

# LETTER TO PARENTS

---

---

## SCIENCE NEWS

---

---

Dear Parents,

Our kindergarten class is beginning a study of wood and paper. We will be looking at the properties of wood and paper (texture, color, absorbency, flexibility, etc.) and how different kinds of wood and paper are alike and different. Then we will investigate how wood and paper can be processed as we sand wood, make simulated plywood, recycle paper, and laminate wood and paper strips into simulated plywood and papier-mâché bowls. Finally, we will use what we have learned about the properties of materials to make constructions (weaving, taking apart boxes, and making sculptures).

The children need to bring one or two empty paper boxes (cereal boxes, cracker boxes, paper-clip boxes, or other small boxes) to school by \_\_\_\_\_(date).

We can also use your help to gather scrap paper and wood scraps for making our final projects. Fabric scraps will also be used. We welcome contributions of interesting paper to share (wrapping paper, crepe paper, wallpaper, tissue paper, etc.) and fabric samples. Please send paper scraps by \_\_\_\_\_(date). We will be needing a variety of small pieces of scrap wood and fabric by \_\_\_\_\_(date).

After students do the various activities in the module, they may ask you to help them do things at home, such as temporarily label things with the word “paper” or “wood,” waterlog a stick, take boxes apart and tape them back together, or make collages, usable envelopes, drinking cups, and paper hats. You can help by making the materials available and letting your child create.

Sincerely,



---

---

## SCIENCE NEWS

---

---

Dear Parents,

Our kindergarten class is beginning a study of wood and paper. We will be looking at the properties of wood and paper (texture, color, absorbency, flexibility, etc.) and how different kinds of wood and paper are alike and different. Then we will investigate how wood and paper can be processed as we sand wood, make simulated plywood, recycle paper, and laminate wood and paper strips into simulated plywood and papier-mâché bowls. Finally, we will use what we have learned about the properties of materials to make constructions (weaving, taking apart boxes, and making sculptures).

The children need to bring one or two empty paper boxes (cereal boxes, cracker boxes, paper-clip boxes, or other small boxes) to school by \_\_\_\_\_(date).

We can also use your help to gather scrap paper and wood scraps for making our final projects. Fabric scraps will also be used. We welcome contributions of interesting paper to share (wrapping paper, crepe paper, wallpaper, tissue paper, etc.) and fabric samples. Please send paper scraps by \_\_\_\_\_(date). We will be needing a variety of small pieces of scrap wood and fabric by \_\_\_\_\_(date).

After students do the various activities in the module, they may ask you to help them do things at home, such as temporarily label things with the word “paper” or “wood,” waterlog a stick, take boxes apart and tape them back together, or make collages, usable envelopes, drinking cups, and paper hats. You can help by making the materials available and letting your child create.

Sincerely,



# WOOD LABELS

.....

This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>

# CENTER INSTRUCTION CARD

## WOOD AND WATER



### MATERIALS

Droppers	Wood samples in containers
Sponges	Water in plastic cups
Paper towels	Clear basins
Newspaper	

### SET UP THE CENTER

Put a dropper at each student's place and a cup of water for each pair of students to share. Have basins of water nearby so they can be easily moved to the center when needed. Set out the containers of wood samples for students to take as needed—each student needs one sample of each of the five kinds of wood.

### GUIDE THE INVESTIGATION

- Drop Water on Redwood and Particleboard.** Each student should take one sample of redwood and of particleboard. Have students put one drop of water on the surface of both samples, then carefully observe what happens. Next have them put a drop of water on the end of both samples and observe.
- Monitor Progress and Discussion.** Encourage students to discuss what happens when they drop water on the wood samples. Guide their observations by asking questions.
  - *Does water sit on the pieces of wood or does it soak in?*
  - *How does it soak in? (Does it get absorbed right away, or does it take some time?)*
  - *Does the color of the wood change when it gets wet?*
- Drop Water on the Other Samples.** Let students take the other three wood samples (basswood, plywood, and pine) and continue the investigation by dropping water on those samples.
- Use Basins of Water.** Collect the cups of water and droppers. Ask students what they think will happen if they put the wood samples in a tub of water. Put a basin of water on the table for each pair of students to share. Let students put their samples of wood into the water one at a time. (All the samples should float.)

**NOTE:** Students often discover that when the samples get completely soaked they will stick together. Challenge students to see how many samples will stick together when they pick them up.
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Prepare the Station for the Next Group.** Remove the water basins from the table but keep them handy for the next group. Spread the wood samples out on newspaper to dry overnight.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

absorb

communicate

float

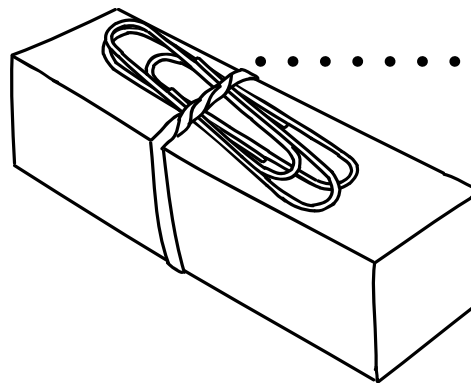
sink

soak

spread

# CENTER INSTRUCTION CARD

## SINK THE PINE AND PLYWOOD



### MATERIALS

- |                               |                 |
|-------------------------------|-----------------|
| Basins half filled with water | Pine samples    |
| Jumbo paper clips in cups     | Plywood samples |
| Rubber bands in a cup         | Paper towels    |
| Sponges                       | Newspaper       |

### SET UP THE CENTER

Set the clear basins of water on the table so that each pair of students will be able to use one. Put cups of jumbo paper clips near each basin and rubber bands in the center of the table within easy reach of all students. Have the pine and plywood samples ready for distribution.

### GUIDE THE INVESTIGATION

- Discuss Sinking.** Show students the paper clips and rubber bands. Ask students to see if they can use these materials to sink the two kinds of wood.
- Begin the Exploration.** Distribute one sample of pine and plywood to each student. Let students start a free exploration of sinking. (If students are stumped, show them how to place a rubber band around a piece of wood and slide a paper clip under the rubber band.)
- Quantify the Results.** When students have mastered a technique for attaching paper clips to wood, challenge them to find out how many paper clips are required to sink each piece.

**NOTE:** Many kindergartners will not use a systematic method to determine how many paper clips it takes to sink the wood. They love to stick on as many paper clips as they can. Let them use their own method regardless of its accuracy.

- Ask Questions to Guide Discussion.**
  - Were you able to sink the wood by attaching paper clips?*
  - How many paper clips did you use to sink the wood?*
  - Let's compare the two samples. Does it take the same number of paper clips to sink both kinds of wood?*
  - Does it make a difference where you put the paper clips on the wood? All on one side? Evenly distributed around all sides?*
  - Why does adding paper clips make the wood sink?*
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Clean Up for the Next Group.** Have students take all the paper clips and rubber bands off the wood samples and put them back in their containers. Lay the wet wood samples on newspaper to dry. Dry the paper clips after all the groups are finished.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

- |       |         |      |        |
|-------|---------|------|--------|
| above | compare | sink | weight |
| below | float   | test |        |

# CENTER INSTRUCTION CARD

## SINKING INVESTIGATION



### MATERIALS

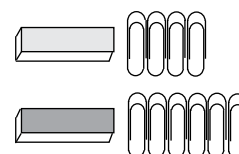
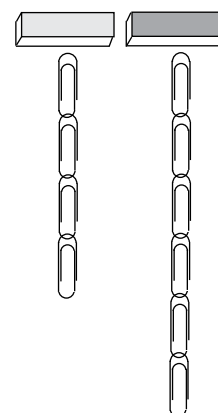
- |                       |                           |
|-----------------------|---------------------------|
| Particleboard samples | Basins of water           |
| Redwood samples       | Rubber bands in a cup     |
| Sponges               | Jumbo paper clips in cups |
| Newspaper             | Paper towels              |

### SET UP THE CENTER

Set the basins of water on the table so that each pair of students will be able to use one basin. Put a cup of paper clips near each basin and rubber bands in the center of the table within easy reach of all students. Have the two kinds of wood ready for distribution.

