

The Wonderful World of Water

Standard III

Students will gain an understanding of Physical Science through the study of the forces of motion and the properties of materials.

Objective 2

Analyze objects and record their properties.

Intended Learning Outcomes

Generating Evidence: Using the processes of scientific investigation (i.e. framing questions, designing investigations, conducting investigations, collecting data, drawing conclusions)

Communicating Science: Communicating effectively using science language and reasoning.

Background Information

Students will need to understand the unique properties of water as illustrated in the *The Comprehensive Water Education Book*. First grade students need a basic understanding of the three states of water. Water as a gas will be covered only briefly. Students will need exposure to and experience with all forms of water.

The Water Cycle is not included in the first grade Core Curriculum. Teaching briefly about the water cycle is necessary for students to understand how water is received. Water is all around us and is almost always in motion. The provided activities will engage students' learning about water. Students will be involved in measuring, predicting, comparing, observing, and describing throughout the series of lessons.

Teachers should be familiar with the unique properties of water, the three states of water, examples of water in each state, and the water cycle prior to teaching these activities.

Research Basis

Colburn, A. (2004). Inquiring scientists want to know. *Educational Leadership*, September 2004, Page 63-66.

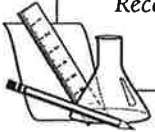
Learning to think independently and scientifically is a worthy instructional goal. Learning to think independently means that students must actually think independently. Critical thinking is a complex skill that requires instruction, practice, and feedback. Thinking is not a context-free activity. To gain a deep understanding of scientific concepts, learners must actively grapple with the content. Teachers must choose activities that match students' background knowledge and reasoning skills.

Gabbert, B., Johnson, D.w., Johnson, R.T. (2001). Cooperative learning, group-to-individual transfer, process gain, and the acquisition of cognitive reasoning strategies. *The Journal of psychology*, Volume 120 (Issue 3), Page 265-278.

This article states that students in a cooperative learning situation tend to use higher level reasoning strategies than students completing the same task individually. Results also indicated that group-to-individual transfer did take place within cooperative learning groups and that process gain tended to occur.

Materials

- Our Day Chart
- Our Day
- Water Story Page
- Puddle Shaped Chart
- Chart Markers
- 3-prong folder (1 each)
- Teacher's Way/My Way Recording Forms



Invitation to Learn

1. Work through the chart as a whole class while individual students complete their personal Our Day sheets.
2. Water is the word of the day.
3. Talk with the students about the Water Story Page, and have students complete it.
4. As students share from their water pages, write their responses on the puddle shaped chart. This chart will serve as a pre-assessment.
5. Have students decorate a folder containing one Teacher's Way/My Way Recording Sheet for each activity.

Instructional Procedures

Let's Learn About Water

Materials

- I Am Water
- Water as a Liquid Chart (Water Glass)
- Water as a Solid Chart (Snowman)
- Water as a Solid Chart (Cloud)
- Chart Markers
- I Am Water word strips
- Teacher's Way/My Way Recording Form



1. Before reading the story, introduce students to the phrases water as a liquid (water that is coming out of the faucet or drinking fountain, when it rains, running in a river, etc.), water as a solid (ice, snow, frost, ice cubes, icicles, and ice on a skating rink), and water as a gas (water that has changed into steam). Water as a gas is difficult to understand. Ask the students to hold a hand in front of their mouth and breathe slowly into the palm. The students will be able to feel wetness on their palm. We breathe out water as a gas. Animals breathe out water as a gas. Hand out word strips with examples of each water state. Allow discussion between students to find the correct state of water. Students will attach the word strip to the appropriate chart.
2. Read *I Am Water*. Check to see that each word strip was placed appropriately and discuss the differences in the three states of water. Play Be a Water Molecule. Students that are ice will be grouped closely together. Students that are water will have small amounts of room between them. Students that are water vapor will be able to freely move about.
3. Have students open to the first *Teacher's Way/My Way Recording Form*. On the Teacher's Way portion of the worksheet, the

students will write, "Water can be liquid that we drink, solid that is like snow, and vapor that we breathe out." On the My Way portion, students will draw pictures to help them remember the things that they learned.

