:

- Bouncing ball—the ball moves up and down over six to 12 frames, implying movement along a regular path
- Walking—12 frames of either an animal or human
- Metamorphosis—an insect or animal changes from one form into another, such as caterpillar into a butterfly, a tadpole into a frog, or an egg into a flying bird
- Shape change—one shape “morphs” into another, such as a square into a circle, or a rectangle into a diamond. To change one image into another, keep the following in mind:
 1. Images of a similar size morph the best
 2. Keep the background constant
 3. Keep the position of the image consistent
 4. Keep the images sharp, clear, and bold; avoid a lot of thin lines or highly detailed work
 5. Most morphing requires a minimum of eight frames to transition from one image into another
- Other events—an erupting volcano, a smiling face, an airplane flying, or the sun rising and setting

HELPFUL HINT: Look at books on how to draw simple shapes. Many show how to draw an image from start to finish. If there are more or fewer than 12 steps, make small changes in the images to meet the required number of frames.

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1. CREATING THE FRAMES

- Make a copy of pages 27–28. Select a simple, bold image, such as a ball bouncing or a butterfly flapping its wings.
- Each space represents one frame or drawing.
- In space 1, draw the starting form of the image. Draw its final form in space 12. In space 6, draw the image approximately midway through its motion.
- In the remaining spaces, make incremental changes in shape of the image. Below are possible sequences for legs walking, a butterfly fluttering its wings, and a man on horseback.

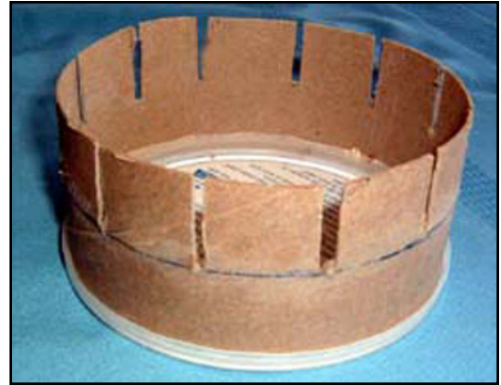
HELPFUL HINT: The image will look better if you view it with a source of light behind you.



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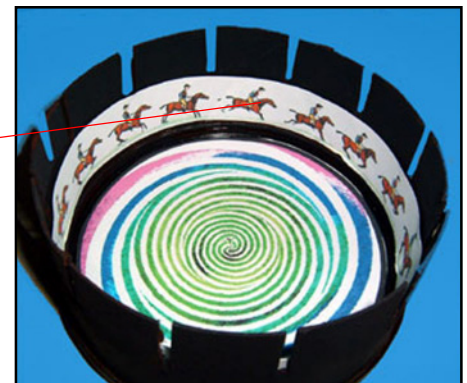
2. MAKE THE ZOETROPE CYLINDER

- **WITH ADULT SUPERVISION**, cut off the bottom two inches of an empty oatmeal container.
- Cut 12 evenly spaced slots in the top of the oatmeal container approximately 1" long and 1/16" wide (as illustrated).
- In a well-ventilated area, spray-paint the inside and outside of the cylinder black. Let dry.



3. OPERATING THE ZOETROPE

- Cut a skewer in half. Insert one end through the center of the cylinder and, **WITH ADULT SUPERVISION**, secure it with hot glue.
- Make a copy of one of the disks on pages 29–30, or make one of your own with cardstock-weight paper, placing it in the bottom of the zoetrope.
- Place the strip you made in step 1 along the bottom edge of the cylinder.
- Insert the skewer into the hole of the rotating lollipop holder. It may be necessary to trim the skewer to fit into this hole.
- Turn on the lollipop holder and look through the slits to see your image move.



THE INDUSTRIAL REVOLUTION

IMAGE FRAME SEQUENCE

In each frame, draw a series of images, each slightly different from the one before it. Redraw the images on (or enlarge, cut out, and glue to) the zoetrope strip. To the “feet” frames, add an upper body. Use your imagination.

1	2	3	4	5	6	7	8	9	10	11	12
											

1	2	3	4	5	6	7	8	9	10	11	12

1	2	3	4	5	6	7	8	9	10	11	12

1	2	3	4	5	6	7	8	9	10	11	12

THE INDUSTRIAL REVOLUTION

ZOETROPE STRIPS

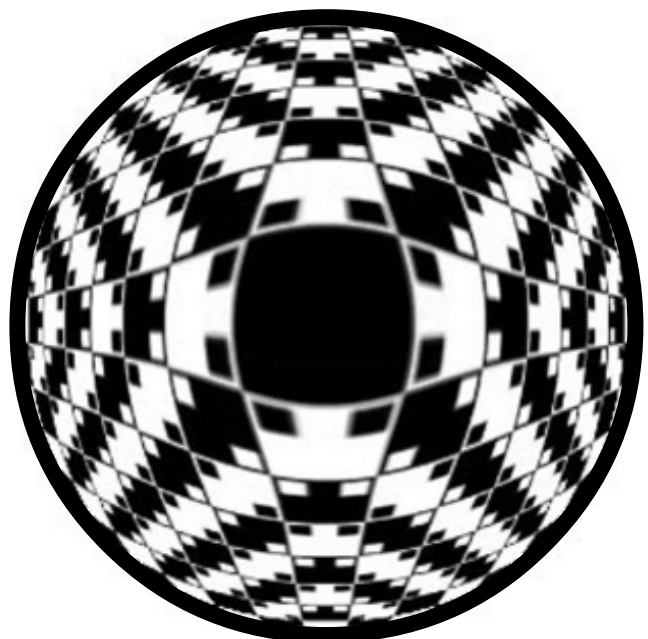
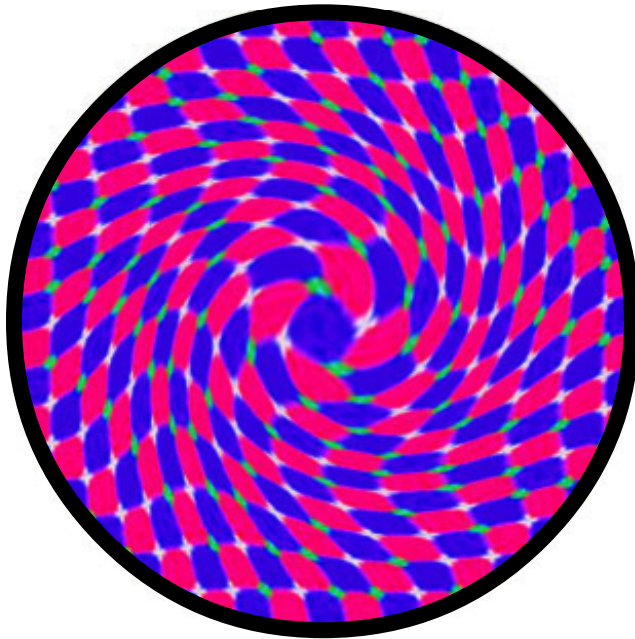
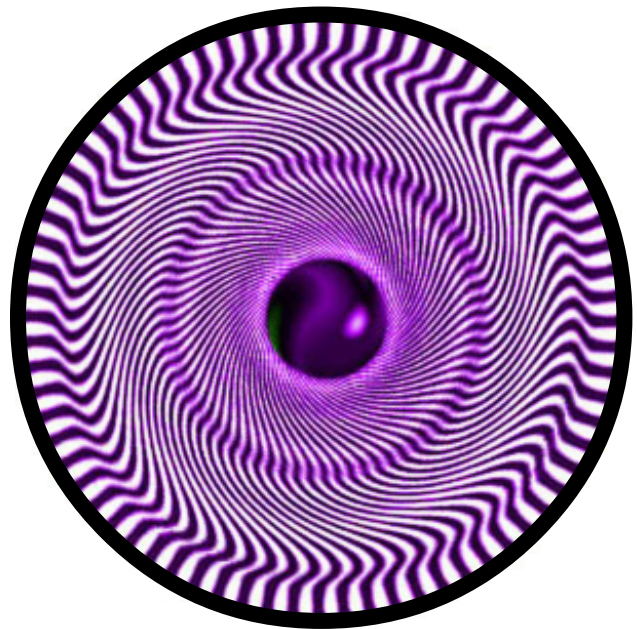
Place a single image in each space on the strip. Glue frame 7 onto the glue tab so it comes after frame 6. Align the strips so the black bars line up with the slots of the zoetrope cylinder.