### GUIDE THE INVESTIGATION

- Sink the Wood Samples.** Have students use the following procedure to sink each piece of wood in a systematic fashion. Give the wood samples to students one at a time, redwood first, then particleboard. (A sample is not sunk until it lies flat on the bottom of the basin.)
  - Put a rubber band around the sample.
  - Slip one paper clip under the rubber band and drop the sample in the water to see if it floats.
  - Slip another paper clip under the rubber band on the sample. Test to see if it still floats.
  - Continue this procedure, testing after each paper clip is added, until the sample sinks.
  - Set the piece of wood aside with the rubber band and paper clips still in place.
- Make Bar Graphs.** After students have sunk both of the wood samples, have them make a graph. Take the paper clips off each sample, working with one sample at a time. Have students place the sample of wood on the table and lay the paper clips vertically or horizontally, as shown in the illustrations.
- Ask Questions about the Graph.**
  - Which piece of wood took more paper clips to sink, the redwood or the particleboard? How could you tell without counting paper clips?
  - Which piece of wood took fewer paper clips to sink?
  - How many paper clips did it take to sink the redwood? The particleboard?
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Clean Up.** When you have finished discussing the graph, get the center ready for the next group. Return paper clips and rubber bands to their containers, and put wood samples on newspaper to dry overnight. Dry the paper clips after all the groups are finished.



### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

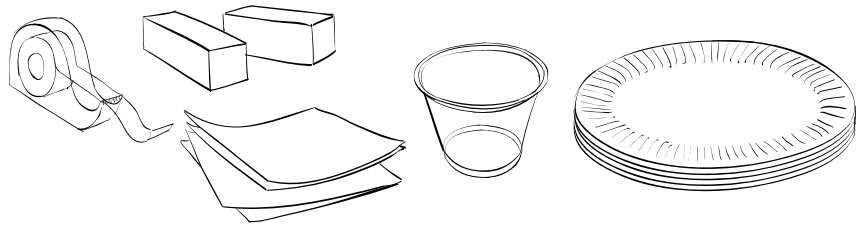
- |       |       |      |
|-------|-------|------|
| fewer | graph | sink |
| float | more  | test |

# CENTER INSTRUCTION CARD

## SANDING WOOD

### MATERIALS

- Sandpaper
- Basswood samples for sanding
- Paper plates
- Plastic cup
- Transparent tape



### SET UP THE CENTER

Put a paper plate and a piece of basswood at each student's place. Keep the sandpaper out of the reach of students until you are ready to have them begin.

### GUIDE THE INVESTIGATION

- Let the Sanding Begin.** When students are settled, distribute one piece of sandpaper to each student. Let them begin sanding the basswood. Tell them to keep the dust from the sanding on their paper plates.
- Discuss the Results.** As students sand the wood, ask them to share their observations about what happens when they rub the wood with the sandpaper. Guide the discussion by asking questions. (Focus on changing the shape of the wood, not on making it smoother.)
  - How do you change the shape of the wood?*
  - What is the best technique for sanding?*
  - How does the wood feel after you sand it?*
  - What has fallen onto the plate?*
  - Where does the wood dust come from?*
  - How does the dust feel?*
  - What are the black dots mixed in with the sawdust? Where do they come from?*
- Collect the Wood Dust.** Use the plastic cup to collect the sawdust from each student's plate. Tell students that you are saving the dust for another project.
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Clean Up.** Prepare the center for the next group. The paper plates should be reused. The wood pieces and sandpaper can also be reused, but you will have to check the condition of both and replace them if necessary.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

change

sand

sandpaper

sawdust

shape

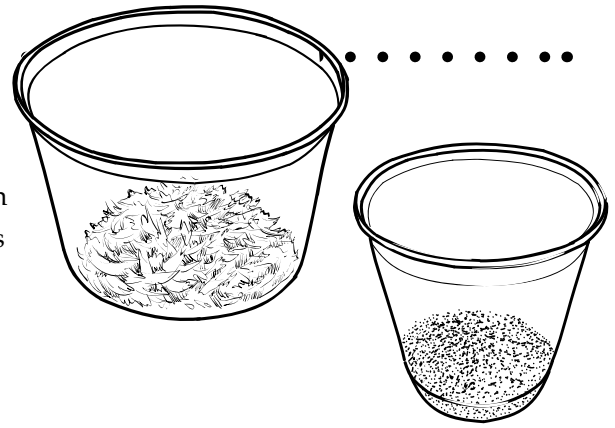
woodworker

# CENTER INSTRUCTION CARD

## SAWDUST AND SHAVINGS

### MATERIALS

Shavings (larger particles) in containers	Plastic spoon
Sawdust (smaller particles) in cups	Paper towels
Screens	Water
Paper plates	Craft sticks



### SET UP THE CENTER

Put one heaping spoonful of sawdust in one plastic cup and one heaping spoonful of wood shavings in a 1/2-liter container for each student. Put all the materials on a table or counter close by so they will be within easy reach for distribution to students.

### GUIDE THE INVESTIGATION

1. **Explore the Sawdust.** Give each student a cup of sawdust and a craft stick. Let students explore the sawdust for a minute or two.
2. **Explore the Wood Shavings.** Give each student a container of wood shavings. Allow 2–3 minutes for students to explore this new wood material.
3. **Combine the Two Materials.** Ask students to *pour the sawdust into the wood-shavings* container. Observe what happens. Have students use their sticks to stir the mixture.
4. **Drop the Sawdust and Shavings in Water.** Fill each student's empty cup half full with water. Ask students what they think will happen if they sprinkle the sawdust and shavings on the water. Let them try it. Encourage students to look through the side of the cup as well as from the top.
5. **Discuss the Relative Position of the Wood in the Water.** Ask students to report what they observed. Ask them to describe the position of the pieces of wood in the water. Are they above the surface, below the surface, on the bottom? Help them describe the location in relation to one reference, either the surface of the water or the bottom of the cup. [The pieces of wood floated at first, but then began to sink. They were at the surface of the water. Some went to the bottom of the cup.]
6. **Discuss Results.** Explain,  
*When water soaks into wood, we say the wood is waterlogged. Waterlogged wood sinks.*
7. **Strain Out the Wood Pieces.** Ask students how they could separate the water and wood pieces. Show them a screen. Have each student place a screen on top of the 1/2-liter container and pour the water with the sawdust and shavings mixture from the cup through the screen, catching the water in the container. Have them dump the sawdust and shavings caught in the screen onto a paper plate. Then let them explore the wet wood pieces. Ask,
  - *How are the pieces of sawdust and wood shavings different now?*
8. **Add to the Word Bank.** Add new or important words that students use to the word bank.
9. **Clean Up.** Get the center ready for the next group. Spread the wet sawdust and shavings on a piece of newspaper to dry overnight. Wipe out the cups so they are clean for the next group. Put a heaping spoonful of shavings in the containers and a heaping spoonful of sawdust in the cups for the next group.

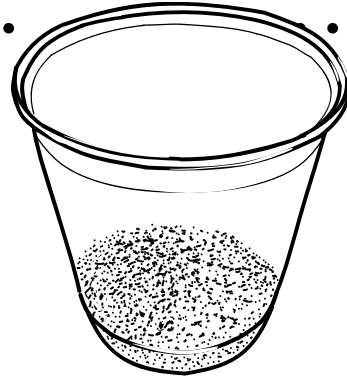
### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

mixture                  sawdust                  screen                  shavings                  waterlogged

# CENTER INSTRUCTION CARD

## MAKING SAWDUST WOOD



### MATERIALS

Craft sticks	Particleboard samples
Paper plates	Containers of cornstarch matrix
Sawdust in cups	Scratch paper
Plastic spoons	Paper towels

### SET UP THE CENTER

Put a plastic cup with two heaping spoonfuls of sawdust at each student's place. Keep the other materials at the end of the table where you have easy access to them.