Assessment Suggestions

- Pre-assess the students' knowledge of the states of water by having them place the word strips on the appropriate water form.
- Assess student understanding after reading the book by allowing students to move any word strips placed incorrectly.

Water Is Popular

1. Review the charts with the students. Have the students help fill in the choices on the School Interview Graph Worksheet. Divide students into groups to conduct interviews throughout the school. Each group will interview 12 people.
2. When the groups return to class, compare the graphs or build a large class graph. Ask graphing questions such as, "which way is water used the most?" "Which way is water used the least?" "Are any of the uses equal to each other?"
4. Have students turn to the next *Teacher's Way/My Way Recording Form*. On the Teacher's Way side, students copy, "We use water for many different things. At our school, the most popular way to use water is _____." On the My Way side, students will use illustrations to make a connection to what was learned.
3. Give students time to decorate the front of their *Favorite Water Activities Homework Booklet*. Students will have one week in which their families will help them complete the book. Returned books will be shared and compared.

The Great Meltdown - Investigating Water as a Solid

1. Review the types of water as a solid from the Snowman Chart. Ask if there are any other types the students would like to add.
2. Read the Snow book.
3. Give each student an ice cube. Ask for describing words, how does the ice cube feel, what shape is it, anything else that you notice? Do you notice that the ice cube is melting? What causes ice to melt? How could we stop the ice from melting?

Materials

- Charts from the previous day
- Favorite Water Activities Homework Sheets*
- School Interview Graph...*
- Teacher's Way/My Way Recording Forms*

Materials

- Snow
- 5 ice cubes per group
- Extra ice cubes (one each)
- The Great Meltdown
- Sand (one TBSP per group)
- Salt (one TBSP per group)
- Snowman Chart
- Teacher's Way/My Way Recording Forms*

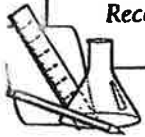
4. Divide the students into groups. Give each group *The Great Meltdown Worksheet*, five ice cubes in a cup, one TBSP of sand labeled as sand, and one TBSP of salt labeled as salt. Groups will need to brainstorm three additional ways to melt the ice cube. Groups should list their ideas in each of the 3 blank spaces. Each group member will have one ice cube to melt using one of the methods listed on the worksheet.
5. "Ready, Set, Go!" As each ice cube melts completely into water, the student yells out, "MELTDOWN!" The group will record on the worksheet which ice cube melted first, second, third, fourth, and fifth.
6. Which method is the most effective for melting ice? Which method is the least effective?
7. Have students open to the next *Teacher's Way/My Way Worksheet*. On the teacher's side, students will copy, "There are many ways to make water as a solid melt into water." On the my side, students will draw a picture to illustrate what happened during *The Great Meltdown*.

Constant Motion

1. Show the students the jar of water. Ask, "Is the water moving?"
2. Talk about how you could tell if the water was moving. What are some examples of moving water? How does water get from one place to another? Is all water movement noticeable? Does man create some water movement? Stress to the students that most water we receive and use is because man has engineered a way for gravity to move water to desirable locations. Drinking fountains, bathtubs, and sinks all of these allow us to receive water.
3. Hand out the *Rainbow in a Jar* worksheet. Instruct students to take out red, yellow, and blue crayons. Students will color their worksheet to match what is happening in the jar.
4. Prepare for the demonstration by using hot water to improve the liquid movement. Place a few drops of red food coloring into the jar. As you wait, ask students to predict what will happen. The teacher may need to lead the prediction by asking the following questions: will the food coloring stay in one place? Will the food coloring drop straight down to the bottom? Will the food coloring swirl throughout the jar? Once the red food coloring begins to swirl throughout the water, instruct the students to color their worksheet.

