WATER ON SURFACES

Draw and describe what you observed when you put water on these surfaces.

WAX PAPER

PAPER TOWEL

ALUMINUM FOIL

WHITE PAPER

WATER ON SURFACES

Draw and describe what you observed when you put water on these surfaces.

WAX PAPER

PAPER TOWEL

ALUMINUM FOIL

WHITE PAPER

FOSS Water Module
Investigation 1: Water Observations
No. 2—Student Sheet
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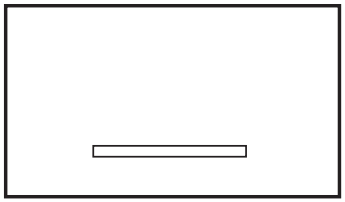
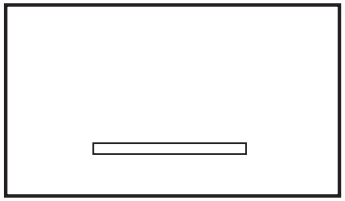
SURFACE TENSION

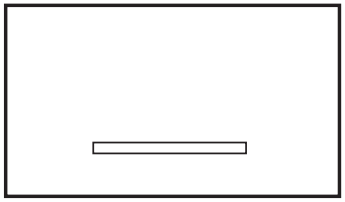
Draw and describe the shape of the water on the penny.



PLAIN WATER



SOAPY WATER

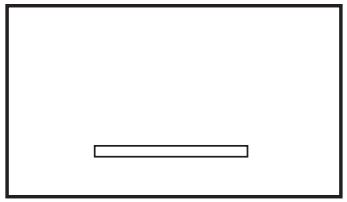


SALTY WATER

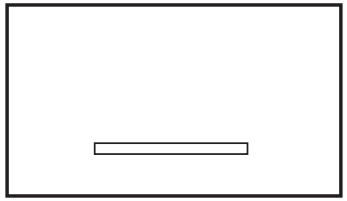
Describe surface tension in your own words.

SURFACE TENSION

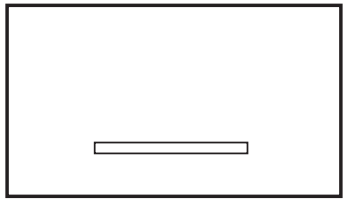
Draw and describe the shape of the water on the penny.



PLAIN WATER



SOAPY WATER



SALTY WATER

Describe surface tension in your own words.

FOSS Water Module
Investigation 1: Water Observations
No. 3—Student Sheet
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WATER ON A SLOPE

Describe what you observed when you placed water drops on a slope.

Which drops were the winners in your water races?

WATER ON A SLOPE

Describe what you observed when you placed water drops on a slope.

Which drops were the winners in your water races?

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Investigation 1: Water Observations
No. 4—Student Sheet

RESPONSE SHEET—WATER OBSERVATIONS

A student took a weekend camping trip to the mountains with her family. When it was time to put up the tent, her family couldn't agree on where to put it—at the top of the slope near some trees or at the bottom of the slope near a stream. Her older brother had heard that there might be a rainstorm that evening. The family finally agreed to put the tent near the creek so they could be closer to the water.

That evening there was a rainstorm. The student wrote this in her journal.

It really rained hard last night! We ended up getting flooded out of our tent and spent the night in the car. The water didn't come from the stream though. The stream didn't get high enough to reach our tent. Maybe we should have camped at the top of the slope!

Write a note to this student. Explain any ideas you have about why the tent flooded and about what her family should think about next time they decide where to pitch their tent.

RESPONSE SHEET—WATER OBSERVATIONS

A student took a weekend camping trip to the mountains with her family. When it was time to put up the tent, her family couldn't agree on where to put it—at the top of the slope near some trees or at the bottom of the slope near a stream. Her older brother had heard that there might be a rainstorm that evening. The family finally agreed to put the tent near the creek so they could be closer to the water.

That evening there was a rainstorm. The student wrote this in her journal.

It really rained hard last night! We ended up getting flooded out of our tent and spent the night in the car. The water didn't come from the stream though. The stream didn't get high enough to reach our tent. Maybe we should have camped at the top of the slope!

Write a note to this student. Explain any ideas you have about why the tent flooded and about what her family should think about next time they decide where to pitch their tent.

FOSS Water Module
Investigation 1: Water Observations
No. 5—Student Sheet
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BUILD A THERMOMETER

What happened when you put the bottle-and-straw setup in a cup of hot water?

- Record what you observed on the "Hot water" picture below.
- Describe what you observed.

What happened when you put the bottle-and-straw setup in a cup of ice water?

- Record what you observed on the "Cold water" picture below.
- Describe what you observed.

What could you do to make the straw thermometer more useful?