### GUIDE THE INVESTIGATION

1. **Review Working with Sawdust.** Tell students that today they will use a homemade glue to stick the sawdust together to make particleboard, or sawdust wood.
2. **Distribute the Cornstarch Matrix.** Show students the cornstarch matrix and tell them that it is a kind of glue made from cornstarch. Pass the 1/2-liter containers of matrix around the group. Help each student put one heaping spoonful in his or her cup of sawdust.
3. **Stir Up the Mixture.** Have students use their craft sticks to mix the sawdust and matrix together. When it is well mixed, have them dump it on a paper plate and continue using their fingers to do the mixing. The final product should be the consistency of modeling dough. Monitor students' progress and add additional matrix or sawdust if necessary.
4. **Shape the Sawdust Wood.** Have students shape the sawdust dough in any way they want. Have students make observations while they are working and compare their wood to others.
5. **Let the Wood Dry Overnight.** Set the newly formed pieces of sawdust wood on scratch paper to dry overnight. Write students' names on the paper next to the wood pieces.
6. **Add to the Word Bank.** Add new or important words that students use to the word bank.
7. **Clean Up.** Wipe out the used cups with a paper towel. Refill them with two spoonfuls of sawdust. Refill the 1/2-liter containers with cornstarch matrix as needed for the next group. Reuse the paper plates.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

cornstarch

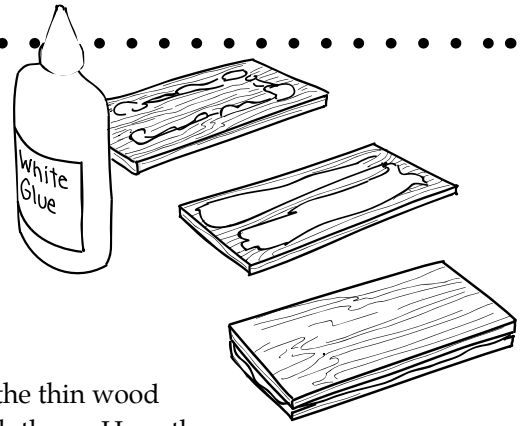
glue

mix

particleboard

# CENTER INSTRUCTION CARD

## MAKING SANDWICH WOOD



### MATERIALS

Newspaper mats	Thin wood pieces
White glue	Pencil
Paper towels	Craft sticks

### SET UP THE CENTER

Put a piece of folded newspaper at each student's place. Pile the thin wood pieces in the center of the table where students can easily reach them. Have the white glue ready for distribution when needed.

### GUIDE THE INVESTIGATION

1. **Make "Sandwich Wood."** Have each student choose three thin wood pieces. Go around the group and squeeze a quarter-size pool of glue onto the far side of each student's newspaper mat. Let students begin gluing the pieces together.

**NOTE:** Make sure students put glue on both surfaces they are gluing together, spread the glue over the entire surface of each piece, and hold the pieces together for a count of 20 after each piece of wood is added.

2. **Add to the Word Bank.** Add new or important words that students use to the word bank.
3. **Clean Up.** Find a location where the wood can dry overnight. Label students' pieces of plywood by writing their names right on the wood sandwich. Replace the newspaper mats for the next group of students, or use the same sheets turned inside out if they are not covered with too much glue.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

break

laminated

layer

plywood

strong

# PAPER LABELS

---

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

This is made of **paper.**

# CENTER INSTRUCTION CARD

## WRITING AND DRAWING ON PAPER



### MATERIALS

- Containers of paper samples
- Pencils
- Crayons
- Markers

### SET UP THE CENTER

Place the containers of paper samples close to the learning center so you and students can pick up samples as needed. Have pencils, crayons, and markers on the table for students to use.

### GUIDE THE INVESTIGATION

- Compare the Samples.** Place the containers of tagboard and paper-towel samples on the table. Ask students to take one sample of each paper. Discuss how the papers are alike and how they are different.
- Mark the Samples with Pencils and Crayons.** Tell students to make some marks on each sample with pencils and then with crayons. Discuss which paper provides the best surface for writing or drawing.  
**NOTE:** It is OK if the paper gets ripped or gets a hole in it. That's valuable information.
- Use a Marker.** Tell students to make marks on the paper samples with a marker. Compare the results of the marks on the two kinds of paper. Discuss how the ink from the marker soaked into the paper towel (or the paper towel absorbed the ink). Compare this to the tagboard, which did not absorb much ink.  
**CAUTION:** Roll up sleeves! Marker ink on waxed paper beads up and can cause a mess.
- Mark the Other Samples.** Let students explore making marks on the other paper samples, using the pencils, crayons, and markers. Ask questions to guide their discoveries.
  - Is this a good paper for writing a letter? Why or why not?*
  - Does the ink from the marker soak into this paper or stay on the top?*
  - What makes paper easy to write or draw on? What makes it hard to write or draw on?*
  - Find two papers that feel the same when you write on them. How are they the same?*
  - Find two papers that feel different when you write on them. How are they different?*
  - How did you feel when you were writing on the corrugated (bumpy) paper?*
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Clean Up.** Collect all the paper samples for the next group to use. Paper samples can be reused many times.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

- |        |         |
|--------|---------|
| absorb | smooth  |
| bumpy  | soak    |
| rough  | tear    |
| slick  | texture |

# CENTER INSTRUCTION CARD

## FOLDING PAPER

### MATERIALS

Containers of paper samples

### SET UP THE CENTER

Put the newsprint samples at the center of the table. Have other paper samples ready to use as needed.

### GUIDE THE INVESTIGATION

- 1. Fold the Newsprint.** Let each student take one newsprint sample. Have students fold it in half once. Monitor them to make sure they understand the concept of folding in half. Have them continue folding until the paper can't be folded any more.
- 2. Count the Number of Folds.** Have students count the number of folds by unfolding their samples and counting each time they open up a fold.
- 3. Fold the Other Papers.** Put the other containers of paper samples on the table. Let students take one of each to see how many times they are able to fold them.
- 4. Ask Questions to Guide Discussion.**
  - *What kinds of paper are easy to fold, and what kinds are difficult?*
  - *What makes some kinds of paper easy to fold, and other kinds difficult?*
  - *What does a piece of paper look like after it has been folded and then opened up?*
  - *How many times do you think you could fold a facial tissue?*
  - *Why would people want to fold paper?*
  - *What could you make by folding paper?*
- 5. Sort the Paper Samples.** When students have finished folding all their samples, ask them to sort the samples into two piles: those that were easy to fold and those that were more difficult to fold. Discuss the properties of paper that affect how easy it is to fold.
- 6. Add to the Word Bank.** Add new or important words that students use to the word bank.
- 7. Clean Up.** Collect the samples and save them for future activities. Each new group will need samples that have not been previously folded. (It's OK to use samples that have been written or drawn on.)

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

bend

corner

crease

flat

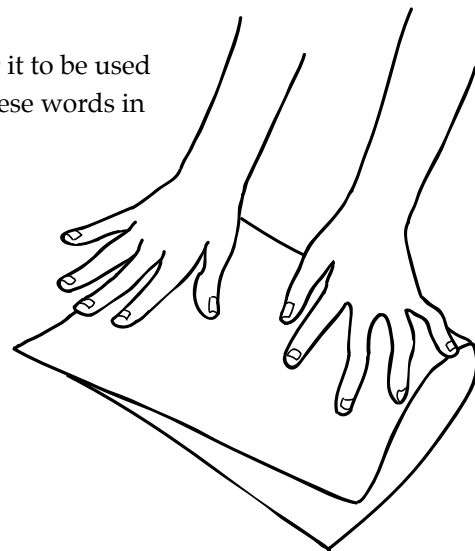
fold

half

strong

thick

thin



# CENTER INSTRUCTION CARD

## PAPER AND WATER

### MATERIALS

Containers of paper samples

Sponges

Basins of water

Droppers

Cups of water

### SET UP THE CENTER

Place a dropper and a cup with a small amount of water at each student's place. Have the containers of paper samples ready for students to pick up at the center. Keep sponges on hand for possible spills. Have 2 basins of water at hand.