	1		7		1		7
	2		8		2		8
	3		9		3		9
	4		10		4		10
	5		11		5		11
	6		12		6		12
GLUE TAB				GLUE TAB			

THE INDUSTRIAL REVOLUTION

ZOETROPE DISKS

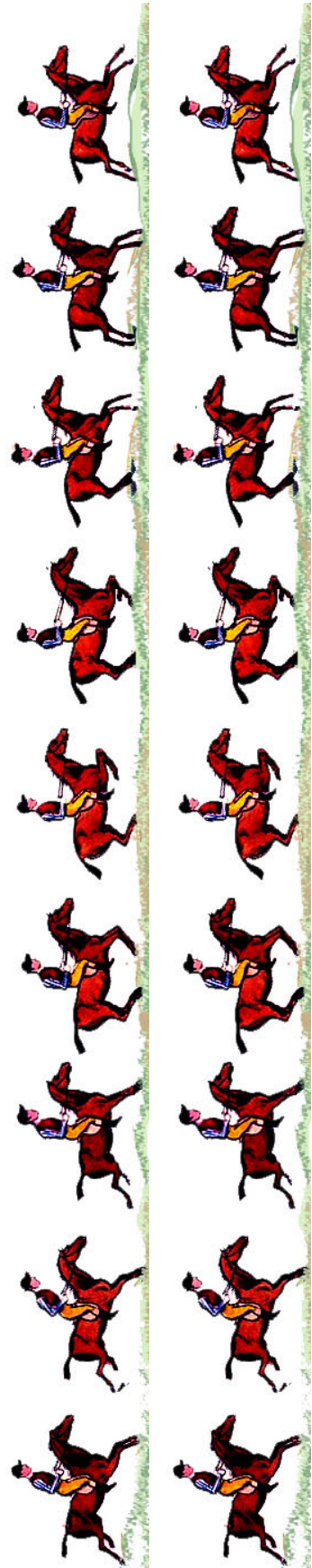
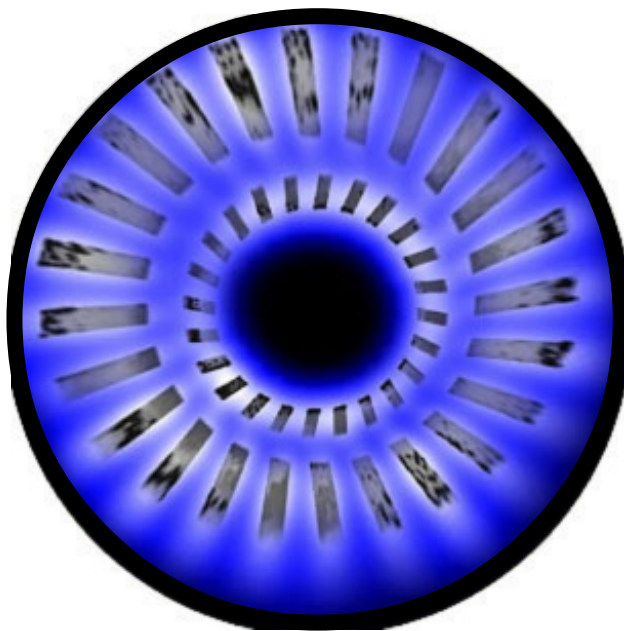
Make a copy of one or more of the zoetrope disks on this and the next page. Mount each disk onto larger disks made from brightly colored cardstock. Place the disk into the bottom of the zoetrope cylinder.



THE INDUSTRIAL REVOLUTION



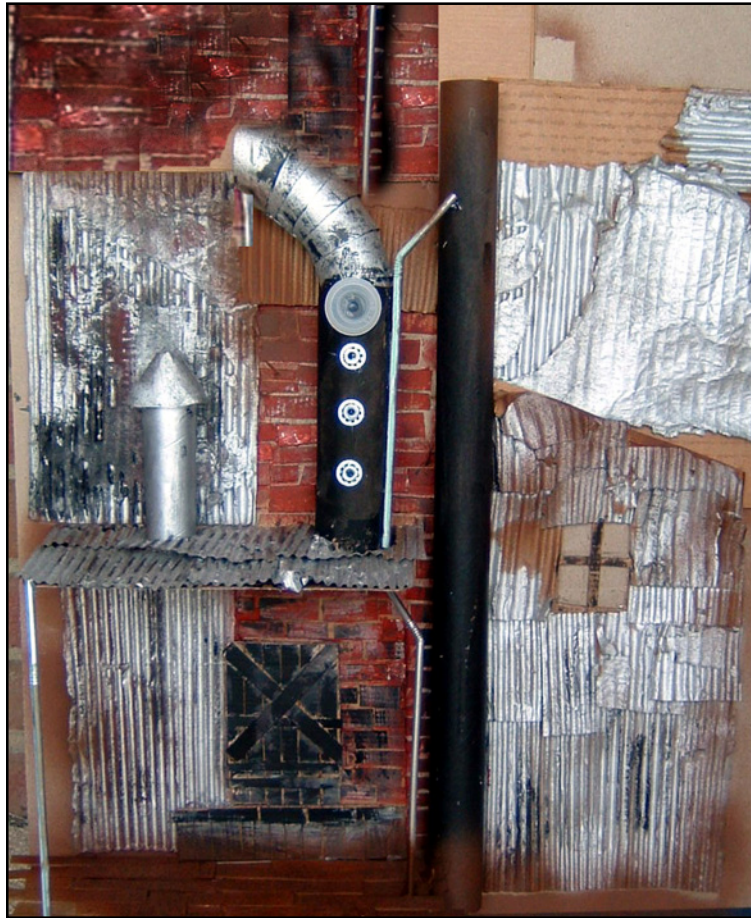
Example of a _____
zoetrope strip



THE INDUSTRIAL REVOLUTION



Factory Relief



THE INDUSTRIAL REVOLUTION

Make a Factory Relief

The advances of the Industrial Revolution forever altered how goods were produced. Items once made by hand were now manufactured in large factory complexes. Whether they turned out steel, automobiles, or textiles, most factory buildings sported an odd assortment of exterior coverings, pipe and duct work, and electrical wiring.

In this activity, you will re-create the outside of an imaginary factory by arranging materials of various textures, configurations, and “industrial” colors.



MATERIALS NEEDED

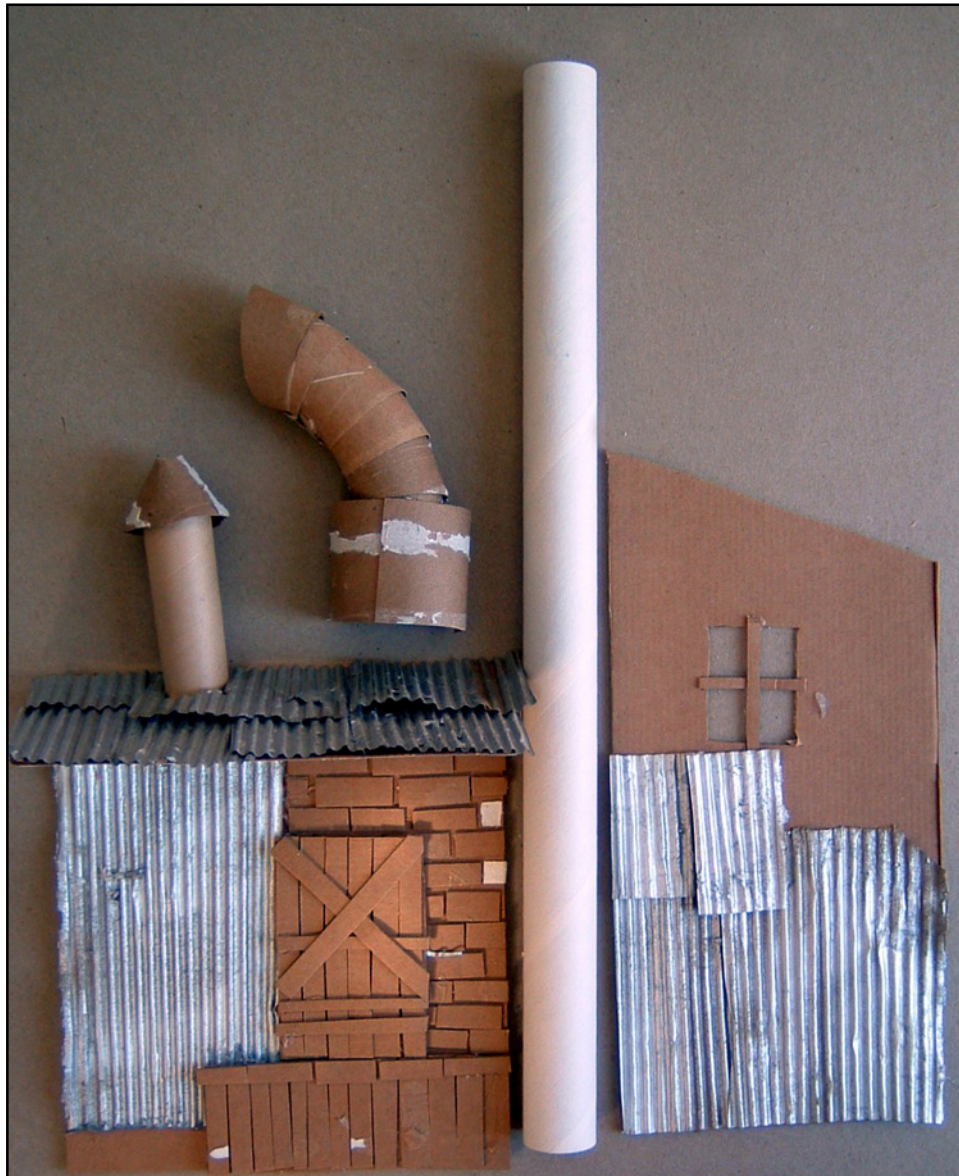
- Scissors
- Scrap pieces of cardboard sheets, cardboard tubes, fluted or corrugated cardboard, straws, bottle caps, etc.
- **Hot glue gun and glue (ADULT SUPERVISION REQUIRED)**
- **Spray paint (silver, brown, and black—ADULT SUPERVISION REQUIRED)**
- Tacky glue
- Plaid FolkArt® acrylic paint (rust red, burnt umber, black, and white)
- Paintbrush
- Scrap styrofoam
- Large piece of foamcore board

THE INDUSTRIAL REVOLUTION

1. MAKE THE FACTORY LAYOUT

- Collect a variety of scrap items you want to use for your relief. First, lay them out in a rough arrangement of how a factory might look. Make a rough sketch of the layout. Shown below is a possible layout of different elements.

HELPFUL HINT: This project is all about three elements: color, texture, and layering. Keeping this in mind will yield a great-looking factory relief.



THE INDUSTRIAL REVOLUTION

2. FACTORY FEATURES

- When you are satisfied with the basic arrangement, begin layering the different parts. The following are some of the ways you can create layers and add texture to your factory.

Galvanized metal roofing and siding:
WITH ADULT SUPERVISION and in a well-ventilated area, spray-paint fluted cardboard silver.

- Add color to the surface of the silver fluted cardboard to highlight the texture and add to the overall appearance.