Materials

- Snowman and Water Glass charts
- Rainbow in a Jar*
- Clear quart size jar
- Hot water
- Red, yellow, and blue liquid food coloring
- Red, yellow and blue crayon for each student
- Teacher's Way/My Way Recording Forms*



5. Add a few drops of blue food coloring next to but not directly on the red food coloring. Ask students to predict what will happen. Use the questioning techniques if necessary. When the blue starts to swirl in, instruct the students to color their worksheet.
6. Add a few drops of yellow food coloring in a different spot in the jar. Go through the process of predicting, observing, and recording. Talk to the students about water movement. The teacher will be able to complete a quick informal assessment of student understanding by listening to responses as the yellow food coloring is added to the jar.
7. Have students open to the next *Teacher's Way/My Way Recording Form*. On the Teacher's Way portion, students will copy, "Water is almost always moving." On the My Way portion, students will draw a representation of the *Rainbow in a Jar* activity.

Hey, It's The Water Cycle!

1. Introduce the Water Cycle representation. Hand out all word strips *except* evaporation, condensation, and precipitation. Have the students attach the word strips to the representation. Allow for group discussion as necessary for correct placement of word strips.
2. Teach the Water Cycle Song with actions.

Water Cycle Song

(to the tune of She'll be Coming 'Round the Mountain)

Water travels in a cycle, yes it does.

Water travels in a cycle, yes it does. (Hands go around in a circle).

It goes up as evaporation (Hands go straight up),

Forms clouds of condensation (Clap hands together),

Falls down as precipitation (Bring hands down wiggling fingers imitating a rainstorm), yes it does!

Emphasize the words evaporation, condensation, and precipitation. Sing the song with the students. Ask if anyone knows, based on the actions of the song where the evaporation word card should be placed on the Water Cycle. Repeat the song with actions as needed. Repeat the questioning for placement of the condensation and precipitation cards. When all of the cards are in place, have the students point out the words as they sing.



Materials

- Large representation of the Water Cycle
- Word strips (evaporation, condensation, precipitation, rain, snow, clouds, river, lake, and any others that match the representation you are using)
- The "Water Cycle Song" on chart paper
- Sponge and water
- Chalkboard
- Paper and pencil
- Clear plastic cups
- Hot water
- Rain or The Magic School Bus Wet All Over: A Book About the Water Cycle*
- Teacher's Way/My Way Recording Forms*

3. What are the natural ways that we receive water? Review the representation as necessary for students to answer, "Rain, snow, sleet, hail, run-off from the mountains, rivers, lakes, oceans, etc."
4. What is evaporation? Play "Evaporation." Each student will need a paper and a pencil. Write a spelling word or number on the chalkboard with the wet sponge. Have the students observe the water "disappearing" into the air. Explain that the water hasn't disappeared, it has evaporated into the air. Write another spelling word or number on the chalkboard. Have the students write that word or number as many times as they can until it has evaporated off the chalkboard. When complete evaporation has occurred, yell out, "Evaporation!" Repeat with a new word or number.
5. Divide students into groups. Give each group two cups - test the cups prior to this activity to make sure they won't melt. Tell the students that they are going to create their own Water Cycle. You will pour hot water into one of the cups. The other cup will be placed upside down on top of that cup. Remind the students to be very careful with the hot water. You may need an adult helper for each group. The students will be able to observe the steam from the hot water condense onto the bottom of the other cup. Then, as the water condenses, it will drip down like a rainstorm. Following this activity, allow time for questions and discussion.
6. Read the *Rain* book or *The Magic School Bus Wet All Over* book
7. Have students open to the next *Teacher's Way/My Way Recording Form*. On the Teacher's Way side, students will copy, "The Water Cycle is one way we receive water. Evaporation is when the water goes into the air. Condensation is when the water sticks together like in a cloud. Precipitation is when the water falls back to the earth like rain or snow." On the My Way side, student's should draw their own representation of the Water Cycle.

Materials

- Water
- Sink or Float Kit (1 per group) (1 peanut in a shell, 1 paperclip, 1 rock, 1 marble, 1 plastic boat, 1 small wood block, 1 sponge, 1 chunk of clay, and 1 seashell in a plastic shoebox with a lid)
- Sink/Float Recording Sheet
- Who Sank the Boat
- Teacher's Way/My Way Recording Forms
- Sink/Float Take Home Pack

Sink or Float?