### GUIDE THE INVESTIGATION

- Drop Water on the Paper-Towel and Tagboard Samples.** Have students pick up one sample of towel and tagboard. Ask students to drop water on the two samples and watch what happens. Encourage students to put only one drop at a time on each of the paper samples and to make careful observations. Ask them to compare what happens with the two different samples.
- Drop Water on Remaining Samples.** Let students choose two more samples, and continue until they have worked with as many paper samples as they are interested in.
- Ask Questions to Guide Observations and Discussion.**
  - *Compare what the water does on each sample. How is it the same, and how is it different?*
  - *Which samples would be good for soaking up spills? Why do you think so?*
  - *Are there any samples that would be good to wrap things in to protect them from water?*
  - *Which papers stayed the same, and which changed? How did they change?*
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Soak Paper Samples Overnight.** After students have finished dropping water on the paper samples, ask them what they think the samples would look like if they were soaked in water overnight. Show students the basins of water, have them choose one sample to soak overnight, and let them put the samples in one of the basins.
- Clean Up.** Collect the wet paper samples and spread them out to dry.  
The dried samples can be used again.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

bead

change

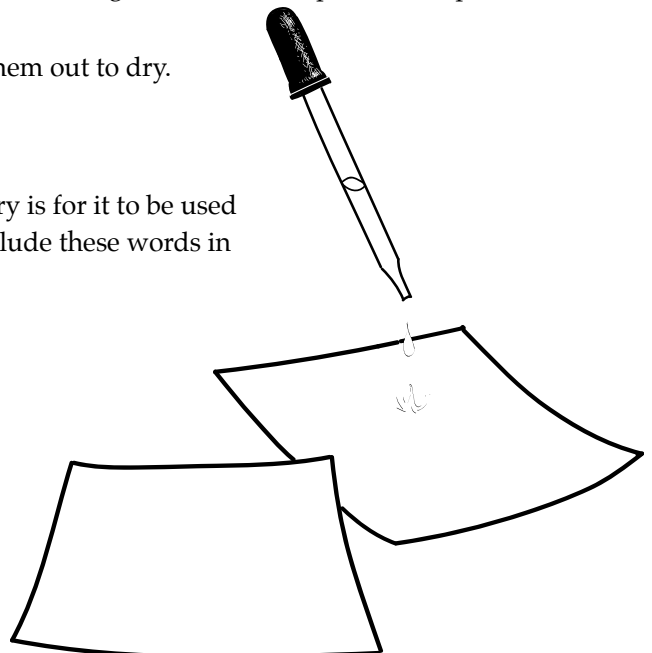
drop

dropper

float

submerge

wet

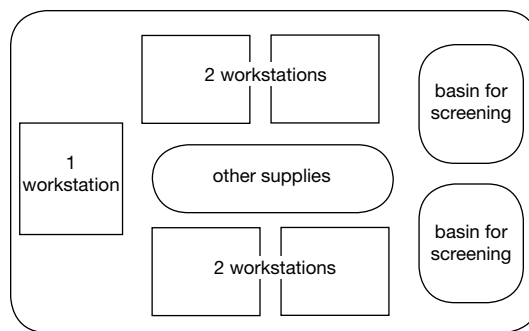


# CENTER INSTRUCTION CARD

## PAPER RECYCLING

### MATERIALS

Newspaper mats	Sponges
Bottles with caps	Basins
Toilet tissue	Containers
Pitcher of water	Screens
Waxed paper	Self-stick notes



**Paper recycling center**

### SET UP THE CENTER

At each student's place put two folded sheets of newspaper, a bottle with a cap, and an eight-sheet length of toilet tissue. Fill a pitcher with water and keep it near the center. Place the waxed-paper pieces and sponges in the center of the table. At the end of the table, set up a screening station. Put a 1/2-liter container in each basin. Keep the screens nearby.

### GUIDE THE INVESTIGATION

- 1. Make the Paper Pulp.** Have students stuff the toilet tissue into the empty bottles. Add water until the bottle is about two-thirds full. Have students screw the cap securely on the bottle and shake it. It takes about 3–5 minutes for the paper to break down into pulp.
- 2. Screen the Pulp.** Call two students at a time to the screening station. Have each student
  - a. Place a screen on the 1/2-liter container.
  - b. Shake the pulp onto the screen. (Students will need to shake the bottles or bump the ends of the bottles to get the pulp out. Add a little more water if all of the pulp won't come out.)
  - c. Place a second screen on top of the pulp to make a screen-and-pulp "sandwich."
- 3. Soak Up the Water and Roll Out the Paper.** Send students back to their workstations with the screen-and-pulp "sandwiches" to finish the process. Have each student
  - a. Lay the screens and pulp on top of a newspaper mat.
  - b. Place a sponge on top of the screen and press to remove as much water as possible.
  - c. Take off the top screen. Flip the second screen over onto waxed paper.
  - d. Roll a bottle over the paper pulp to press more water out and make it a thin, smooth piece of paper. Use the sponge to blot water from the waxed paper.

**NOTE:** Roll from the middle to the edges to prevent the paper from curling around the bottle.

### 4. Ask Questions to Guide Discussion.

- *What happens to the pieces of tissue when you add the water? When you shake it up?*
- *Where does the water go when you press the pulp with the sponge?*
- *What happens when you roll the bottle over the paper?*
- *What does the paper look like when it begins to dry?*
- *Compare the recycled paper to the tissue used to make the pulp.*

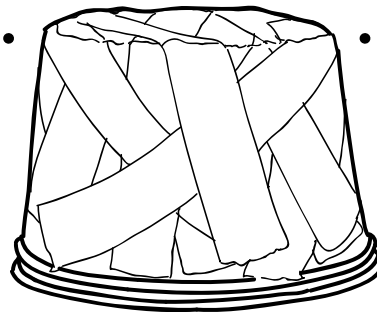
### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

absorb	fiber	pattern	recycle	screen
blot	flip	pulp	roll	

# CENTER INSTRUCTION CARD

## PAPIER-MÂCHÉ



### MATERIALS

- |                                 |                       |
|---------------------------------|-----------------------|
| 1/2 sheets of newspaper, folded | Wheat paste           |
| Newspaper to cover tables       | Containers, 1/4-liter |
| Containers, 1/2-liter           | Self-stick notes      |

### SET UP THE CENTER

Cover the table with newspaper. Place a half sheet of folded newspaper and a 1/2-liter container at each student's place. Half fill a 1/4-liter container with wheat paste for each pair of students.