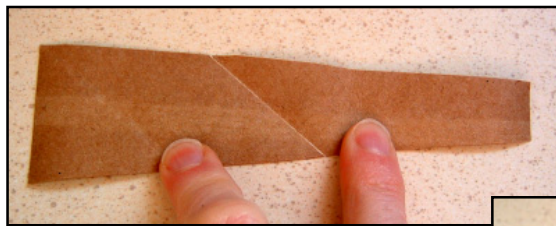


- Add pipes to roof sections by cutting out a small wedge large enough for a cardboard tube.
- Insert the cardboard tube and angle the roof outward.
- **WITH ADULT SUPERVISION,** use hot glue to attach the roof against the background.

THE INDUSTRIAL REVOLUTION

Ductwork: Create ductwork by using pieces of curved styrofoam cut from a wreath-shaped piece.

- Open a cardboard tube but cutting it down one side. Cut the cardboard into several wedges (as illustrated below).
- **WITH ADULT SUPERVISION,** use hot glue to layer the cardboard wedges around the styrofoam shape.



- **WITH ADULT SUPERVISION and in a well-ventilated area,** spray-paint the ductwork silver.
- Glue the assembled duct work to the top of a cardboard tube.

THE INDUSTRIAL REVOLUTION

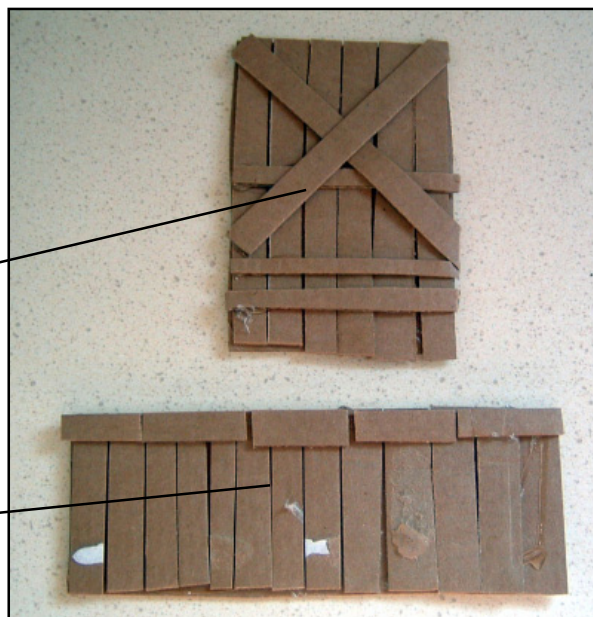
Pipes: Pipes can be made from any kind of cardboard tube (paper towel, toilet paper, wrapping paper, empty potato chip containers, etc.)

- Vary the size and shapes of the tubes as well as the coloring. Paint some pipes silver, and others black or brown.

Doors and platforms: Cut thin strips of cardboard and glue them on top of and across other strips of cardboard (as illustrated below).

- Paint these pieces with either acrylic paint or spray paint.

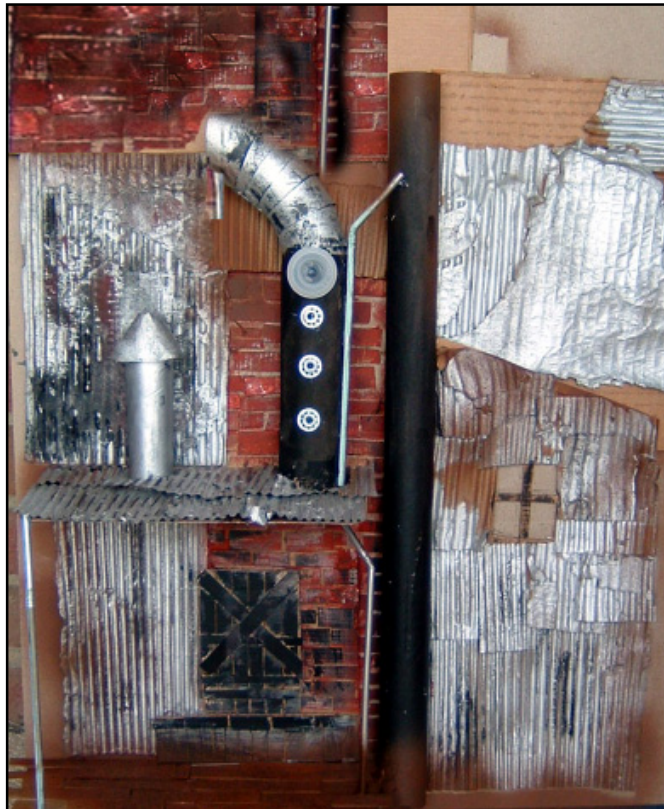
- **WITH ADULT SUPERVISION,** glue the doors and platforms to the relief with hot glue.



THE INDUSTRIAL REVOLUTION

Other details: WITH ADULT SUPERVISION, use hot glue to attach small metal embellishments (such as metal washers, screws, etc.) onto the pipes, ductwork, and siding.

- Add dimensional paint “rivets” along the sides of pipes.
- Cut small pieces of cardboard and glue them onto the background to simulate brickwork. Paint these pieces with a combination of rust red, burnt umber, white, and black acrylic paint.
- Add different sizes of bottle caps, wire mesh, and straws to the layout.



HELPFUL HINT: Look at pictures of factory exteriors. Observe the details and then try to find everyday items to re-create those details.

THE INDUSTRIAL REVOLUTION



3-D Altered-Art Immigrant Display



THE INDUSTRIAL REVOLUTION

Make an 3-D Altered-Art Immigrant Display

One of the first—and most enduring—images seen by immigrants arriving in America was that of the Statue of Liberty. In this activity you will create a museum-style display featuring the image of an immigrant couple and their child before the Statue of Liberty, along with the famous lines of Emma Lazarus's poem "The New Colossus."

MATERIALS NEEDED

- Small canvas
- Old documents
- Plaid FolkArt® acrylic paint (yellow ochre, blue, white)
- Small rocks
- Plastic frame
- Photocopier
- **Mini iron (optional—ADULT SUPERVISION REQUIRED)**
- Scissors
- Beeswax
- Paintbrush
- Glue stick
- Transparency film



THE INDUSTRIAL REVOLUTION

1. PREPARE THE CANVAS AND LAYERS



- Paint the surface of the canvas with your choice of acrylic paints. We selected yellow ochre, blue, and white.

- To add texture and highlights to the canvas, gently dab off some of the wet paint with a clean, damp paper towel.



- Photocopy the Statue of Liberty image on page 44. Tear the image at the edges.
- Use a gluestick to attach the Statue of Liberty image to the painted canvas.

THE INDUSTRIAL REVOLUTION

1. PREPARE THE CANVAS AND LAYERS (continued)



- Make a copy of the “immigrant family” image (on page 45) or an old family picture onto cardstock-weight paper. Color the image if desired, or leave it black-and-white.
- Carefully cut out the image and glue to the canvas in front of the Statue of Liberty.
- Copy the poem “The New Colossus” onto a sheet of transparency film.
- Position the film on the lid of the acrylic frame and carefully cut around the edges of the transparency.
- Use transparent doublestick tape or a transparent glue to attach the transparency to the inside front of the plastic frame.



THE INDUSTRIAL REVOLUTION

2. ADD THE LID

- Carefully position the frame over—but not touching the surface of—the canvas. Use a small amount of transparent tape or silicone glue to hold the frame above the canvas. Display as desired.



THE INDUSTRIAL REVOLUTION

“THE NEW COLOSSUS”

This poem by Emma Lazarus is carved into a tablet on the Statue of Liberty’s pedestal.

The New Colossus

Not like the brazen giant of Greek fame,
With conquering limbs astride from land to land;
Here at our sea-washed, sunset gates shall stand
A mighty woman with a torch, whose flame
Is the imprisoned lightning, and her name
Mother of Exiles. From her beacon-hand
Glowes worldwide welcome; her mild eyes command
The air-bridged harbor that twin cities frame.
“Keep ancient lands, your storied pomp!” cries she
With silent lips. “Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest-tost to me,
I lift my lamp beside the golden door!”

THE INDUSTRIAL REVOLUTION

STATUE OF LIBERTY IMAGE



THE INDUSTRIAL REVOLUTION

IMMIGRANT FAMILY IMAGE



THE INDUSTRIAL REVOLUTION



Pincushion



THE INDUSTRIAL REVOLUTION

Make a Pincushion

The textile industry during the Industrial Revolution operated many “sweatshops.” Whether set up to finish buttonholes, sew on sleeves, or hem a dress, sweatshops were notorious for their poor working conditions. To symbolize the ubiquity of sweatshops during the Industrial Revolution, you will re-create a decorative pincushion. These often took different shapes, such as hedgehogs, birds, shoes, or halves of walnut shells, and were fashioned from metal, mother of pearl, ivory, and wood.



MATERIALS NEEDED

- Polymer clay
- Silver acrylic paint or spray paint, or Rub 'n Buff® silver leaf
- Paintbrush
- Plaid FolkArt® acrylic paint (blue, black, and burnt umber)
- Oven
- Decorative fabric (silk, brocade, velvet)
- Stuffing
- Needle and thread
- Clear glass and metal glue
- Stuffing
- **Hot glue gun and glue (ADULT SUPERVISION REQUIRED)**
- Paper towels
- Pins
- Small beads
- Sculpting tools (optional, but helpful)
- Scissors

THE INDUSTRIAL REVOLUTION

1. FORM THE CLAY BODY

- Pick a simple animal shape or object as the base for your pincushion. The examples below show a hedgehog and a chick emerging from its shell.
- Mold the base out of polymer clay.
- Leave a cavity in the top of the base for the actual pincushion. You want the pincushion to be large enough to easily hold several pins, but still small enough to be delicate.
- Bake the polymer clay according to the manufacturer's directions.