1. Divide students into groups. Hand out a *Sink or Float Recording Sheet* to each group. If necessary, discuss basic rules with the class - taking turns, waiting politely, talking things out, making a best guess, etc.
2. Show the students each of the objects from the kit. Tell them that within their group they need to predict (make a best guess) if each object will sink or float when placed in water. Each group needs a Recorder to record the predictions, a Materials Manager



to remove the objects from the box, a Tester to put the objects into the water, a Removal Specialist to take the objects out of the water, and a Professor to record the actual results of the test. Depending on the group of students, it may be beneficial to create job tags for the students to wear during this activity.

3. Hand out the Sink or Float Kits - one to each group. Instruct the Materials Manager to remove the objects one at a time, allowing each student in the group to hold the object and give input before the prediction is recorded by the Recorder. After a prediction is made, the item is set aside, and the Materials Manager removes the next object from the box.
4. After all predictions are made within the group, the Materials Manager will come to the teacher to request water. The teacher will check to see that predictions have been made, see that the recording sheet has been handed off to the Professor, and pour water into the box.
5. The Tester will *carefully* place an object in the water. Does the object sink or float? The Professor should record the actual finding on the *Sink or Float Recording Sheet*. The Removal Specialist *carefully* removes the object from the water and places it in the lid of the box. This process continues until all objects have been tested.
6. When all groups have completed the activity, discuss the class results. Were any of the group results different from another? Is there any way to alter the results?
7. Have the Materials Manager divide the clay into pieces - one piece for each student in the group. Allow the students time to shape the clay and find a shape that will float. Listen to the students talk through the process of shaping the clay.
8. Read *Who Sank the Boat*.
9. Have the Tester return the boat to the water. Allow groups to choose objects to put in the boat until the boat sinks. Give the students discussion time to compare results between groups.
10. After allowing time for exploration and discussion, the group will carefully bring the objects to a side table. The teacher or adult helper will gather the boxes of water. All objects should be dried completely before storage.
11. Have the students open to the next *Teacher's Way/My Way Recording Form*. On the Teacher's Way side, students copy, "Things that are heavier than water sink. Things that are lighter than water float." On the My Way side, students will draw a picture of the sink or float activity.

1st 3-2 3:7

12. Students will have turns to explore the *Lakeshore Sink/Float Take Home Pack* in a center or individually as a homework activity or home connection.

Materials

- The Most Important Thing Story pages*
- glass of water, snowman, cloud and puddle charts
- I Am Water*
- Water Cycle representation
- "Water Cycle Song" on chart paper
- Smiley-face stickers (one each)
- Teacher's Way/My Way Recording Forms*

The Most Important Thing

1. Read *I Am Water*. Review the forms of water charts. Add any new findings.
2. Sing the Water Cycle Song. Review evaporation, condensation, precipitation. How do we receive water? Do we always receive water from precipitation? What are some man-made ways that we receive water?
3. Ask students to review their *Teacher's Way/My Way Recording Forms*.
4. Give each student a *Most Important Thing Story Page* and a smiley face sticker. Instruct students to use the smiley face as their own face, drawing themselves enjoying water in the illustration spot on the story page.
5. As the students are drawing and coloring their illustrations, work with small groups to fill in the story page.
6. Allow all students to complete the activity and to share their story page.
7. Gather the pages to be bound into a class book.
8. Review the responses from the Puddle chart. What other ways do we use water? Record student responses. Use the additional responses as a final assessment.

Assessment Suggestions

- Record student water uses from *Water Story Page* on the puddle chart - use as a pre-assessment to determine the amount of time necessary to spend on each state of water.
- Revisit the puddle chart at the conclusion of the activities to add and correct water uses.

Curriculum Extensions/Adaptations/Integration

- Advanced learners may enjoy playing "Evaporation" with number sentences.
- Special needs students may need to be paired with another student to complete the independent activities.