### GUIDE THE INVESTIGATION

- Tear the Newspaper.** Have students tear their folded sheets of newspaper into strips 2.5-cm (1") wide, then into 10-cm (4") lengths. Have them tear the entire piece of newspaper all at once.
- Begin to Papier-Mâché.** Have students
  - Place the 1/2-liter container upside down.
  - Cover the container with a thin layer of wheat paste, spreading it evenly with their fingers.
  - Lay a paper strip over the pasted bowl, and cover it with a layer of paste. Be sure to use enough paste to completely soak the paper, then wipe the excess off.
  - Follow the same procedure using a second strip of paper, *overlapping* the first strip already on the container.
  - Cover the entire outside of the container with several layers of paper strips, *down to but not over* the rim of the container.
- Ask Questions to Guide Discussion.**
  - What does the wheat paste look like?*
  - How does the wheat paste feel? How does it feel when it dries on your hands?*
  - What happens to the paper when you dip it in the paste?*
  - Is the paper easy or hard to tear when it is soaked in paste?*
- Let the Papier-Mâché Dry Overnight.** Use self-stick notes to label each student's project on the inside of the container. Place the bowls in a designated spot to dry.
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Prepare for the Next Group.** Clean the work area for the next students.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

across	over
around	papier-mâché
dry	stiff
flour	strip
layer	tear
mold	wheat paste

# CENTER INSTRUCTION CARD

## PAPER BOXES

### MATERIALS

Paper boxes  
Large sheets of newsprint or newspaper

Crayons or markers  
Transparent tape

### SET UP THE CENTER

Place all the materials in a convenient location so they will be ready for students to use as needed. Some students may prefer to work on the floor so they have more room.

### GUIDE THE INVESTIGATION

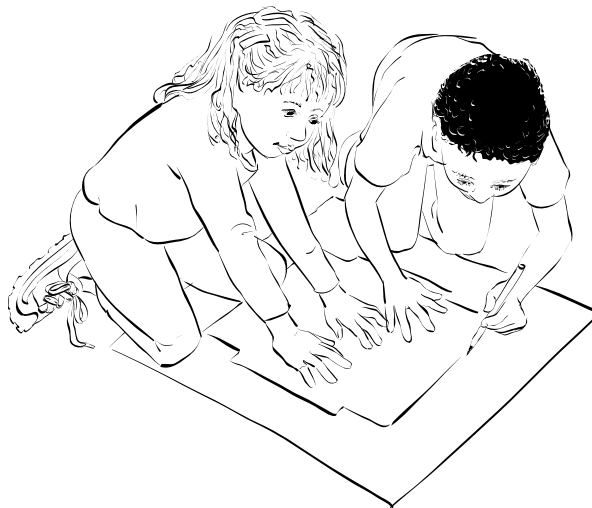
1. **Choose a Box to Take Apart.** Let students get the boxes they brought in to take apart. If a student did not bring a box, let him or her choose one from the teacher's collection.
2. **Take the Boxes Apart.** Let students begin taking the boxes apart. Some students will need help finding the seams—help them identify the places where the boxes were glued together. If the boxes get torn in places other than the seams, repair them with tape.
3. **Trace the Boxes.** When the boxes are flat, have students trace the outline on newsprint or newspaper. Students may work in pairs, one holding while the other traces.
4. **Reassemble the Boxes.** Have students fold their box back into its original shape. Provide tape to secure the flaps and seams.
5. **Ask Questions to Guide Discussion.**
  - *How can you tell where the seams are?*
  - *What is the best procedure for tracing around the box?*
  - *What is the best way to put the box back together? Do you start with the top, the bottom, or the sides?*
  - *Compare the tracing and the reassembled box. How are they alike and different?*
  - *Can you find any flaps that were glued to hold the box together or tabs that can be tucked in a slot to reclose the box once it has been opened?*
6. **Add to the Word Bank.** Add new or important words that students use to the word bank.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

bottom  
box  
edge  
outline  
overlap

seam  
shape  
side  
top  
trace



# CENTER INSTRUCTION CARD

## PAPER WEAVING

### MATERIALS

Construction-paper bases cut with five slits  
Strips of construction paper, two colors

Tape  
Glue

Scissors

### SET UP THE CENTER

Put a construction-paper base at each student's place. Put the colored strips in the center of the table within easy reach of students.

### GUIDE THE INVESTIGATION

**NOTE:** If students have had no experience with weaving, they will need to work very slowly, step-by-step. If they have had experience, you can let them go to work on their own.

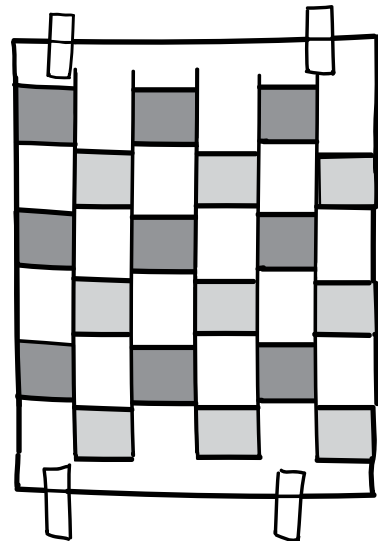
- Weave the First Strip.** Have students orient the base so the slits are going up and down. Weave the first colored strip, under, over, under, and so forth. Push the strip down to the bottom of the base. (The strips are longer than the base, so students don't accidentally pull them all the way through.)
- Weave the Second Strip.** Use the other color of strip to weave next. This time students must start the strip by weaving over, then under. (This is the difficult part, alternating the pattern.) If they make a mistake, encourage students to pull the strip out and start again.
- Continue Weaving.** Continue weaving the strips until the entire paper is covered. This should take six strips with a little room to spare.
- Ask Questions to Guide Discussion.**
  - What is the pattern you use for weaving?*
  - If you start by going under with one strip, how do you start the next strip?*
  - Does the weaving pattern you've created remind you of anything you've seen before?*
  - Could you use a different pattern to weave paper together? What would it be?*
- Add to the Word Bank.** Add new or important words that students use to the word bank.
- Finish the Edges.** Students can put a drop of glue under each strip to attach it to the base. (Be sure to have them glue both sides.) They can then trim the woven strips to the size of the base.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the activity. Try to include these words in discussions with students.

alternate  
base  
horizontal  
over  
pattern

slit  
strip  
under  
vertical  
weave



# CENTER INSTRUCTION CARD

## MAKING SCULPTURES

### MATERIALS

Variety of paper	Newspaper
Scrap pieces of wood	Craft sticks
Fabric scraps	White glue
White paper	Scissors
Pencil	Paper plates

### SET UP THE CENTER

Have all materials available at the center for students to use as needed.

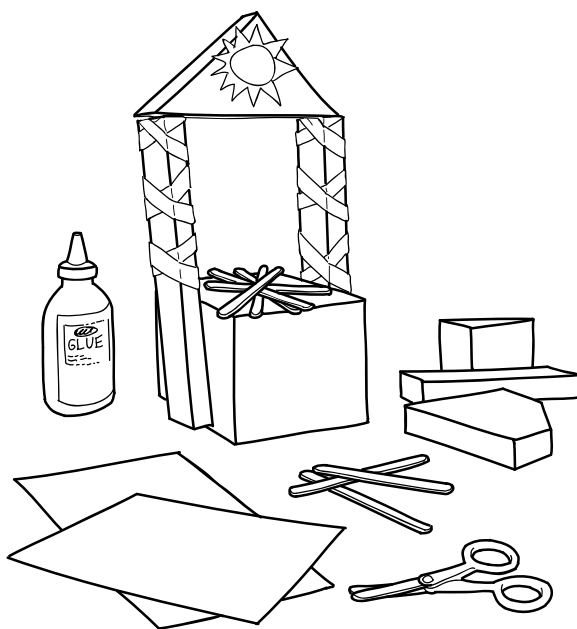
### GUIDE THE INVESTIGATION

1. **Review the Challenge.** Remind students that their job is to construct something out of wood, paper, and fabric. It can be anything they want. Show them that there are many kinds of paper, scrap wood, fabric, and craft sticks to use to make something of their choice.
2. **Begin Construction.** Let students work freely for a time before providing glue. Tell them to pile and hold pieces of wood and paper together in various ways to figure out how they would like to assemble their sculpture. Let the construction begin. If students have difficulty getting started, make some suggestions. Students may be interested in making boats, buildings, people, airplanes, masks, animals, or a free-form decorative sculpture.
3. **Label the Creations.** While students work, write each student's name and the date on a craft stick. They should include that craft stick as part of their sculpture so it can be identified later.
4. **Dry the Sculptures Overnight.** Set the sculpture in a place where it can dry overnight. Check to make sure it is labeled with the student's name.
5. **Add to the Word Bank.** Add new or important words that students use to the word bank.

### VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the activity. Try to include these words in discussions with students.

artistic  
cloth  
construction  
design  
fabric  
sculpture



# SCIENCE NOTEBOOK QUESTIONS

- Inv. 1 Part 1: Where does wood come from?
- Inv. 1 Part 2: What is made of wood?
- Inv. 1 Part 3: What happens when wood gets wet?
- Inv. 1 Part 5: How did you test the wood?  
What did you find out?
- Inv. 2 Part 1: How can you change the shape of wood?
- Inv. 2 Part 2: How are sawdust and wood shavings different?
- Inv. 2 Part 3: How did you make particleboard?
- Inv. 2 Part 4: How did you make plywood?
- Inv. 3 Part 1: What is made of paper?
- Inv. 3 Part 2: Are all papers good for drawing on?
- Inv. 3 Part 3: Are all papers easy to fold?
- Inv. 3 Part 4: What happens when paper gets wet?
- Inv. 4 Part 1: How did you make new paper from old paper?
- Inv. 4 Part 2: How did you make a bowl from old paper?
- Inv. 4 Part 3: What materials do we recycle at school?
- Inv. 4 Part 4: How does water change from a liquid  
to a solid and back again?
- Inv. 5 Part 1: How are paper boxes made?
- Inv. 5 Part 2: How did you weave paper?
- Inv. 5 Part 3: What did you make? What did you use?

# FOLDING PIRATE HATS

## EXTENSION FOR INVESTIGATION 3

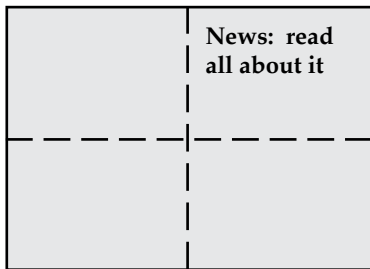
### MATERIALS

For each student  
1 or 2 Sheets of newspaper, 56 cm × 71 cm (22" × 28")

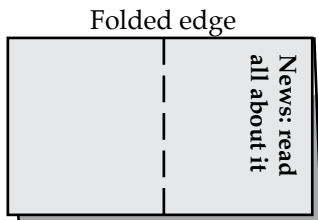
For the class  
1 Stapler

### CONSTRUCTION

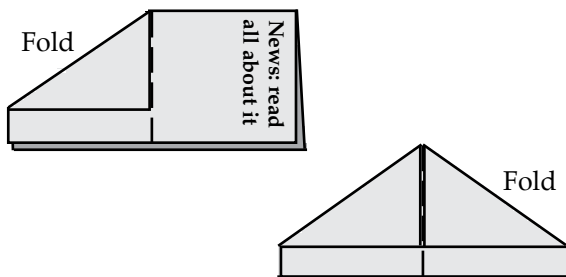
1. Lay out a full sheet of newspaper. (Using two sheets makes the hat a bit sturdier.)



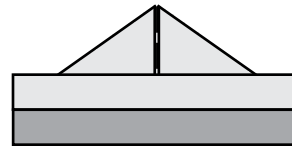
2. Fold the paper in half and rotate the folded paper 90 degrees.



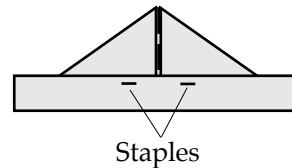
3. Fold down each of the upper corners, bringing the points to the center line.



4. Fold up the bottom edge along the line created by the corner folds completed in Step 3.

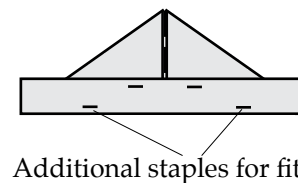


5. Flip the hat over, and fold up the other edge.



6. Staple the flaps up in one or two places to keep the hat from unfolding and falling apart. But don't staple the hat closed.

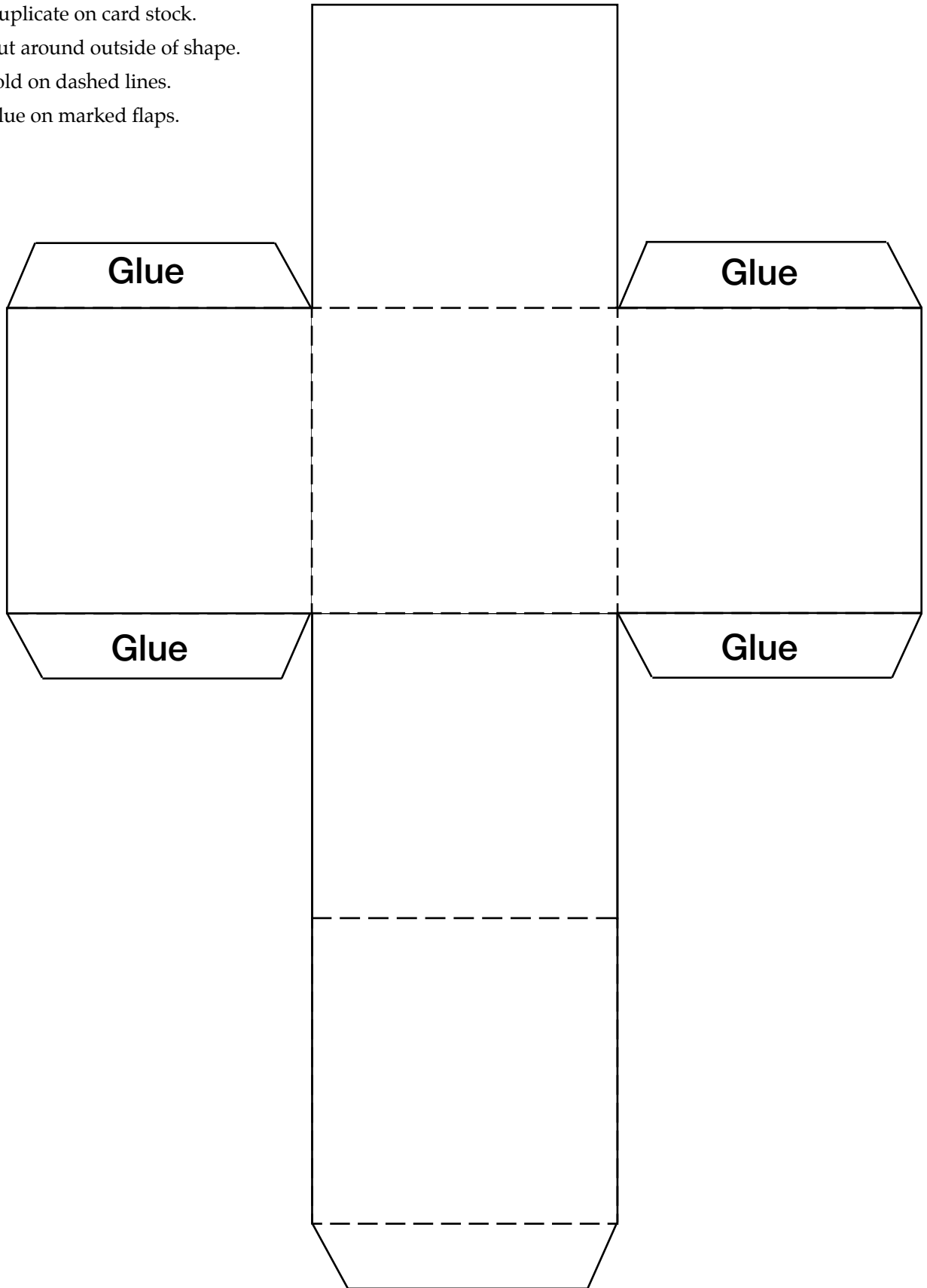
7. If the hat is too big, staple the hat together on each side, leaving enough room in the middle for the hat to fit comfortably.