THE INDUSTRIAL REVOLUTION

2. PAINT AND ADD SILVER LEAF



- Paint the clay figure with blue acrylic paint. Let dry.

- There are several options for adding a silver cast to the clay figure, including silver acrylic or spray paint, or Rub 'n Buff® silver leaf. For our figures, we used silver Rub 'n Buff® silver leaf.



- Rub the surface of the clay figure with silver Rub 'n Buff®.
- Apply the clear silver-leaf adhesive to the surface of the figure and let dry.



- With a dry, soft brush, carefully dab on the silver leaf over the tacky surface of the applied adhesive.
- Gently brush away the excess silver leaf from the surface of the clay figure.
- Use a clean, soft paper towel to buff the surface .

THE INDUSTRIAL REVOLUTION

3. "ANTIQUE" THE FIGURE

- Brush the surface of the clay figure with a mixture of burnt-umber and black acrylic paint. Make sure the paint seeps into the cracks and crevices.



- Before the paint dries, use a clean, damp paper towel to remove the excess.



THE INDUSTRIAL REVOLUTION

4. FORM THE CUSHION

- Cut a small circle from a “stretchy” velvet or other decorative fabric.
- Sew around the outside of the fabric using a running stitch.



- Add a small amount of stuffing and pull the thread tightly, cinching the edges of the fabric together. You want the small bundle of stuffing to be firm and tight—not too fluffy—so the pins stick well.

- Tie off the ends securely.
- Trim off any excess thread or fabric.



THE INDUSTRIAL REVOLUTION



5. ASSEMBLE THE PINCUSHION

- **WITH ADULT SUPERVISION,** apply some hot glue to the inside cavity of the clay shape and quickly (yet carefully) insert the tied-off end of the cushion.

- Hold the cushion to the clay shape until the glue has cooled.

- To make decorative stickpins, add small glass beads to pins. Slide the beads down to the pinhead and secure with a tiny amount of clear glass or metal glue.

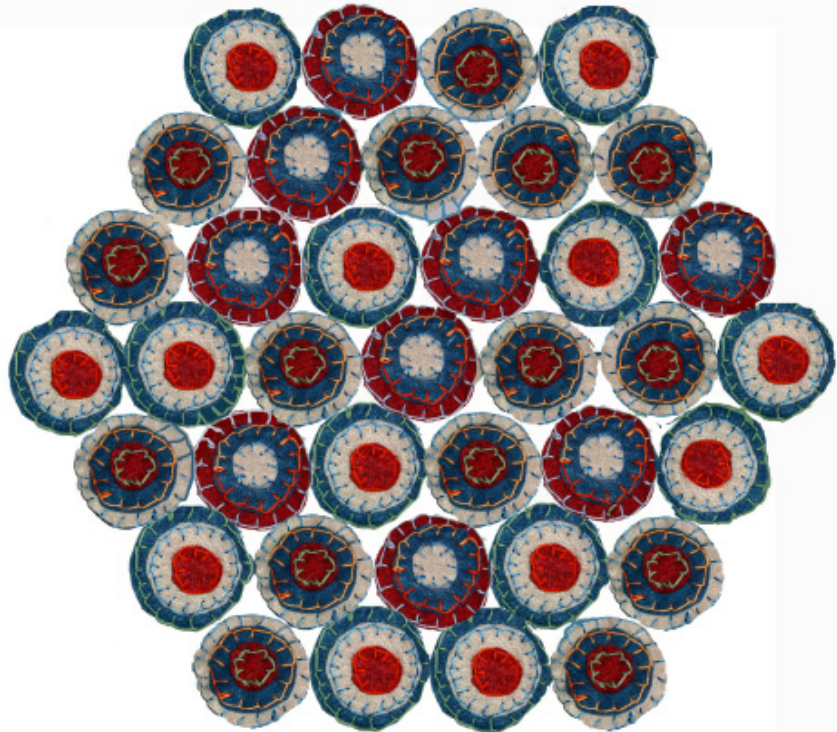
- Add the embellished stick pins and display the pincushion as desired.



THE INDUSTRIAL REVOLUTION



Penny Rug

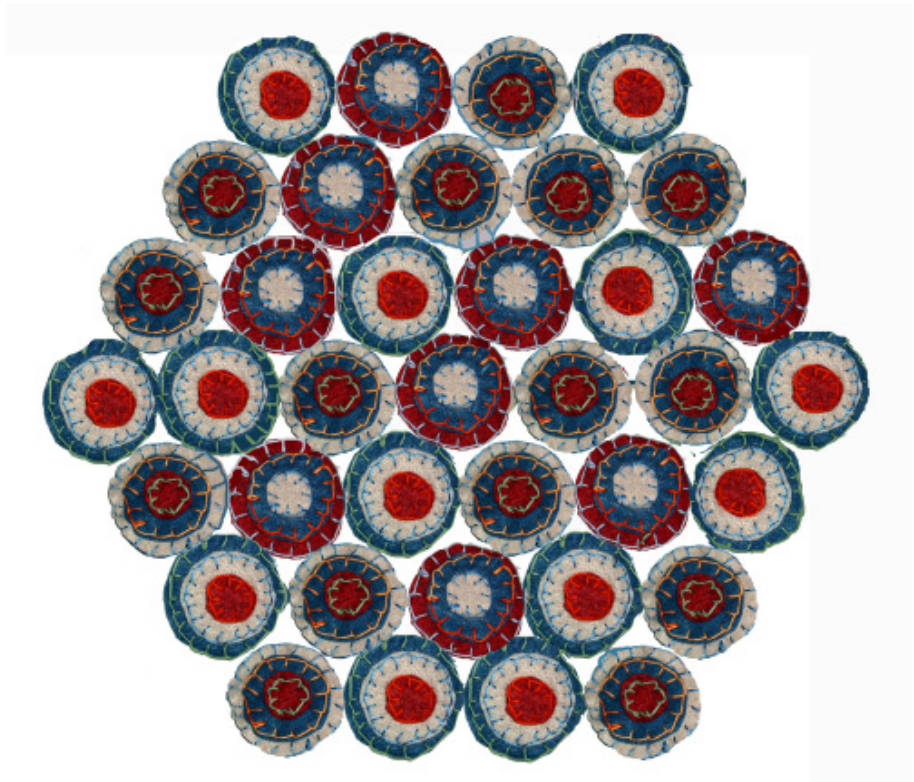


THE INDUSTRIAL REVOLUTION

Make a Penny Rug

Penny rugs were first made in the early 1900s from scraps of wool or felt. They were not used as rugs in the traditional sense, but as table runners and decorative coverings for mantels or other surfaces.

The penny rug got its name from the coins of various sizes used as templates for the wool appliques. Each “penny” was sewn on using a simple overhand blanket stitch. Sometimes actual coins were sewn into the felt to help the finished rug lie flat.



MATERIALS NEEDED

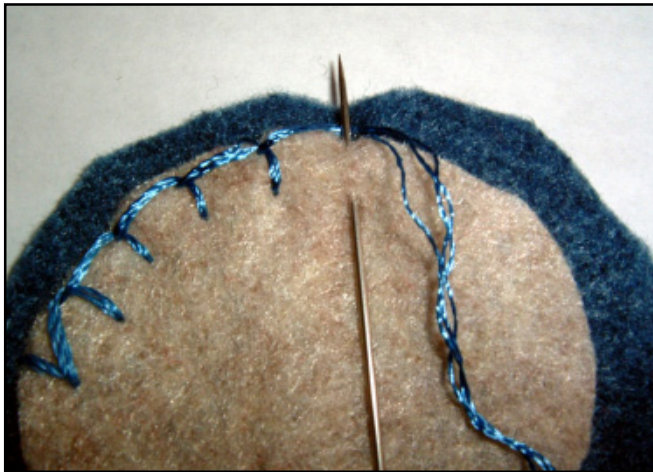
- Scissors
- Coins of various sizes (quarters, half dollars, nickels)
- Embroidery thread
- Embroidery needle
- Various colors of felt



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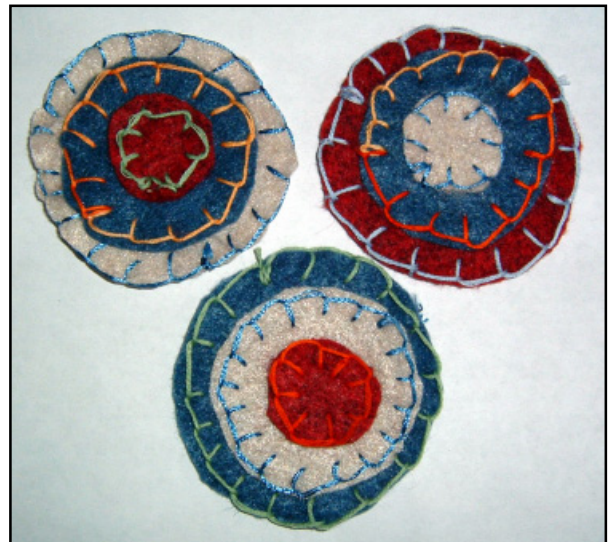
1. MAKE THE CIRCLES

- Determine the finished size you want for your rug.
- Cut out enough small, medium, and large “pennies” to complete the rug. Lids from plastic containers, bottles, and coins are all good choices for templates.
- Arrange the felt circles in layers of contrasting colors. We selected red, cream, and blue for the example.



- Use a simple blanket stitch to attach each circle to the other ones.

- Use embroidery thread of contrasting colors for each layer of felt. The contrasting thread color will add a great deal of appeal to the finished rug.