- ESL students may need additional time for exploration and learning of vocabulary.
- Students may enjoy creating a flip book titled "Water." The first flap will say "water as a liquid." The second flap will say "water as a solid." The last flap will say "water as a gas." On the pages the students will draw a picture to illustrate each form of water.
- Advanced learners or students with an interest in drama may enjoy participating in this readers' theater. <http://www.enchantedlearning.com/rt/weather/watercycle.shtml>

Family Connections

- *Favorite Water Activities Homework Sheets* stapled into booklets to be completed at home and shared at school.
- The *Sink/Float Take Home Pack* may be taken home by each student for the activities to be completed as a family.

Additional Resources

Books

I Am Water, by Jean Marzollo; ISBN 0590265873

Snow, by Marion Dane Bauer; ISBN 0689854374

Rain, by Marion Dane Bauer; ISBN 068954390

Who Sank the Boat, by Pamela Allen, ISBN 069811373X

The Magic School Bus Wet All Over: A Book About the Water Cycle, by Pat Relf, ISBN 0590508334

Web sites

<http://ga.water.usgs.gov/edu>

<http://www.epa.gov/kids/water.htm>

http://kidshealth.org/kid/stay_healthy/food/water.html

<http://www.epa.gov/region07/kids/wtrcycle.htm>

<http://www.kidzone.ws/water/>

Additional Media

Lakeshore Sink/Float Take Home Pack, (Lakeshore Learning Materials, <http://www.lakeshorelearning.com>); Item #RR805