Hot water

Cold water

BUILD A THERMOMETER

What happened when you put the bottle-and-straw setup in a cup of hot water?

- Record what you observed on the “Hot water” picture below.
- Describe what you observed.

What happened when you put the bottle-and-straw setup in a cup of ice water?

- Record what you observed on the “Cold water” picture below.
- Describe what you observed.

What could you do to make the straw thermometer more useful?

Hot water

Cold water

FOSS Water Module
Investigation 2: Hot Water, Cold Water
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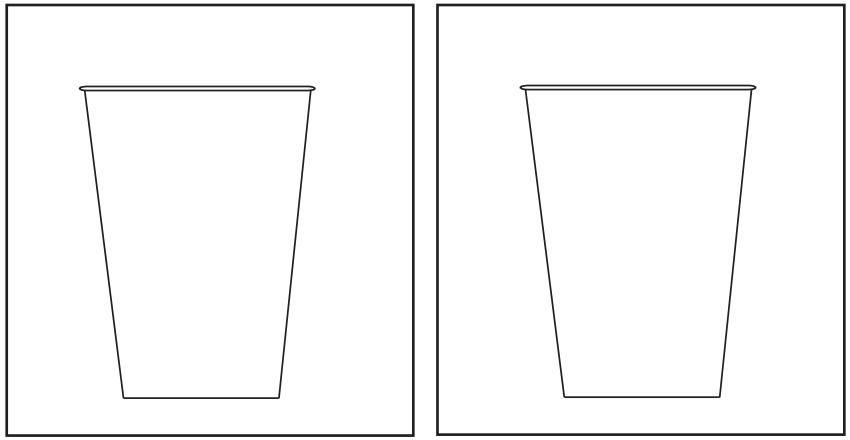
SINKING AND FLOATING WATER

Draw a picture of what happened when you lowered **hot** water into a cup of room-temperature water.

Draw a picture of what happened when you lowered **cold** water into a cup of room-temperature water.



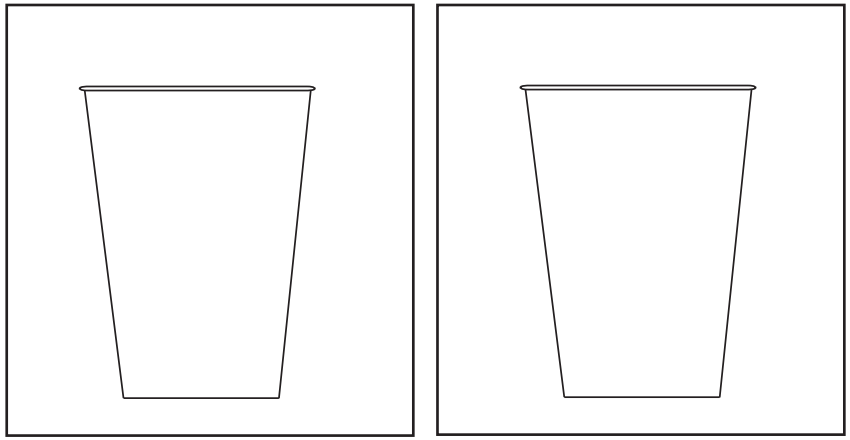
Which is denser, hot water or cold water? _____

How do you know?

SINKING AND FLOATING WATER

Draw a picture of what happened when you lowered **hot** water into a cup of room-temperature water.

Draw a picture of what happened when you lowered **cold** water into a cup of room-temperature water.



Which is denser, hot water or cold water? _____

How do you know?

FOSS Water Module
Investigation 2: Hot Water, Cold Water
No. 7—Student Sheet
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OBSERVING ICE

WATER IN VIALS

Draw a picture of a vial of liquid water.

Draw a picture of a vial of frozen water.

WATER IN SYRINGES

What was the volume of liquid water in the syringe before it froze? _____

What was the volume of the ice after you froze the water? _____

What was the difference in volume after you froze the water? _____

Write a sentence to describe what happens to the volume of water when you freeze it.

OBSERVING ICE

WATER IN VIALS

Draw a picture of a vial of liquid water.

Draw a picture of a vial of frozen water.

WATER IN SYRINGES

What was the volume of liquid water in the syringe before it froze? _____

What was the volume of the ice after you froze the water? _____

What was the difference in volume after you froze the water? _____

Write a sentence to describe what happens to the volume of water when you freeze it.

FOSS Water Module
Investigation 2: Hot Water, Cold Water
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No. 8—Student Sheet
Can be duplicated for classroom or workshop use.

RESPONSE SHEET—HOT WATER, COLD WATER

Last January it got very cold in a town in Wisconsin. The temperature was below –15°C for more than 7 days in a row. Students came into class on the third day, telling stories about water pipes bursting in their neighborhood.