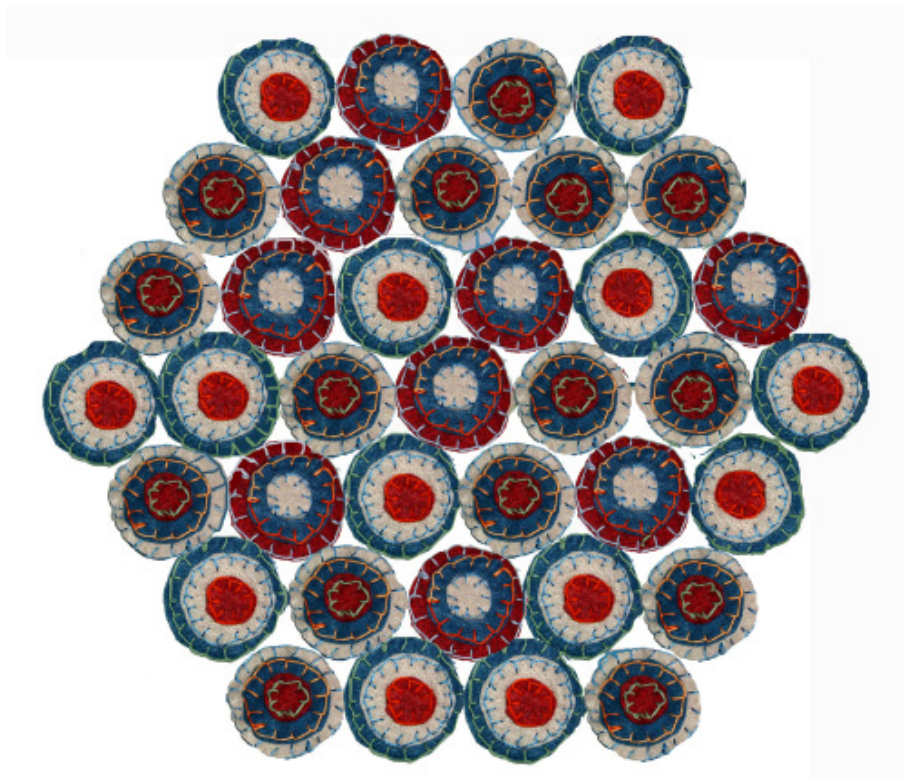
THE INDUSTRIAL REVOLUTION



2. ASSEMBLE THE “PENNIES”

- After stitching together all the pennies, lay them out in the arrangement you desire.
- To assemble the penny rug, simply stitch the large circles together at the center.

HELPFUL HINT: Before stitching, experiment with different color combinations and layouts. We decided to use a random arrangement of pennies.



THE INDUSTRIAL REVOLUTION



“Nodding Donkey” and Oil Deposit Cutaway



THE INDUSTRIAL REVOLUTION

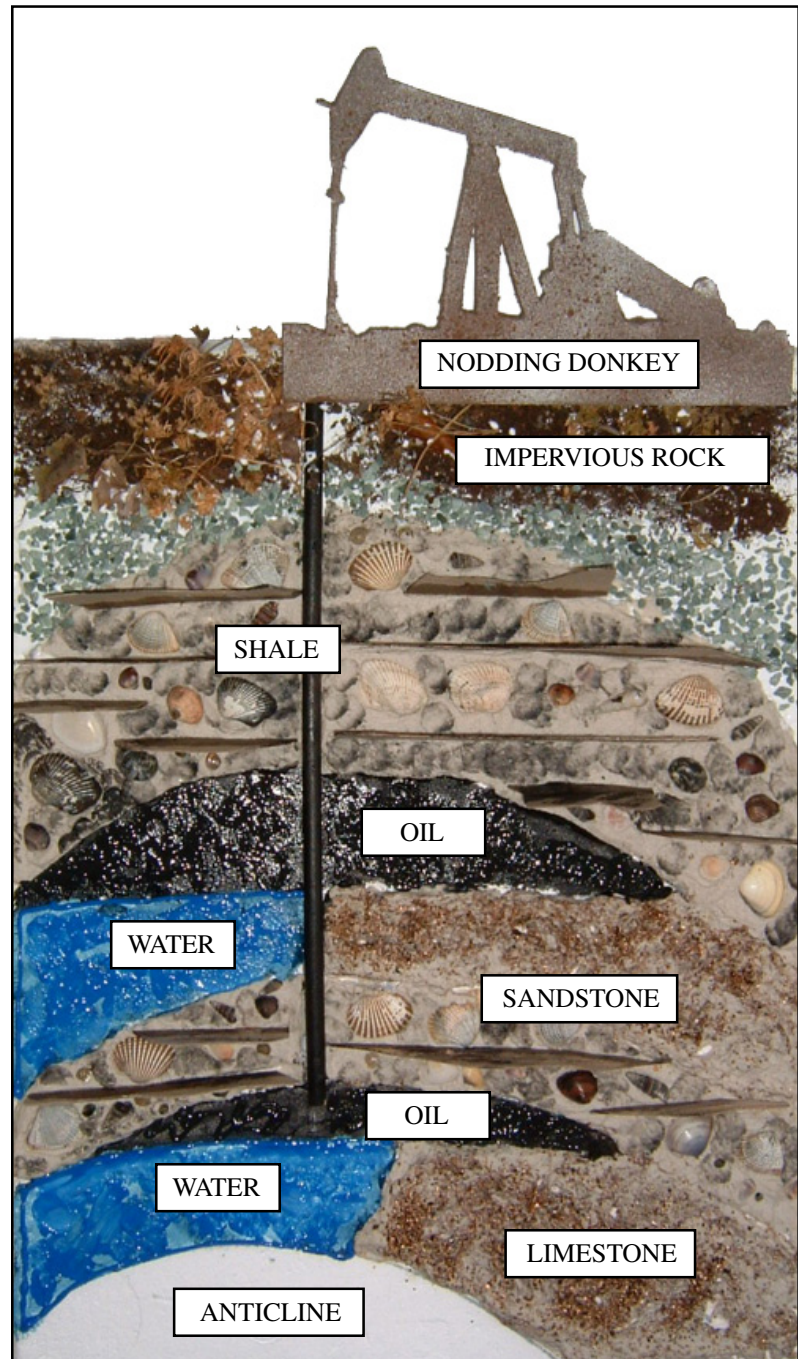
Make a “Nodding Donkey” and Oil Deposit Cutaway

The need for oil increased exponentially during the Industrial Revolution. In order to get to the oil, a drill had to pass through several layers of rock or other materials found below the ground. Often oil was found in pockets between layers of shale or other rock. A “nodding donkey” would then pump it to the surface.

In this activity, you will create a textured diagram of the different layers of rock. You can add items to each layer (suggested below) to help accentuate its composition.

MATERIALS NEEDED

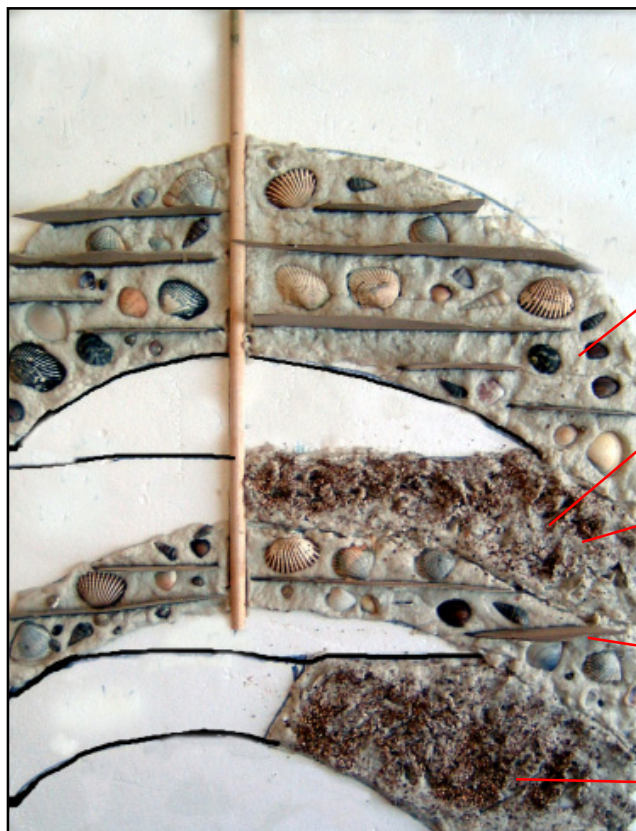
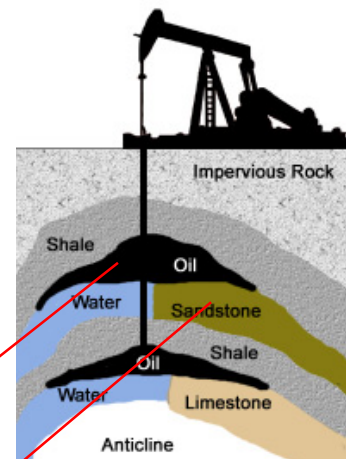
- **X-Acto knife® or sharp scissors (ADULT SUPERVISION REQUIRED)**
- Foamcore board, styrofoam, or drywall
- Plaid FolkArt® acrylic paint (blue, brown, black, silver)
- Paintbrushes
- Natural materials (small rocks, moss, shells, colored sand, textured paper, vermiculite)
- Celluclay® instant pulp papier-mache
- Dimensional paint (black and blue)