1st 3-2 3.9

Our Day

Today is _____, day _____

hundreds	tens	ones

Another way to write this number is _____

The date is _____

The short date is _____

Our word of the day is _____

Our lunch choices are _____

or _____

something new we learned or _____

Something great that happened today _____

Our Day

Today is _____, day _____

hundreds	tens	ones

Another way to write this number is _____

The date is _____

The short date is _____

Our word of the day is _____

Our lunch choices are _____

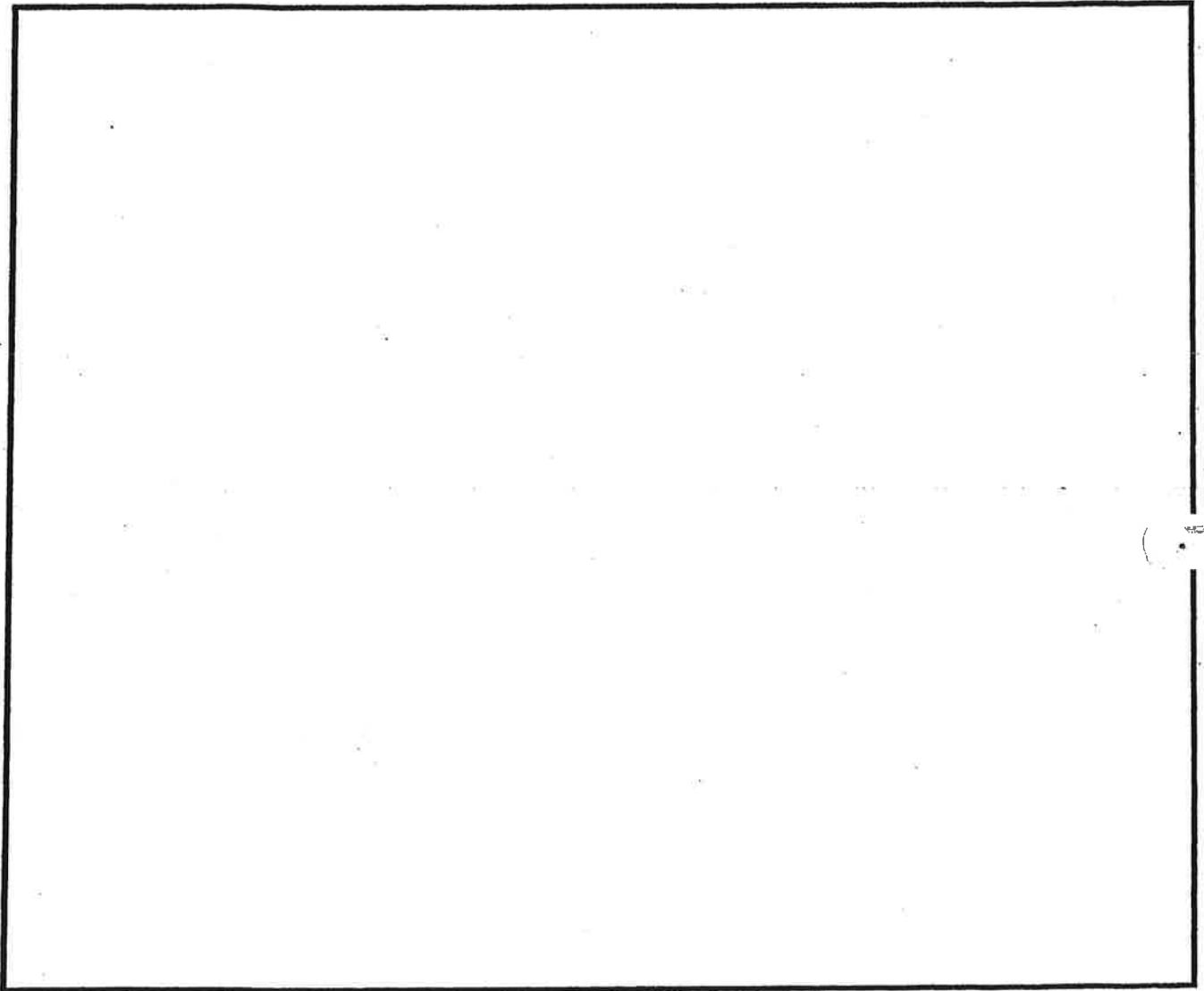
or _____

something new we learned or _____

Something great that happened today _____

Water Story Page

Water can be used in many different ways.

