

# Making Sense of Water



Where does water go and how  
does it move?

## Student Materials

Name: \_\_\_\_\_

# MoHSES: Modeling Hydrologic Systems in Elementary Science

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## Pre-Unit Task

### Constructing a Water Cycle Model

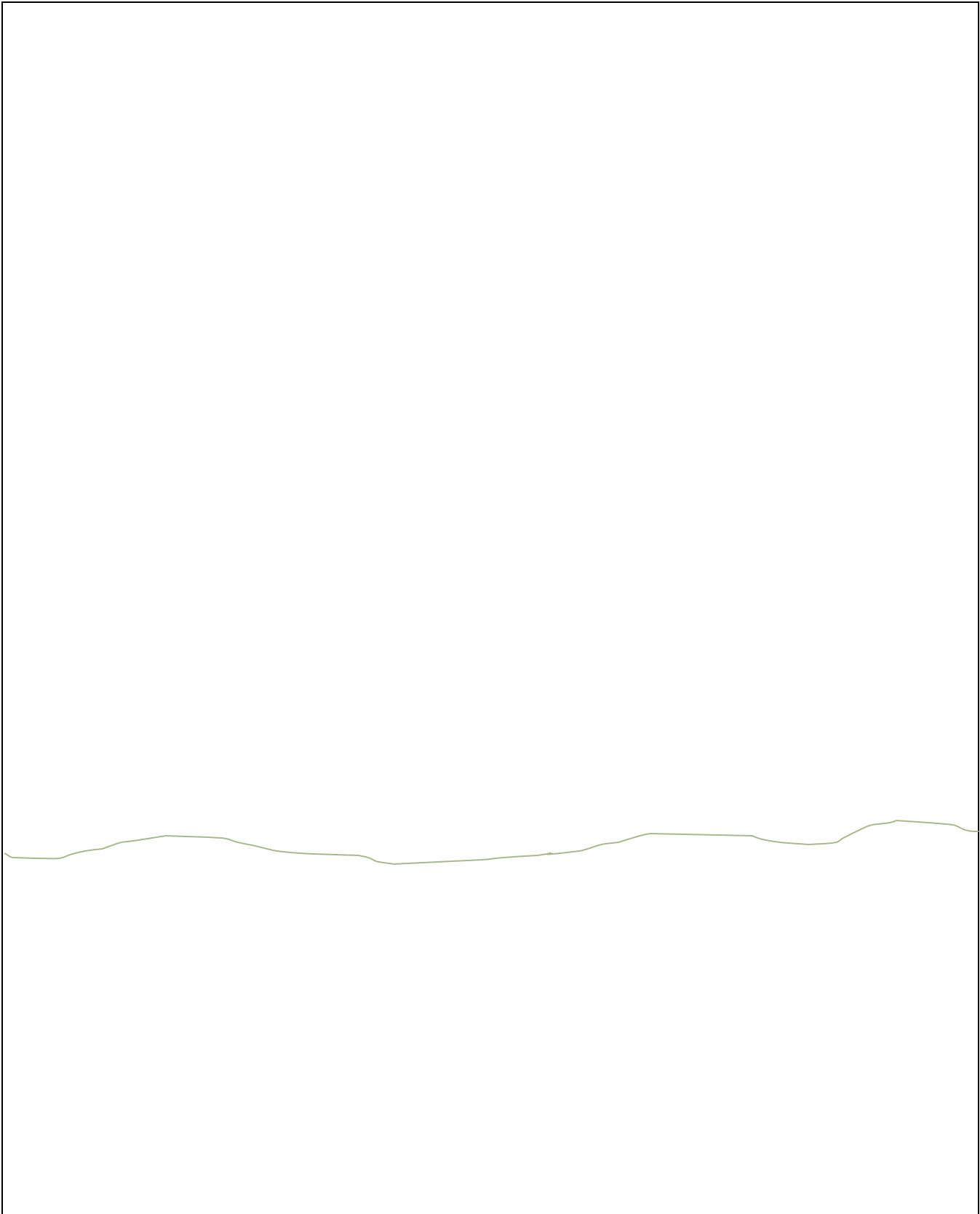
Imagine that you are on the school playground after a huge rainstorm. There are many places where there is water. Some places have large puddles. There is also water in ditches and moving to the drains. You go out the next day and you see that some of that water is not there anymore. You also see some areas where the water is still in larger puddles.