THE INDUSTRIAL REVOLUTION

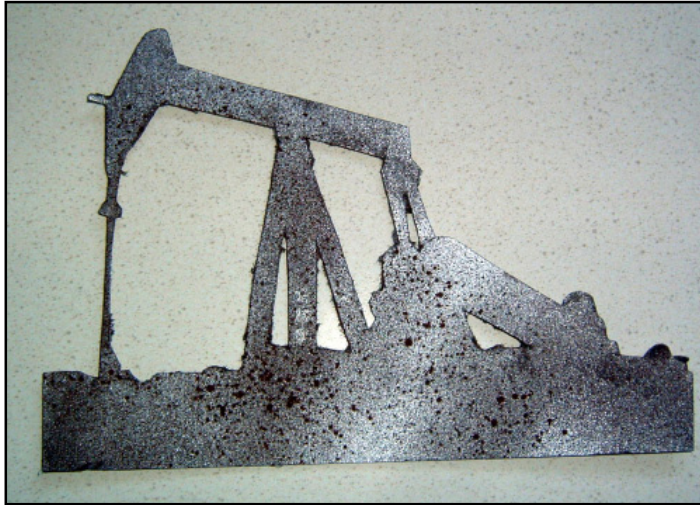
1. PREPARE THE BACKGROUND

- Make a photocopy of the oil-deposit diagram on page 64 or draw the layers onto a sheet of foamcore board, styrofoam, or drywall.
- Select different materials for each layer of the oil deposit. The example below adds instant pulp papier-mache to add texture and division between layers. You may try the following (or use what's available):
 - Impervious rock: different colored sand and small rocks
 - Shale: Celluclay, small shells, thin pieces of cardboard angled vertically out from the display
 - Sandstone: sand and vermiculite
 - Oil: black acrylic and dimensional paint
 - Water: blue acrylic paint
 - Limestone: gravel and vermiculite
 - Anticline: white space
 - Oil pipe: wooden dowel



THE INDUSTRIAL REVOLUTION

2. MAKE THE “NODDING DONKEY”



- Photocopy the nodding donkey silhouette on page 63.
- Glue the image to a sheet of stiff cardboard and cut out using scissors and an X-Acto® knife **(ADULT SUPERVISION REQUIRED)**.
- Paint the nodding donkey with a combination of brown, black, and silver paint. Let dry.

3. ADD COLOR TO THE LAYERS



- After the Celluclay has dried, paint the oil deposits black and the water pockets with shades of blue.
- For added texture and shine, add black dimensional paint over the black paint to simulate oil pools.

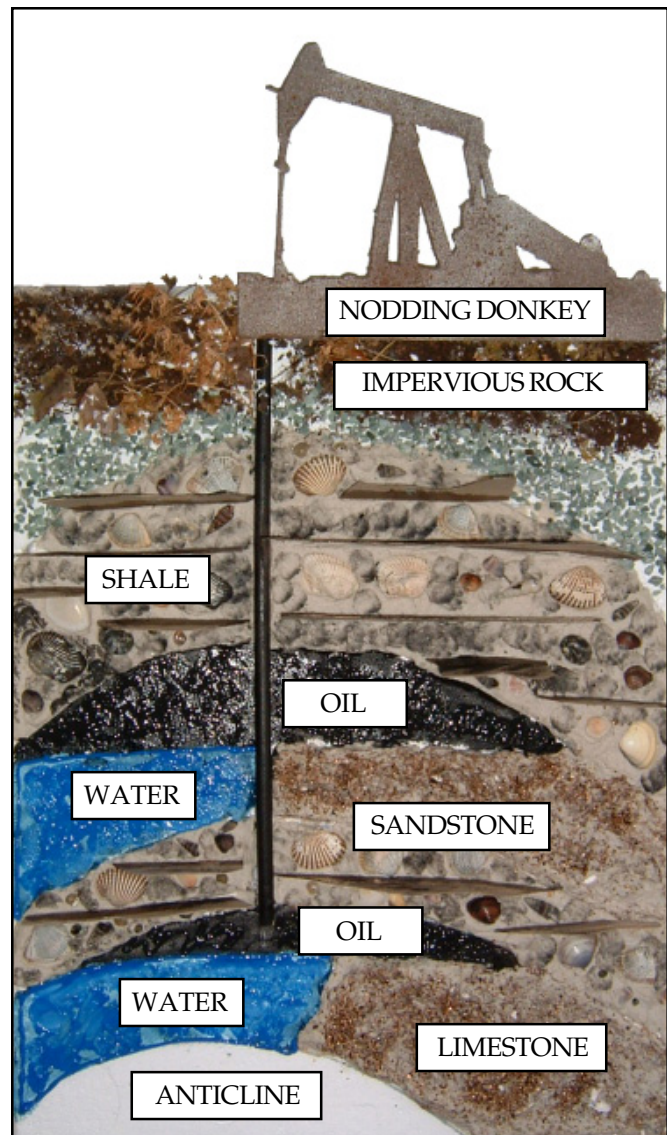
HELPFUL HINT: If you want the oil and water to look like liquids, pour a two-part epoxy mixture into those sections. The epoxy may be a bit more expensive than most materials, but you can use it for future projects. Remember to make and use the epoxy mixture with adult supervision (it's messy).

- Paint the drill pipe black.

THE INDUSTRIAL REVOLUTION

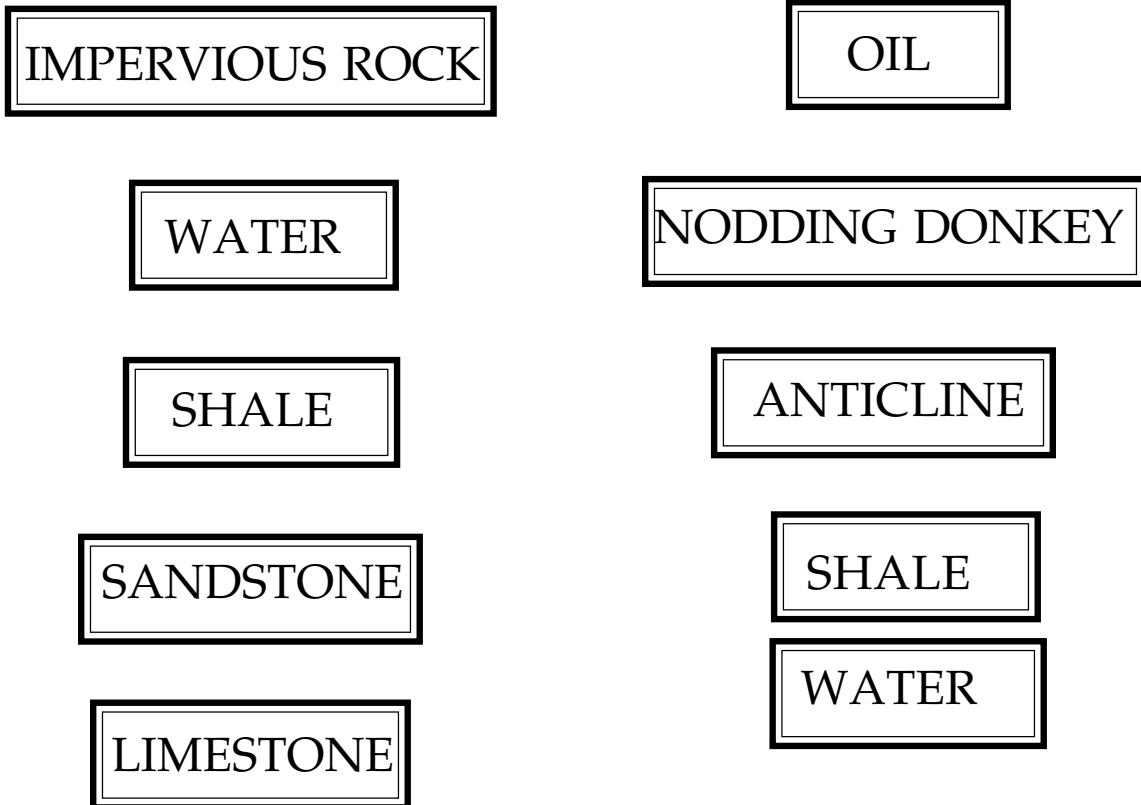
4. ADD THE NODDING DONKEY AND LABELS

- Glue the noddling donkey on top of the black dowel as illustrated.
- Photocopy each of the labels on page 62 (or create your own) and attach them to a sheet of foamcore board. Cut out each label with an X-Acto® knife (**ADULT SUPERVISION REQUIRED**).
- **WITH ADULT SUPERVISION**, use hot glue to attach the labels to their respective layers. Alternatively, don't attach the labels but allow the viewer to try and place each in its correct location; provide a separate answer key showing the correct placement of the labels.