# MAKE A PAPER BOX

## EXTENSION FOR INVESTIGATION 5

- Duplicate on card stock.
- Cut around outside of shape.
- Fold on dashed lines.
- Glue on marked flaps.



# HOME/SCHOOL CONNECTION

## INVESTIGATION 1: GETTING TO KNOW WOOD

At school, we took a close look at five different kinds of wood to discover all the ways they were alike and different. Students got to know them so well that they went on a hunt in the room, searching for a wood sample that matched their own. Along the way, they discovered many things that are made from wood. Here are two ways to practice the vocabulary and observation skills your child is developing.

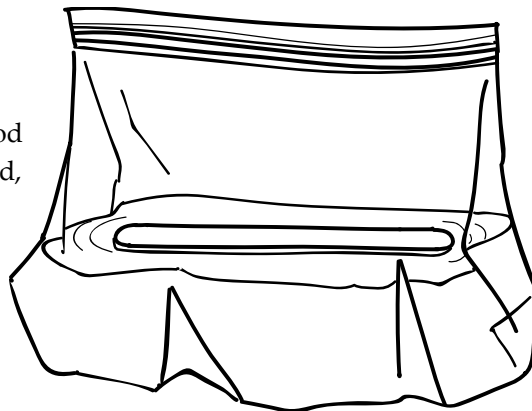
- Play “I’m thinking of something that is made of wood and it is (round, big, painted, flat...)” Take turns describing and identifying wood in use around your home or out in the neighborhood.
- Have your child search for four different ways wood is used around your home or neighborhood. Have him or her draw and label the four uses using the labels below.


This is made of <b>wood.</b>	This is made of <b>wood.</b>
This is made of <b>wood.</b>	This is made of <b>wood.</b>

# HOME/SCHOOL CONNECTION

## INVESTIGATION 2: CHANGING WOOD

We have been investigating what happens when water and wood come together. We've dropped water on different kinds of wood, floated wood, and sunk wood. One discovery we made was that tiny pieces of wood can become waterlogged. We are wondering if larger pieces of wood will become waterlogged, too. Here is one way to find out.



### MATERIALS

- 2 Craft sticks
- 1 Plastic zip bag or bowl
- Water

### INVESTIGATION

1. Fill a zip bag or bowl about one-third full of water.
2. Float the craft stick in the water. Leave the bowl or bag out where you can see it. If you have a bulletin board, the zip bag can be tacked to it.
3. See how long the stick takes to become waterlogged. Ask your child how he or she will know if it is waterlogged. (It will sink to the bottom. This might happen as quickly as overnight or take a week or more.)

# HOME/SCHOOL CONNECTION

## INVESTIGATION 3: GETTING TO KNOW PAPER

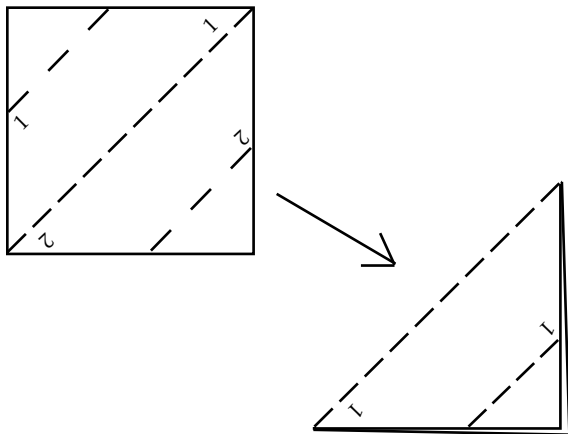
At school, we have begun to investigate the properties of paper. Recently, we compared how easily different kinds of paper can be folded. Not all are alike! Here is a paper-folding project you can do together. If you have more than one kind of paper available, it would be interesting to make a cup from both papers and compare the two.

### MATERIALS

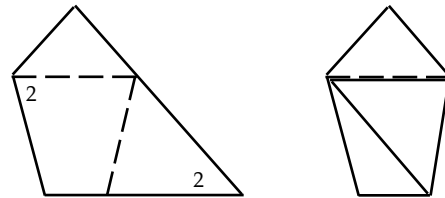
- 1 Drinking-cup pattern
- 1 Scissors (optional)

### CONSTRUCTION

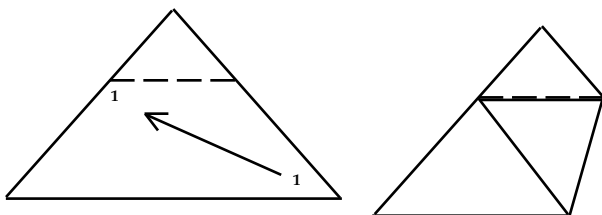
1. Cut the top off the pattern sheet.
2. Fold the sheet on the middle line that runs from corner to corner. The other lines should be on the outside, not folded in.



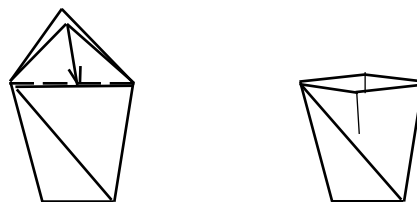
5. Flip the folded paper over, and follow the same procedure, this time matching the 2s.



3. Lay the sheet on the table, so that the long side is closest to you and the number 1s are showing.
4. Fold the number 1 on the long side up to the number 1 in the middle of the other side. Fold so the edge of the paper is parallel to the small dotted line.



6. Separate the two triangle flaps at the top of the cup. Tuck one into each of the pockets formed by the previous two folds. Open the cup, fill it with water, and drink up!