What happened to the water that is gone?

Where did it go and how did it do that?

Why is some of the water still on the ground? How did it move?

On the next page in the big box, draw a model of **what you think happened to the water on the playground both above and below the ground in your model**. Include what you think happened to water above and below the ground.







# Investigation 1: Water Observations

## Using Your Model to Investigate and Explain

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### Prediction

Look back at your model about what happened to the water on the playground. You might have noticed that where the water collected and made puddles had something to do with whether there was a hill or a dip in the ground. Let's find out more about how that happens. Use your model to make a prediction about what you think will happen to water on a slope.

I predict water will move downhill faster on a (steeper/gradual)

slope because \_\_\_\_\_

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### Thinking about Investigating

If you were to test what happens to water on a slope, how would you do it? What kind of investigation would you do?

You can draw your proposed investigation here:





## Observation

I observed water moving downhill faster on a           (steeper/gradual)           slope.

My observations showed that...

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You can draw your observations here:

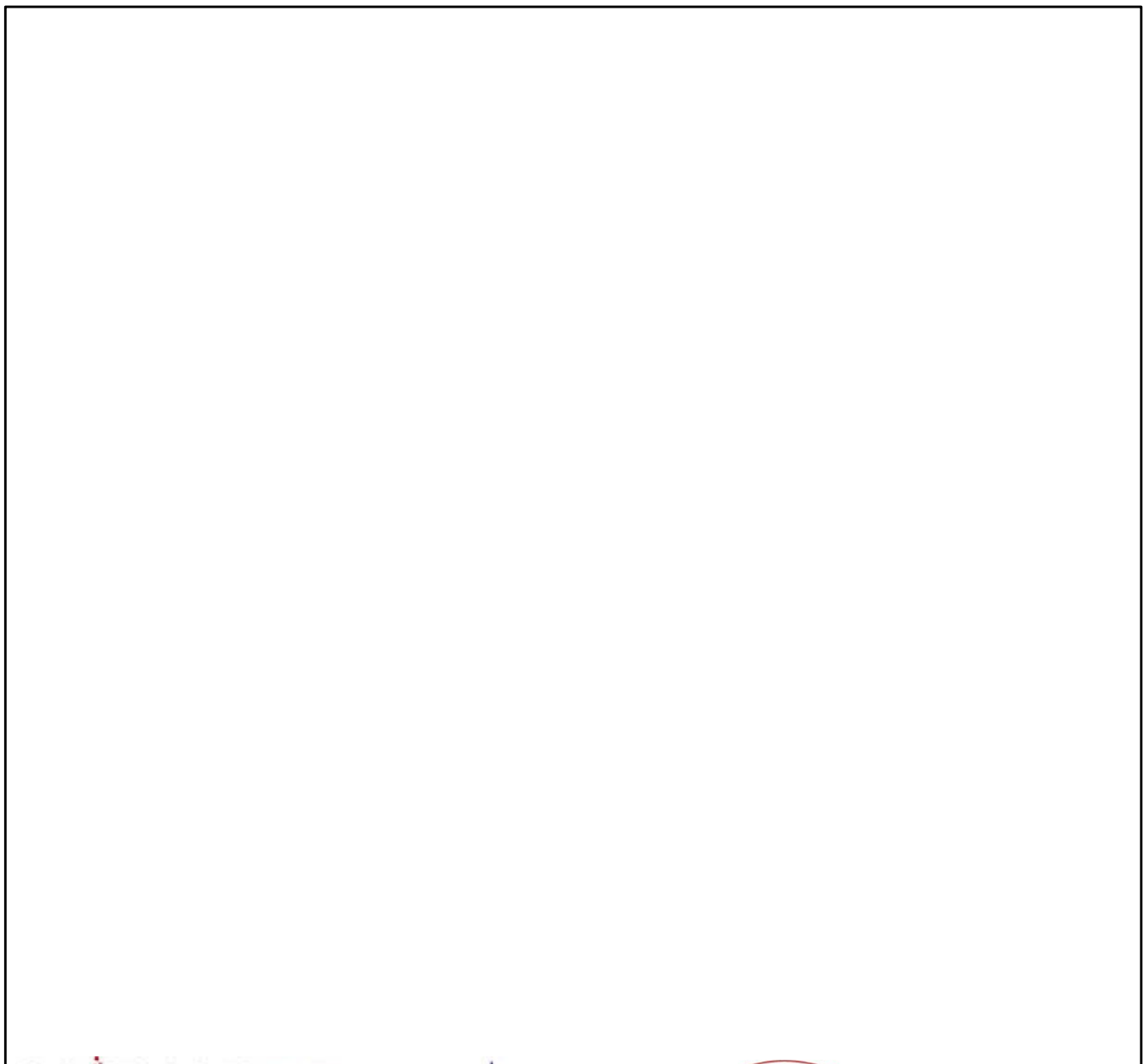
## Investigation 1: Water Observations, Part 4