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LABELS

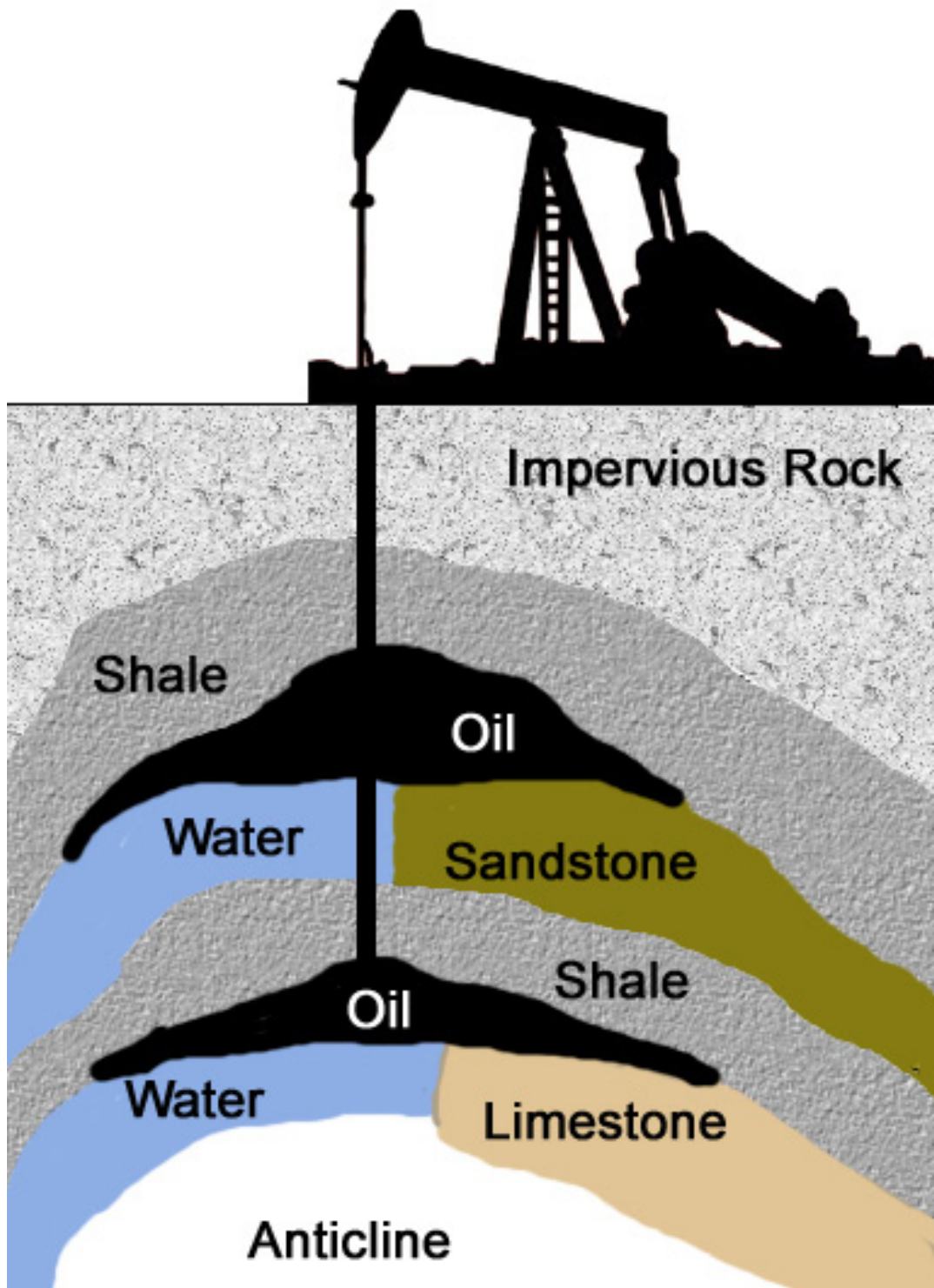


THE INDUSTRIAL REVOLUTION

NODDING DONKEY



THE INDUSTRIAL REVOLUTION



THE INDUSTRIAL REVOLUTION



Battery Model and Fact Book



THE INDUSTRIAL REVOLUTION

Make a Battery Model and Fact Book

In order to store and release electricity, batteries are composed of different chemicals and layers of metal that allow for the transfer of electrons. The following activity shows the components of a common household battery in an enlarged, cutaway form.

MATERIALS NEEDED

- Three sheets of differently colored craft foam or three sheets of textured and colored paper
 - Scissors
 - Dimensional paint (fluorescent green, fluorescent white, and silver)
 - Empty canister (such as a Pringles can)
 - Glitter
 - Plastic test tube
 - Polymer clay
 - Aluminum foil
 - Glue stick
 - Brass wire
 - Light corn syrup
 - **Hot glue gun and glue**
- (ADULT SUPERVISION REQUIRED)**



THE INDUSTRIAL REVOLUTION

1. DETERMINE THE MATERIALS FOR THE BATTERY

To make the interior of the battery, you will need to select items to represent the different parts. Listed below are descriptions of each part, along with the item we have selected to represent them:

A. Container: The part that houses the cell parts to form the cathode; usually made of steel. Our example uses an empty Pringles potato chip container covered with aluminum foil.

B. Electrodes: Where the actual electrochemical reaction in the battery occurs. Our example represents the anode with a sheet of black craft foam. Silver squiggles and glow-in-the-dark paint represent the reaction taking place.

C. Cathode: The electrode reduced by the battery's electrochemical reaction; composed of manganese dioxide and carbon.

D. Anode: The electrode oxidized in the reaction; made of powdered zinc.

E. Separator: Insulates the electrodes from other parts of the battery; usually a piece of non-woven fabric. Our example uses a sheet of red craft foam.

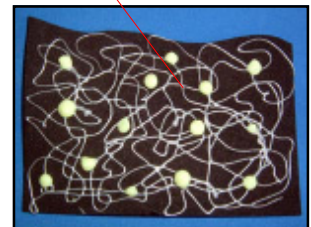
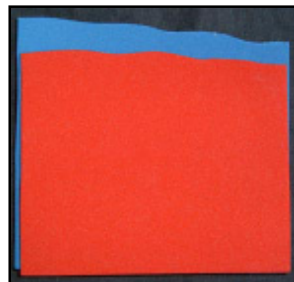
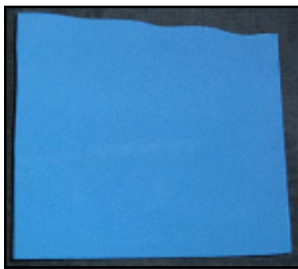
F. Potassium hydroxide solution: The electrolyte solution in which the ions inside the battery cell interact and carry the current. Our example uses a test tube filled with light corn syrup and glitter.

G. Brass pin: Conducts the electricity and carries it outside of the circuit to the negative current collector. In our example, the brass pin is a coiled brass wire inserted into the test tube.

THE INDUSTRIAL REVOLUTION

2. PREPARE THE CANISTER

- Cut the canister in half. Using the bottom half, cut off one side, leaving the bottom of the canister intact.
- Coat the exterior with a glue stick and apply a layer of aluminum foil.
- Select craft foam or paper in three distinct colors or textures for the layers. Our example uses blue, red, and black.
- Cut each layer to fit inside the back half of the canister, making each layer successively shorter to reveal the layer below it.
- On the black sheet, we added silver and glow-in-the-dark dimensional paint details.



THE INDUSTRIAL REVOLUTION

3. CREATE THE BATTERY CHAMBER

- **WITH ADULT SUPERVISION**, drill a small hole through the top of a plastic test tube lid.

- Wrap a brass wire around a skewer or pencil to create a coil. Leave about 4" uncoiled.



- Fill the test tube with light corn syrup and sprinkle in some glitter.

- Place the coil into the test tube and through the hole in the lid. Twist the coil sticking through the top.

- **WITH ADULT SUPERVISION**, use hot glue to secure the lid to the test tube and to seal the hole where the wire comes out.

- Roll out a small amount of polymer clay and press the bottom of the test tube into the clay to create a recessed area. Remove the test tube and bake the clay according to manufacturer's directions.

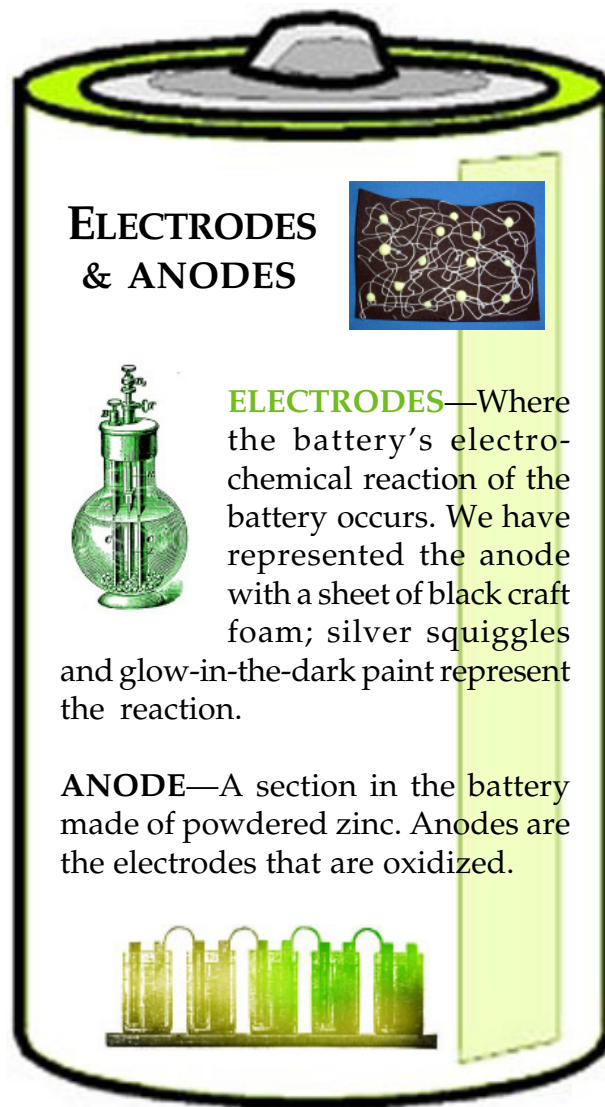
- **WITH ADULT SUPERVISION**, use a small amount of hot glue to set the test tube into the clay.