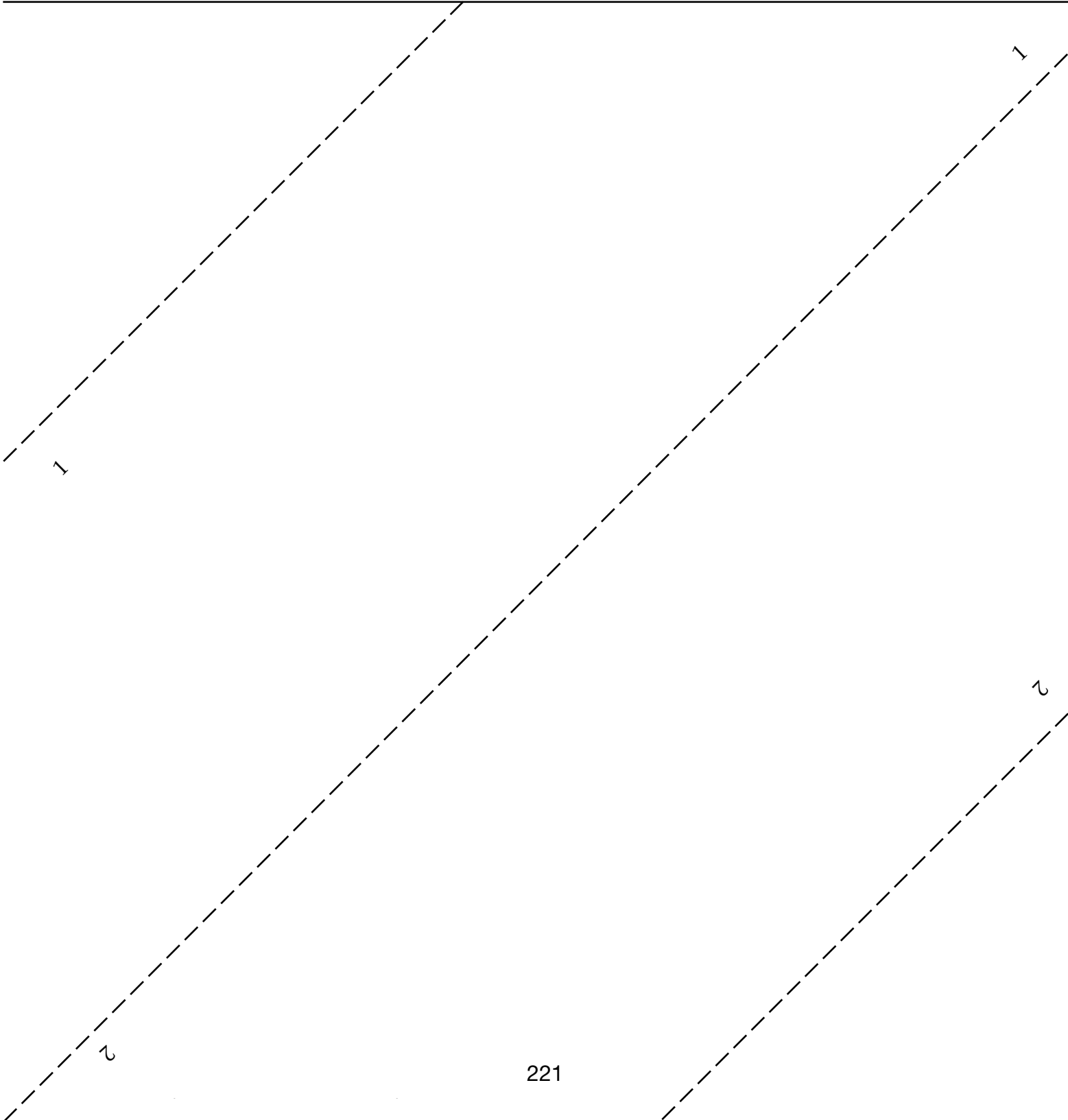
# HOME/SCHOOL CONNECTION

## DRINKING-CUP PATTERN

FOSS Wood and Paper Module  
© The Regents of the University of California  
Can be duplicated for classroom or workshop use.

Investigation 3: Getting to Know Paper  
No. 25—Teacher Sheet

Cut on this line.



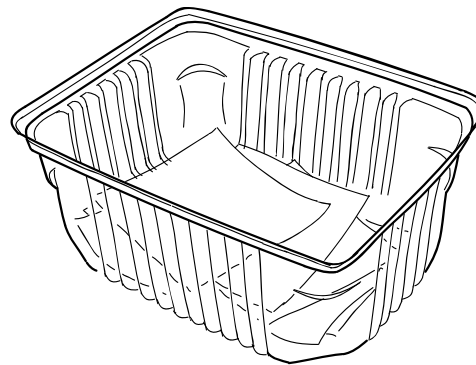
# HOME/SCHOOL CONNECTION A

## INVESTIGATION 4: CHANGING PAPER

Making a collage of all kinds of paper is a fun way to explore and compare the many properties different papers have. Your child will get the most from this activity if he or she has collected a wide variety of paper. Crepe paper, tissue, wallpaper, wrapping paper, and cardboard are all good choices. Little scraps are all that is needed, but take the time to gather an interesting collection.

### MATERIALS

- Paper to use as a base (Construction paper works best.)
- Variety of paper scraps
- Glue
- Scissors
- Stapler (optional)



### CONSTRUCTION

1. Cut a paper square to be used as a base for the collage. Experiment a bit together with different ways of using the paper scraps you have collected. Try tearing the paper; not all paper tears the same. Try curling different kinds of paper. There are many ways to bend or fold paper; accordion-folded paper makes nice pop-out effects. Sprinkle water on paper to see the effect; crepe paper has an especially interesting reaction to water drops.
2. Once the exploration process has sparked ideas, let your child begin making a collage, and provide little guidance. Encourage him or her to cover the entire paper base. Here are some questions to guide discoveries.
  - *Are all of the pieces of paper easy to cut or tear? Which are more difficult and why?*
  - *How many different kinds of paper are on your collage?*

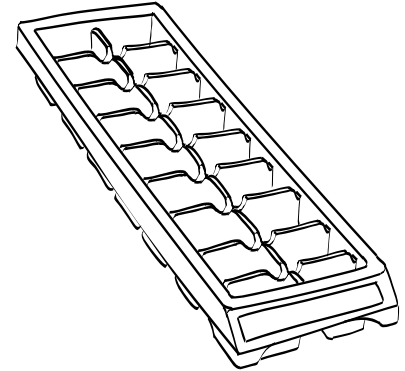
### REMINDER

We will be making sculptures using paper and wood soon and could use any leftover scraps of interesting paper. We would appreciate any contributions for our collection. Thanks.

# HOME/SCHOOL CONNECTION B

## INVESTIGATION 4: CHANGING PAPER

Students have put cups of water and plastic bags of water in a freezer overnight to observe that water can be a liquid or solid and changes back and forth from one form to another. You can provide more experiences with freezing and melting water at home. Your child could take the water out of the freezer as it is turning to a solid and observe how the ice forms. As an alternative to freezing water, you could freeze fruit juice in clean containers so your child can drink it after it melts.



### MATERIALS

- Ice-cube tray
- Plastic containers of various kinds
- Freezer
- Water or fruit juice

### INVESTIGATION

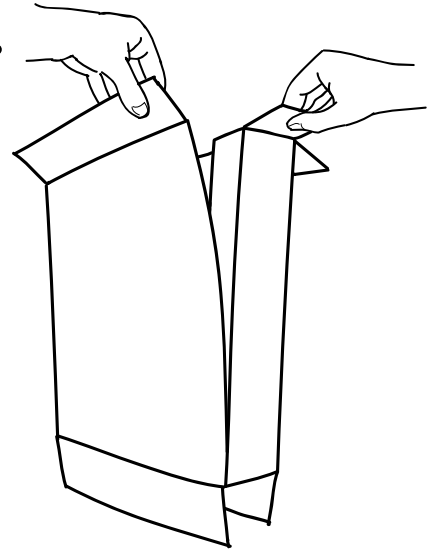
1. Have your child put water and/or fruit juice in an ice-cube tray or in other plastic or metal containers. Do not use glass for safety reasons.
2. Put the container of liquid in the freezer.
3. Remove it after an hour and see what is happening. Then put it back in the freezer.
4. The next day, remove the container and observe. Leave the container at room temperature and see how long it takes to melt.

# HOME/SCHOOL CONNECTION

## INVESTIGATION 5: CONSTRUCTIONS

Now that we know about the properties of wood and paper, we've been exploring how those properties are useful when it comes to making things. Here are two ways to continue the investigating at home.

- Take apart boxes and put them back together. Before tossing out an empty box of any kind, pass it over to your scientist-son or -daughter. Let your child carefully take it apart at the seams and unfold it to discover the interesting shapes that packaging can take. Provide a little tape, and let your scientist reassemble it. Cardboard tubes are also interesting to disassemble.
- Make an envelope that can be sent to someone in the family. Here's how.



### MATERIALS

Envelope pattern	Sticker or stamp (optional)
Scissors	Roll of transparent tape
Writing paper	Scrap paper, 3" x 5"
Glue or glue stick	
Crayons, pencils, or markers	

### CONSTRUCTION

1. Have your student cut out the envelope pattern, cutting on the *solid lines only*.
2. Turn the pattern face down. Carefully fold the flaps on the dashed lines. Fold flap number 1 first, then flaps 2, 3, and 4.
3. Lay a piece of scrap paper inside the envelope. Put glue on the areas labeled "glue." Glue the envelope together. Take the scrap paper out.
4. Get a paper and pencil to write (draw) a letter to someone in the family. Once the letter is written, the challenge is to fold it to fit inside the envelope. Seal the envelope with transparent tape. Help your child address it, stamp it, and send it off.
5. Take apart other envelopes to see if they are made the same way.

# HOME/SCHOOL CONNECTION

## ENVELOPE PATTERN