Their teacher asked them to think about why this happened.

Write a note to this teacher. Explain why you think the pipes broke during this freezing cold weather.

RESPONSE SHEET—HOT WATER, COLD WATER

Last January it got very cold in a town in Wisconsin. The temperature was below –15°C for more than 7 days in a row. Students came into class on the third day, telling stories about water pipes bursting in their neighborhood.

Their teacher asked them to think about why this happened.

Write a note to this teacher. Explain why you think the pipes broke during this freezing cold weather.

FOSS Water Module Investigation 2: Hot Water, Cold Water
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Can be duplicated for classroom or workshop use.

EVAPORATION LOCATION CHARTS

Amount of evaporation	Letter of location
Most evaporation	
Second most evaporation	
Third most evaporation	
Least evaporation	

Letter of location	Temperature of evaporation location
	Warmest location
	Second warmest location
	Third warmest location
	Coolest location

Where did the most water evaporate, at the warmest location or the coolest location?

Where did the least water evaporate, at the warmest location or the coolest location?

EVAPORATION LOCATION CHARTS

Amount of evaporation	Letter of location
Most evaporation	
Second most evaporation	
Third most evaporation	
Least evaporation	

Letter of location	Temperature of evaporation location
	Warmest location
	Second warmest location
	Third warmest location
	Coolest location

Where did the most water evaporate, at the warmest location or the coolest location?

Where did the least water evaporate, at the warmest location or the coolest location?

FOSS Water Module
Investigation 3: Water Vapor
No. 10—Student Sheet
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Can be duplicated for classroom or workshop use.

RESPONSE SHEET—WATER VAPOR

A student helped his mother carry in groceries from the car on a warm, sunny day. On the way into their apartment, he noticed that a bottle of water was cracked and had left a puddle on the sidewalk. When he went back outside, he noticed that the puddle was gone.

Later that evening he wrote this note in his journal.

That puddle of water was a real mystery! It was about 25 cm across. When I came back outside about 15 minutes later after helping Mom put the groceries away, the puddle was gone. I wonder if the neighbor's cat drank the water. I hope they remember to put water in its bowl tonight.

Write a note to this student. Explain any ideas you have about why the puddle disappeared so quickly.

RESPONSE SHEET—WATER VAPOR

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Write a note to this student. Explain any ideas you have about why the puddle disappeared so quickly.

FOSS Water Module
Investigation 3: Water Vapor
No. 11—Student Sheet
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Can be duplicated for classroom or workshop use.

SURFACE-AREA CHART

	Graduate	Beaker	Dome lid	Flat lid
Amount of water at start				
Amount of water at end				
Amount of water evaporated				
Ranking (1=most evaporated; 4=least evaporated)				

Why do you think you got these results for this investigation?

SURFACE-AREA CHART

	Graduate	Beaker	Dome lid	Flat lid
Amount of water at start				
Amount of water at end				
Amount of water evaporated				
Ranking (1=most evaporated; 4=least evaporated)				

Why do you think you got these results for this investigation?

FOSS Water Module
Investigation 3: Water Vapor
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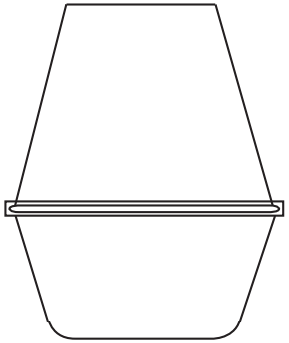
No. 13—Student Sheet

CONDENSATION OBSERVATIONS

Write a sentence to describe any changes you observed in the condensation chamber the day after you set it up.

Draw a picture here of what you observed.



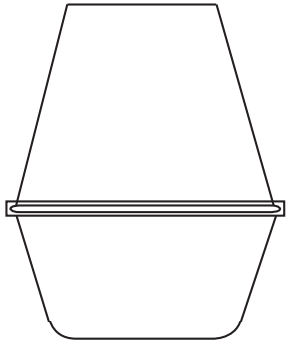
List at least five places where you have observed condensation.

Choose one of the places on your list and explain why you think condensation happened.

CONDENSATION OBSERVATIONS

Write a sentence to describe any changes you observed in the condensation chamber the day after you set it up.

Draw a picture here of what you observed.



List at least five places where you have observed condensation.

Choose one of the places on your list and explain why you think condensation happened.