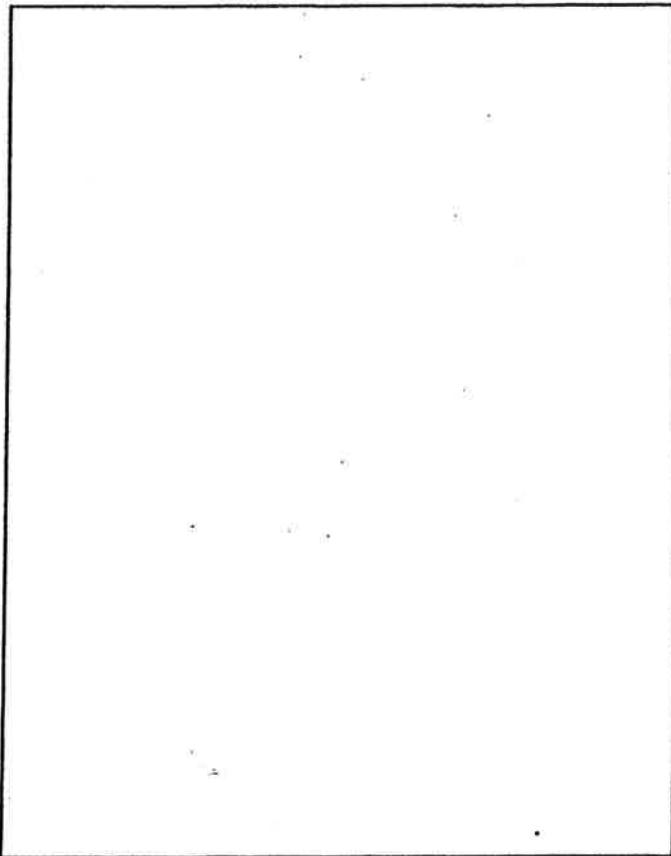


I like to use water for

By: _____

Favorite Water Activities Homework Booklet

This is my

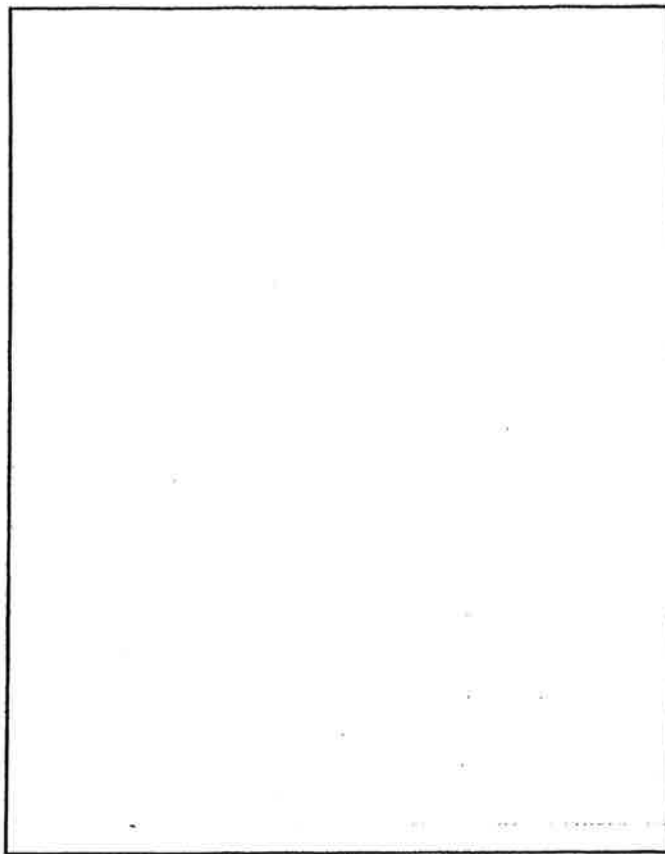


My _____ **uses**

ter for _____.

Favorite Water Activities Homework Booklet

This is my



My _____ **uses**

water for _____.

School Interview Graph Worksheet

	1	2	3	4	5	6	7	8	9	10

Which way is water used the most? _____

Which way is water used the least? _____

Class Results: Most popular use: _____

Least popular use: _____

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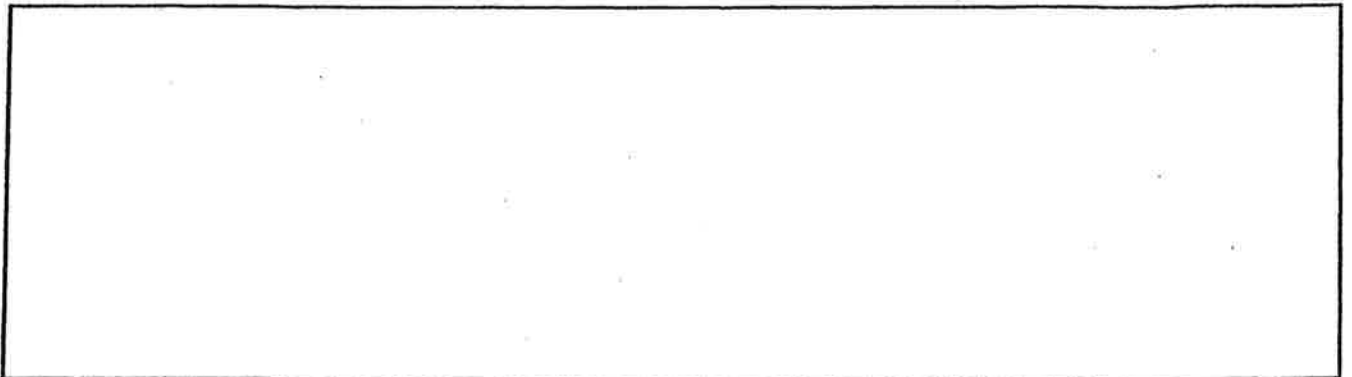
The Great Meltdown

sand	
salt	

Which is the most effective way to melt ice? _____

Which is the least effective way to melt ice? _____

Draw a picture of the ice cube that melted the fastest:

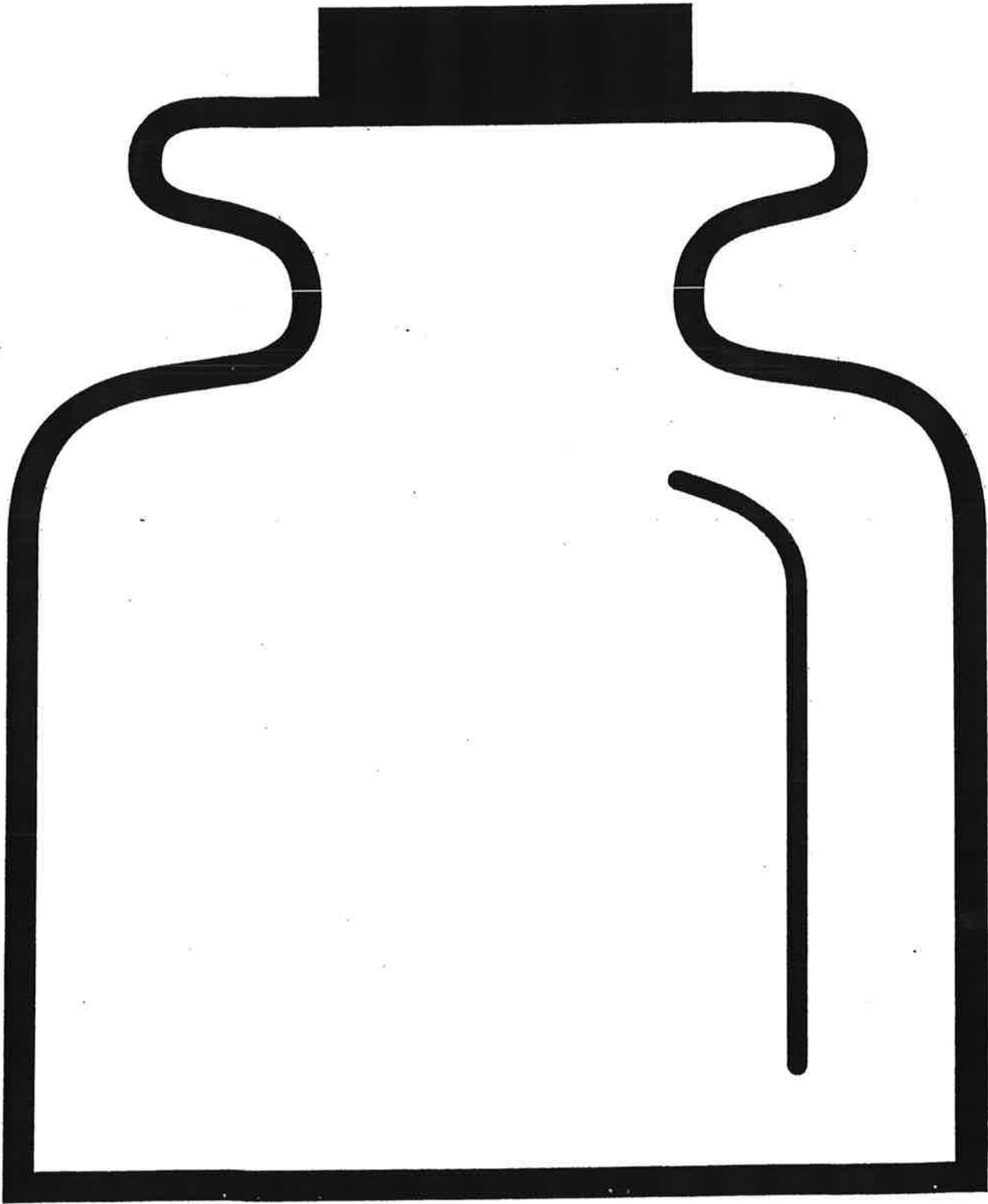


Write 3 describing words: Ice feels _____,

, and _____.

1st 3-2 3.15

Rainbow in a Jar



1st 3-2 3.1b

Name _____

Sink or Float Recording Sheet

	Prediction		Actual Test	
	Sink	Float	Sink	Float
peanut				
paper clip				
rock				
marble				
boat				
block				
sponge				
clay				
seashell				

How can you change the results?

How can you sink the boat?

What did you learn?

1st 3-2 3.17

The Most Important Story

The most important thing about water is that water is always moving.
Water can be solid like ice or liquid like we drink.
Water can be used in many ways.

I use water for

But most important thing about water is that water is always moving.
Water can be solid like ice or liquid like we drink.
Water can be used in many ways.

1st 3-2 3.18