### Drawing a Model of What You Found in Your Investigation



Draw a model showing how and why water flows down a slope. You can use dashed lines to show speed and solid lines to show direction. Use your observations and your ideas to show

- Water flows downhill, sometimes faster, sometimes slower
- As a hill becomes steeper, water flows faster
- Gravity is the force that causes water to move downhill



What does your model show happening to water?

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**My explanation**

Water moves downhill faster on a \_\_\_\_\_ (steeper/ gradual) \_\_\_\_\_ slope because

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# Investigation 1: Water Observations, Part 4

## Evaluating Your ORIGINAL Model of Water on the Playground



Now, look back at your model from the beginning of the unit and answer the following questions:

Rate your model

1. Does your model show water moving downhill?

What could you add in your model to show water moving downhill?

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2. Does your model show that a steeper slope causes water to move downhill faster?

What could you add in your model to show a steeper slope causes water to move downhill faster?

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3. Does your model show gravity as the reason water moves downhill?

What could you add in your model to show gravity as the reason water moves downhill?

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What would you **change** or **add** to your original model to show water moving downhill?

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Use a **RED** pencil on your original model to add your changes.

## Investigation 1, Part 3: Water on a Slope

### OPTIONAL WORKSHEET- 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:

- How the tent flooded
- Why her family should think about where to pitch their tent next time they go camping.

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## Investigation 3: Water Vapor

### Using Your Model to Investigate and Explain



#### Prediction

Look back at your model about what happened to water on the playground. You might have noticed that after it rains, puddles form but then disappear! Let's find out more about how that happens. Use your model about what happened to the water on the playground to make a prediction about what you think will happen to water in the cups.

I predict water will evaporate faster where temperature is       (hotter / colder)        
because

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#### Thinking about Investigating

If you were to test where the water goes when it appears to disappear, how would you do it? What kind of investigation would you do?

You can draw your proposed investigation here:

In my investigation, I would... \_\_\_\_\_

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### Observation

I observed water evaporating faster where temperature is \_\_\_\_\_ (hotter / colder) .

My observations showed that:

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You can draw your observations here:

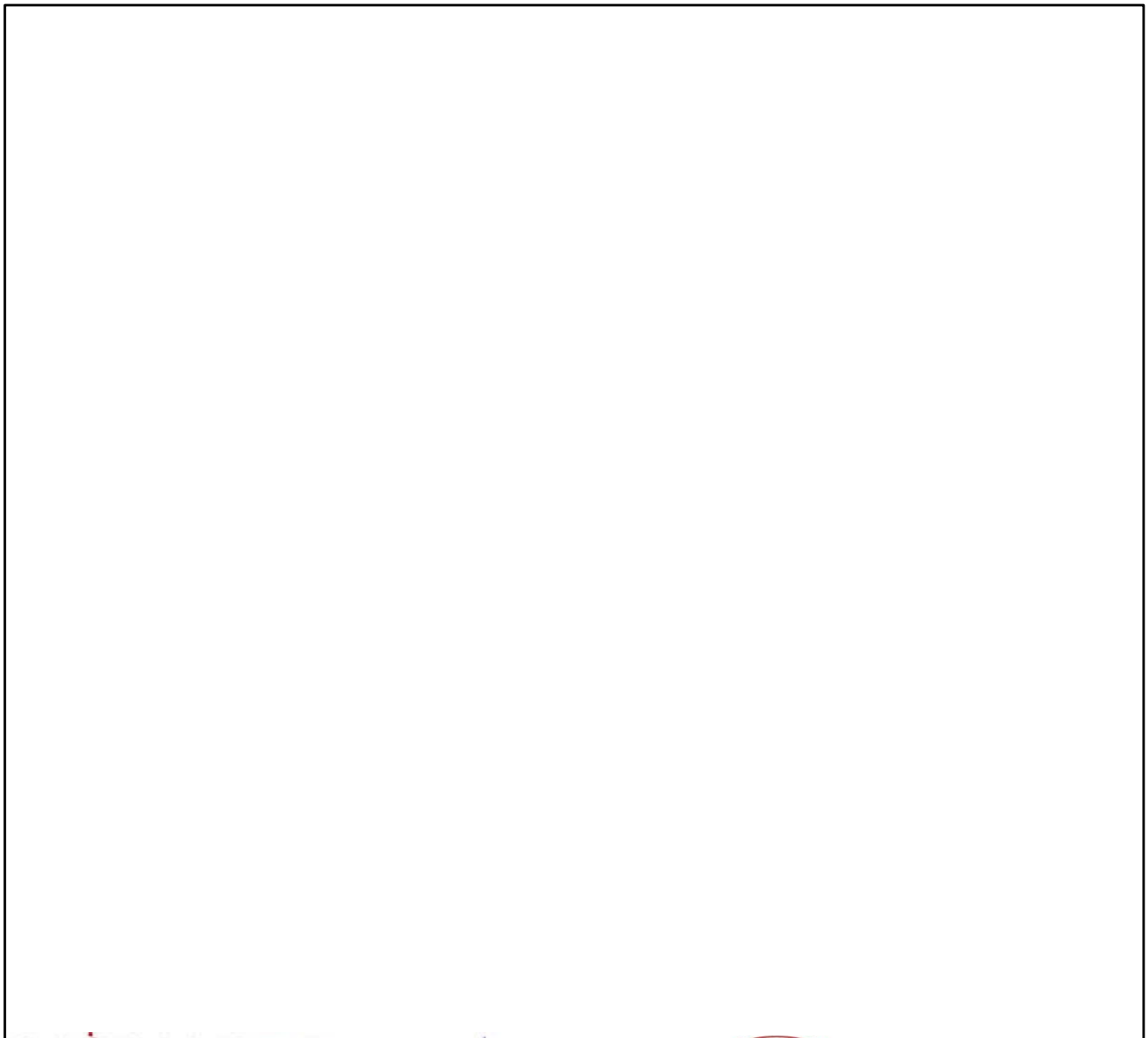
## Investigation 3: Water Vapor

### Drawing a Model of What You Found in Your Investigation

.....  
Draw a model of your investigation showing how and why water evaporates over time.

Use your observations and your ideas to show

- Water evaporates, sometimes faster, sometimes slower
- As temperature increases, water evaporates faster
- Heat is a form of energy that influences evaporation



What does your model show happening to water?

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**My explanation**

Water evaporates due to  (hot/cold)  because \_\_\_\_\_

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## Investigation 3: Water Vapor

### Evaluating Your ORIGINAL Model of Water on the Playground



Now, look back at your model from the beginning of the unit and answer the following questions:

Rate your model

1. Does your model show water evaporating?

What could you add in your model to show water evaporating?

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2. Does your model show higher temperature /heat causing evaporation?

What could you add in your model to show higher temperature/heat causes evaporation?

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3. Does your model show energy as the reason water evaporates?

What could you add in your model to show energy as the reason water evaporates?

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What would you **change** or **add** to your original model to show how and why water evaporates over time?

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Use a **GREEN** pencil on your original model to add your changes.

**OPTIONAL WORKSHEET- Water vapor**

My friend wears a T-shirt when he goes swimming so he won't get sunburned. After swimming, he hangs up the wet shirt. After a while it is dry. My friend said "I've always wondered how the wet shirt gets dry."

1. What would you tell my friend to help him understand how the shirt gets dry?

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2. What would you suggest that my friend do to get the shirt dry as fast as possible?