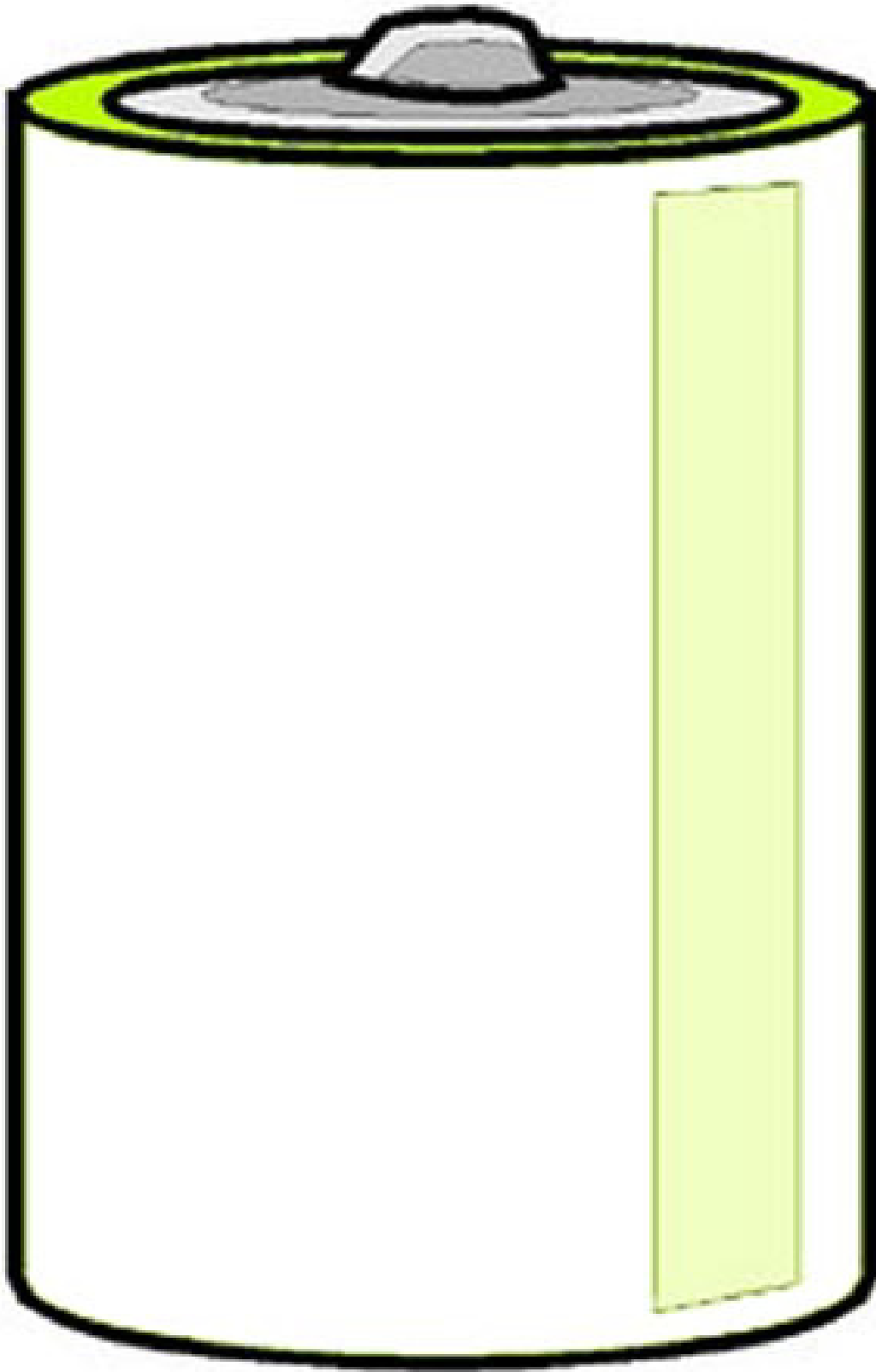
THE INDUSTRIAL REVOLUTION

3. MAKE THE BATTERY FACT BOOK

- Make at least six copies of the battery template on page 71 for each component of the battery.
- On each copy, write information about that particular part of the battery. You may also wish to include pictures.
- Make a front and back cover using the battery pattern as a template. Decorate the front cover with pictures such as those on page 72. Below is one possible layout.



THE INDUSTRIAL REVOLUTION



THE INDUSTRIAL REVOLUTION



EXTENSION ACTIVITIES FOR GRAPHICS

1. DESCRIPTIVE VOCABULARY

Trace only the image's outline, leaving the inside space empty. Write words inside the empty space about the culture or time period being studied.

2. STAMPS

Make stamps out of craft foam using smaller copies of the motif . (Craft foam is a thin, dense, easily cut and glued foam available at most craft or fabric stores.) Glue the selected shapes onto pieces of foamcore board or wood. Use as you would any type of rubber stamp.

3. RUBBINGS

Make a photocopy of the design. Glue it onto a sheet of tag board or posterboard. Cut out the shape and glue it onto another sheet of the same material. Use dimensional paint to outline the edges of the designs and let dry. Place a piece of paper over the slightly raised design and make a rubbing of the design.

4. COLLAGE

Enlarge the design (if necessary) and use a variety of collage materials to decorate the interior of each design. Use decoupage medium to layer different papers, threads, and lightweight fabric over the design. Embellish with dimensional paint.

5. STENCILS

Copy the designs onto cardstock. Use an X-Acto[®] knife to carefully cut out the interior of each design. (Don't try to cut out the details on the inside of each motif—just the outline of the design). Use stencil paint to transfer the shape onto other surfaces. Embellish with dimensional paint if desired.

6. "STAINED GLASS" PICTURES

Make a transparency of the design. Outline the design with Plaid Gallery Glass[®] leading and let dry. Fill the spaces inside the leading using Plaid Gallery Glass[®] Window Color. Tape the finished design onto a window for a "stained glass" effect.

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7. TOOLING FOIL

There are a variety of different colored “tooling foils” available at craft and fabric stores. The foil is thicker than aluminium foil but easy to “tool” with simple tools such as a pencil or pen. Make a copy of the design. Tape the design onto the foil. Trace over the design to transfer it onto the metal surface. For a unique look, use Plaid Gallery Glass® Window Color on the metal to give it an enameled appearance. Mount as desired.

8. FABRIC DESIGNS

Transfer the designs onto muslin fabric using either fabric transfer paper, pens, or a technique of your choice. Use embroidery thread, yarn, fabric paint, and/or iron-on fabrics to decorate the motifs.

9. SANDPAPER DESIGNS

Make a copy of the design. Place a piece of carbon paper underneath the copy and place onto a sheet of sandpaper. Trace over the design to transfer it onto the sandpaper. Use chalk, colored pencils, or some other medium to decorate the motifs.

10. HANDMADE PAPER

There are many different books available on how to make handmade paper. It is an easy and fun activity that only requires basic supplies and offers a wonderful textured finish when completed. Use handmade papers as a background surface or collage materials for the designs.

11. BOTANICAL COLLAGES

Make a copy onto a heavier cardstock paper. Select a variety of grains such as rice, beans, pasta, etc. to glue on the inside of each shape.

12. HIGHLIGHTING WITH METALLIC PAINT.

Plaid also offers a product called Tip-Pen Essentials®. This is a craft tip set (for use with Plaid FolkArt® acrylic paints), which allows for fine lines, beads and lettering. This set is easy and fun to use. After the design has been decorated as desired, consider using acrylic paints with the Tip-Pens to add details.

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13. "PLASTER CARVINGS" AND CLAY TILES

This activity requires more supervision, but can offer two activities in one.

- a. Use a small cardboard box measuring approximately 8½" x 11". Line the interior with aluminum foil. Mix a sufficient quantity of plaster of Paris and pour into the interior of the box. Allow to harden and dry. Remove the dried plaster from the box.
- b. Place a copy of the design onto the surface of the plaster and trace over the design until it is transferred onto the plaster below. Remove the copy and use linoleum tools to carefully go over the design to further accentuate the motifs.
- c. To make the tiles, use polymer clay that has been rolled to an even thickness and is the size of one plaster form. Place the clay on top of the side of the plaster that has the design and press the clay evenly and firmly onto the carved design. Remove the clay and bake as recommended on the package.
- d. Decorate the tile as desired using Plaid FolkArt® acrylic paints.

14. PIERCE-PATTERN PAPER

Piercing the motif with a needle will add interesting dimension and texture to the design. Use heavy cardstock paper for this project. Tape or glue a copy of the selected motif onto one side of the cardstock. Place the paper onto a piece of cardboard. Use a darning needle or nail or experiment with different piercing tools (such as tacks, needles, toothpicks, etc.) that create different sizes of holes. Vary the pattern of the holes being made by changing the direction: go in circles, on the diagonal, vertically, or horizontally. Create shapes such as stars, circles, etc. within the shapes.

15. HEAT-TRANSFER-TO-WOOD TRIVET

Make a reduced-size photocopy of a selected design the size of the trivet you wish to make. Place the reduced design so it faces downward onto a smooth piece of wood that fits the size of the paper. Use a very hot iron to "transfer" the copy onto the wood. Use acrylic paints to decorate the transfer. Use clear acrylic sealer to protect the design.

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16. COPY-MACHINE-TO-FABRIC TRANSFER

Create your own fabric transfer on a copy machine. This is very easy and effective. All you need is an iron, freezer paper, muslin, and tape. Place an 8½" x 11" piece of prewashed and ironed muslin onto a slightly larger piece of freezer paper (place the muslin on the "shiny" side of the freezer paper). Iron the freezer paper until it adheres completely to the muslin. Cut around the edge of the muslin so the freezer paper is the same size as the muslin. Tape the edges around all sides of the muslin and freezer paper. This will help prevent peeling while the design is being printed. Select a design and place it onto a copy machine, and hand-feed the muslin into a copy machine. The design, transfer onto the muslin. Use fabric, acrylic, and dimensional paints to decorate the design. After the paint has completely dried, remove the freezer paper and mount as desired.

17. COPY-MACHINE-TO-POLYMER-CLAY TRANSFER

This is a fun and easy way to make jewelry using polymer clay and a photocopy of a motif. Reduce a design to the size you desire or use one provided on the page. Roll out a piece of polymer clay approximately 1/8" thick and the size of the photocopy. Place the photocopy face down onto the polymer clay. Use a clean paintbrush to apply isopropyl alcohol (rubbing alcohol, available at any pharmacy) to the back side of the photocopy. Keep applying the alcohol until the paper is saturated. Let sit for at least five minutes to allow the alcohol time to dissolve the ink. Apply more alcohol and very gently begin rubbing away the back of the paper until the ink is transferred onto the clay. Bake the clay according to package directions and mount onto a piece of jewelry or use as part of a collage. **DON'T FORGET TO REVERSE THE COPY SO IT WON'T BE PRINTED BACKWARDS.**