FOSS Water Module
Investigation 3: Water Vapor
No. 14—Student Sheet
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WATER IN EARTH MATERIALS

Materials

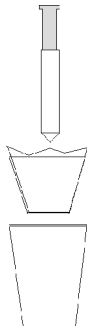
2	Large plastic cups
2	Filter cups with holes
1	Plastic cup with gravel
1	Plastic cup with soil
2	Filter papers
1	Balance
1	Syringe, 50-ml
1	Graduated cylinder
2	Hand lenses

PROCEDURE

1. Place a filter paper in each filter cup with holes.
2. Pour soil into one filter paper until the cup is three-quarters full.
3. Set the cup with the soil and filter paper on one side of the balance.
4. Set the cup with filter paper on the other side of the balance.
5. Add gravel to the empty filter paper until the balance is level. You should now have the same mass of soil and gravel in the two cups.
6. Put each cup in a large plastic cup.
7. Use the syringe to carefully squirt 50 ml of water in each filter cup. Observe what happens.
8. After the water has stopped draining into the large cup (about 5 minutes), put the soil and gravel cups on the balance. What do you notice?

MEASUREMENTS

Use the syringe and graduated cylinder to measure the amount of water that drained into the large cups. Record your answers below.

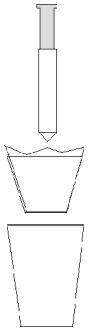


SOIL

Amount of water added with syringe _____

Amount of water left in soil _____

Amount of water drained into large cup _____



GRAVEL

Amount of water added with syringe _____

Amount of water left in gravel _____

Amount of water drained into large cup _____

WATER IN EARTH MATERIALS

Materials

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2	Filter cups with holes
1	Plastic cup with gravel
1	Plastic cup with soil
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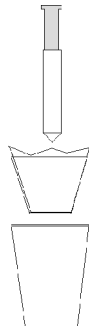

SOIL

Amount of water added with syringe _____

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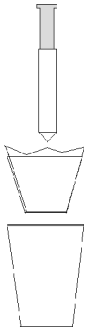

GRAVEL

Amount of water added with syringe _____

Amount of water left in gravel _____

Amount of water drained into large cup _____

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Investigation 4: Waterworks
No. 15—Student Sheet

RESPONSE SHEET—WATERWORKS

Gina wanted to find out what brand of soil is best for planting beans. The directions on the seed package suggested that the seeds would grow best in earth material that drains well. So, Gina went to the store and bought three different brands of potting soil.

Explain, step-by-step, what Gina should do to test the soils before she plants the seeds to see which drains the best. Be sure to tell how she will know which soil she should use.

RESPONSE SHEET—WATERWORKS

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Explain, step-by-step, what Gina should do to test the soils before she plants the seeds to see which drains the best. Be sure to tell how she will know which soil she should use.

FOSS Water Module
Investigation 4: Waterworks
No. 16—Student Sheet
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PUTTING WATER TO WORK

THE WATERWHEEL CHALLENGE

Use the following materials to make a waterwheel that can lift a mass on a string.

Materials

5	Plastic disks	3	Medium binder clips
1	Basin	1	String, 1 meter long
1	Dowel for Waterwheel	1	Container
•	Water	1	Syringe, 50-ml

Work with your group to come up with a design for a waterwheel.

Draw a picture of your design.

How many 50-ml syringefuls of water did you need in order to wind the string all the way up to the top? _____

PUTTING WATER TO WORK

THE WATERWHEEL CHALLENGE

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Draw a picture of your design.

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Investigation 4: Waterworks
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No. 17—Student Sheet

COMPARING WATER SAMPLES

	Sample 1 collected by (name) _____	**Sample 2** collected by (name) _____	**Sample 3** collected by (name) _____	**Sample 4** collected by (name) _____
source				
color				
clarity				
odor				
particles				
organisms				
evaporation results				
other observations				

COMPARING WATER SAMPLES

	Sample 1 collected by (name) _____	**Sample 2** collected by (name) _____	**Sample 3** collected by (name) _____	**Sample 4** collected by (name) _____
source				
color				
clarity				
odor				
particles				
organisms				
evaporation results				
other observations				

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Investigation 4: Waterworks
No. 18—Student Sheet

FOSS WATER MODULE

PROJECT PROPOSAL

1. What is the question or the project that you are proposing?

2. What materials or references will you need to complete the project?

3. What steps do you need to take to complete the project?

FOSS WATER MODULE

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1. What is the question or the project that you are proposing?

2. What materials or references will you need to complete the project?

3. What steps do you need to take to complete the project?

FOSS Water Module
Investigation 4: Waterworks
No. 20—Student Sheet
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RAINDROP STORIES

Write at least ten words that describe water and its properties.

Write a story about a raindrop that fell into a river flowing from the top of a mountain. Use another sheet of paper to draw a picture to illustrate your story.

RAINDROP STORIES

Write at least ten words that describe water and its properties.

Write a story about a raindrop that fell into a river flowing from the top of a mountain. Use another sheet of paper to draw a picture to illustrate your story.

FOSS Water Module
Investigation 4: Waterworks
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No. 22—Student Sheet