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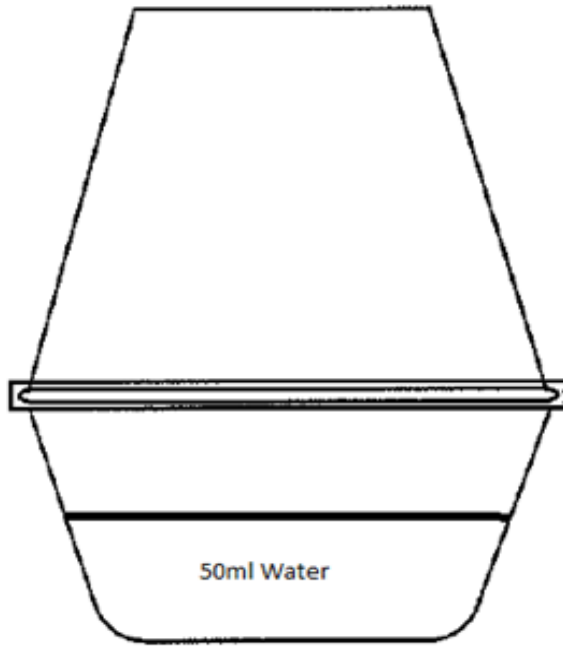
3. Explain why your suggestion would made the shirt dry quickly.

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## OPTIONAL WORKSHEET- Condensation Observations



What was the temperature where you placed your condensation chamber?

\_\_\_\_\_

Use arrows on the drawing to show how and where the water moved while the condensation chamber was in a sunny place.

What changes did you observe in the condensation chamber?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Why do you think this happens?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Investigation 4: Waterworks

### Using Your Model to Investigate and Explain



#### Prediction

Look back at your model about what happened to water on the playground. You might have noticed that after it rains, the ground becomes soft. Let's find out more about how that happens. Use your model about what happened to the water on the playground to make a prediction about what you think will happen to water to water in Earth materials.

I predict water will move through the gravel \_\_\_\_\_ (faster / slower) \_\_\_\_\_ than soil because \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I predict water will move through the sand \_\_\_\_\_ (faster / slower) \_\_\_\_\_ than soil because \_\_\_\_\_  
\_\_\_\_\_

#### Thinking about Investigating

If you were to test what happens to water moving through earth materials, what kind of investigation would you do? Draw a model of your idea and describe it using the space below.



You can draw your proposed investigation here:

In my investigation, I would... \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Observation**

I observed water moving through the gravel \_(faster/slower)\_ than soil  
AND

I observed water moving through the sand \_(faster/slower)\_ than soil.

My observations showed that:

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You can draw your observations here:

## Investigation 4: Waterworks

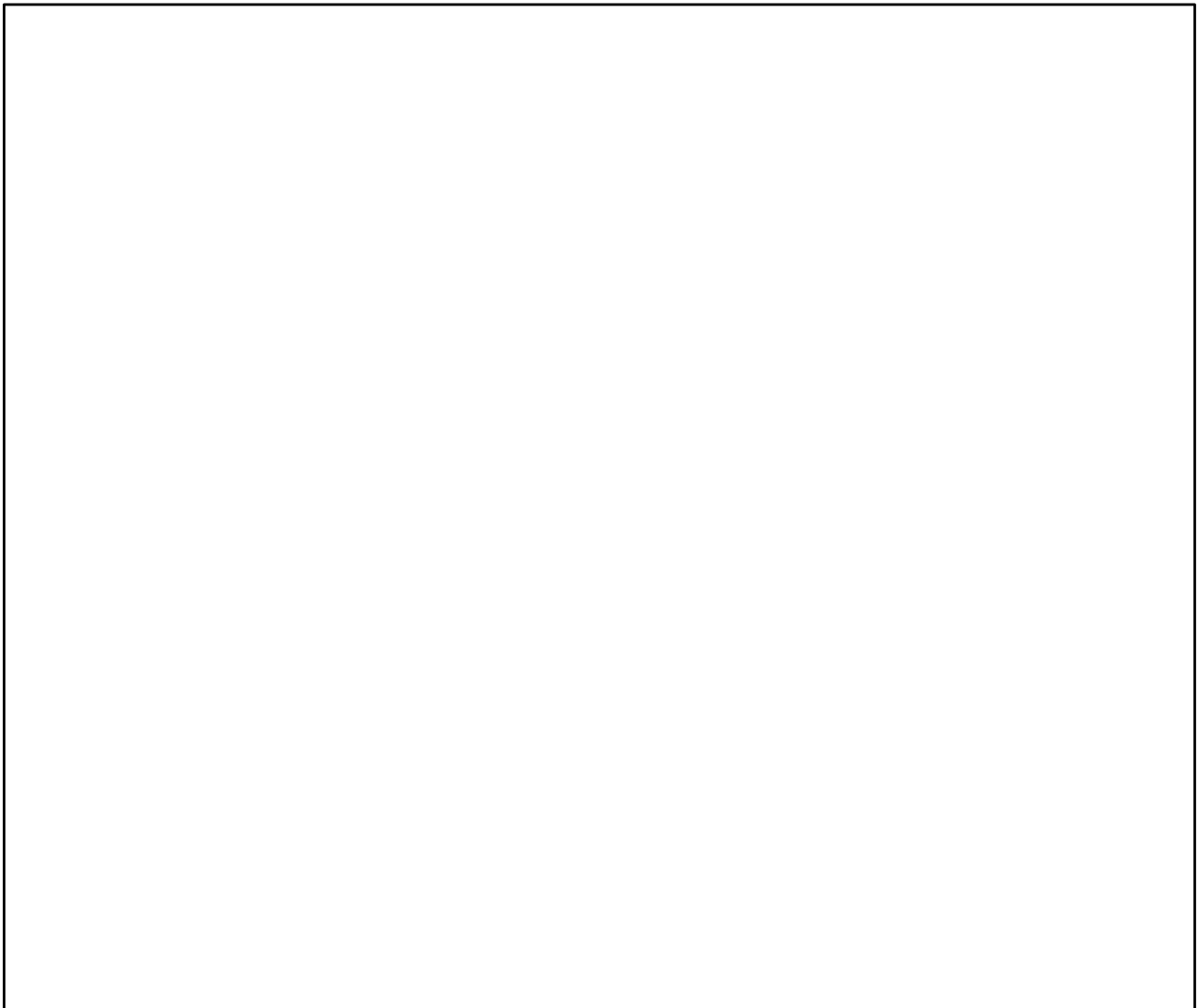
### Drawing a Model of Your Investigation



Draw a model of how and why water moves through Earth materials.

Use your observations and your ideas to show:

- Water flows downward through Earth materials, sometimes faster, sometimes slower
- As the size of the particles of Earth materials increases, water flows through it faster
- Gravity is the force that causes water to move downward through Earth materials



What does your model show happening to water?

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I observed water moving through the gravel (faster/slower) than soil

AND the sand (faster/slower) than soil because \_\_\_\_\_

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# Investigation 4: Waterworks

## Evaluating Your ORIGINAL Model of Water on the Playground



Now, look back at your model from the beginning of the unit and answer the following questions:

Rate your model

1. Does your model show water moving down through Earth materials?

What could you add in your model to show water moving down through Earth materials?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Does your model show larger particles causing water to move downward through Earth materials faster?

What could you add in your model to show water moving faster through large particles in Earth materials?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Does your model show gravity as the reason water moves downward through Earth materials?

What could you add to your model to show gravity as the reason water moves downward through Earth materials?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What would you **change** or **add** to your original model to show water how and why water moves through Earth materials?

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Use a **BLUE** pencil on your original model to add your changes.



## Post-Unit Task

### Constructing a Model of Water Systems

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Imagine that you are on the school playground after a huge rainstorm. There are lots of places where there is water. Some places have large puddles. There is also water in ditches and moving to the drains. You go out the next day and you see that some of that water is not there anymore. You also see some areas where the water is still in larger puddles.

What happened to the water that is gone?

Where did it go and how did it do that?

Why is some of the water still on the ground? How did it move?

You have now investigated what might happen in a school playground after a huge rainstorm. Use the box on the next page to draw a model what you think happened to the rain and why. Include what you think happened to water above and below the ground.



