

# Interactive Reading & Notetaking Teacher's Guide

## SOL 6.5 PART 1 ~ PROPERTIES OF WATER

Ask Questions, Show & Tell, Make Inferences or Predictions, Make Connections, Scientific Investigation

### Paragraph 1

*Ask questions (Student generated; answers can be found in the paragraph):*

- What is water?
- What makes up a water molecule?
- What is an interesting property of water?
- Why does this occur?
- Why are water molecules called *polar* molecules?
- What is cohesion?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Connections (Teacher generated):*

- Help students make a connection to what they know about the poles of magnets and why the word *polar* is used to describe water molecules.

*Make Inferences or Predictions (Teacher generated):*

→ Use links to activate or build background knowledge. Make sure students cite evidence by tracing their discoveries and understandings back to the content and vocabulary contained within the notepage and/or supplemental text.

- *Think!* How does water behave in a way that is similar to a magnet? *Show us the evidence!*

### Paragraph 2

*Ask questions (Student generated; answers can be found in the paragraph):*

- What is surface tension?
- What type of surface tension does water have?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

### Paragraph 3

*Ask questions (Student generated; answers can be found in the paragraph):*

- What other property do water molecules have?
- What are water molecules attracted to?
- Where else does this adhesive property of water occur?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Inferences or Predictions (Teacher generated):*

- *Think!* What might happen to plants if water molecules no longer had adhesive properties? *Show us the evidence!*
- *Think!* Should rain coats and umbrellas be made out of substances that have polar molecules? *Show us the evidence!*

Scientific Investigation (Teacher generated):

→ Use links to activate or build background knowledge. Make sure students cite evidence by tracing their discoveries and understandings back to the content and vocabulary contained within the notepage and/or supplemental text.

🔗 [Cool Water Polarity Video](#)

- Investigate the adhesive properties of water by trying the experiment demonstrated.
- Construct a sketch or model of a water molecule. Explain the shape and composition.

*Make Inferences or Predictions (Teacher generated):*

- *Think!* What role does static electricity have in attracting water molecules? *Show us the evidence!*

### Paragraph 4

*Ask questions (Student generated; answers can be found in the paragraph):*

- What type of substances will dissolve in water?
- What is water often called?
- What happens when substances dissolve in water?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Inferences or Predictions (Teacher generated):*

- *Think!* How might our lives be different if water were not a universal solvent? *Show us the evidence!*

Scientific Investigation (Teacher generated):

→ Use links to activate or build background knowledge. Make sure students cite evidence by tracing their discoveries and understandings back to the content and vocabulary contained within the notepage and/or supplemental text.

🔗 See [Universal solvent investigation](#) (with Standard 6.1a).

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### Paragraph 5

*Ask questions (Student generated; answers can be found in the paragraph):*

- What is key to some of the life processes of living organisms?
- What are some of these life processes?
- How does the property of water affect living organisms?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Connections (Teacher generated):*

- Have students connect to their knowledge of life processes in their study of animal and plant cells in 5<sup>th</sup> grade.

Scientific Investigation (Teacher generated):

→ Make sure students cite evidence by tracing their discoveries and understandings back to the content and vocabulary contained within the notepage and/or supplemental text.

- Students will describe water's presence in plant life (see investigation on page 4).

### Paragraph 6

*Ask questions (Student generated; answers can be found in the paragraph):*

- What is another property of water?
- How does water's high specific heat affect climate?
- How does it affect living organisms?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

Scientific Investigation (Teacher generated):

→ Use links to activate or build background knowledge. Make sure students cite evidence by tracing their discoveries and understandings back to the content and vocabulary contained within the notepage and/or supplemental text.

- Check out the difference between average winter temperatures in the state of VA for areas close to the Chesapeake Bay and Atlantic Ocean as compared to areas to the west using data from [VA's Historical Climate map](#).

*Make Inferences or Predictions (Teacher generated):*

- *Think!* Is Virginia's climate affected by water's property of specific heat? Explain. *Show us the evidence!*

### Paragraph 7

*Ask questions (Student generated; answers can be found in the paragraph):*

- What is another interesting property of water?
- What is this large range of temperatures?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Inferences or Predictions (Teacher generated):*

- *Think!* What might happen on Earth if this range were smaller? Larger? *Show us the evidence!*

### Paragraph 8

*Ask questions (Student generated; answers can be found in the paragraph):*

- Where is some water on Earth located?
- In what state (or phase) is the water that is locked in ice caps and glaciers?
- How is water different from other substances on Earth?
- Why does this occur?

*Show & Tell:*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Inferences or Predictions (Teacher generated):*

- *Think!* Based on what we know, explain why soda cans explode when they are left in the freezer too long. *Show us the evidence!*

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### **Paragraph 9**

*Ask questions (Student generated; answers can be found in the paragraph):*

- Why is ice less dense than liquid water?
- What is ice able to do because of the wide spacing of its molecules?
- What would happen in nature if ice was denser than liquid water?

### *Show & Tell*

- Have students use a picture to store the information in their brain folder.
- Have students retell their graphic to a partner!

*Make Inferences or Predictions (Teacher generated):*

- *Think!* What would happen to the Arctic region if ice were not less dense than liquid water? *Show us the evidence!*
- *Think!* What would happen to our oceans and coastal regions? *Show us the evidence!*

### **SUGGESTED WORD CARDS OR WORD WALL:**

- cohesion
- surface tension
- adhesive
- universal solvent
- specific heat

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### SUGGESTED SCIENTIFIC INVESTIGATION /SOL 6.5 PART 1 (with Standards 6.1a,b,d,g,h)

This investigation requires students to determine the presence of water in plant material. By making systematic observations and measurements of a thinly sliced apple as it progresses through the dehydration process, students will observe the process of evaporation at work and prove that water is a significant component in plant tissue.

#### **Materials:**

1. An apple
2. Sharp knife
3. Balance or Scale
4. Aluminum foil
5. Lamp and/or Fan (optional)

#### **Procedure:**

1. Weigh the apple and aluminum foil upon which you will dry the apple.
2. Cut the apple in very thin slices in order to accelerate the drying process and spread the slices over the aluminum foil.
3. Keep it in a warm place (preferably under a lamp) until it is fully dry. You can expect it to take 24 - 48 hours depending on the environment.
4. Weigh the apple 3 – 4 times throughout the drying process. Remember: Always subtract the weight of the aluminum foil.

#### **Directions:**

1. Begin by making a hypothesis.
2. Record changes in the apple over time in the chart below.

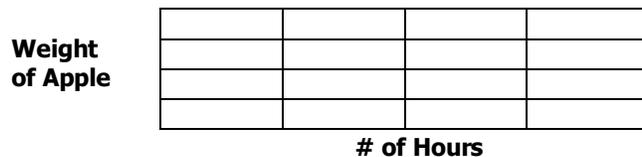
Each time the apple is weighed, you will record the # of hours drying (IV), the weight of the apple (DV), and specific observations about the apples (use more than just what you see with your eyes).

**Hypothesis:** If the time that an apple is allowed to dehydrate is increased, then the mass of the apple will

IV: # of Hours Drying	DV: Mass of the Apple (g)	Observations made with your senses:

#### **Graph:**

Construct a line graph to show how the weight of the apple changes.



#### **Conclusions:**

1. What can you conclude about the amount of water in an apple based on the results of the experiment?
2. What do you predict would happen if this experiment were to be repeated with different plant material?

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## SOL 6.5 PART 1 ~ PROPERTIES OF WATER

### SOL Alignment

*The question below demonstrates one way this standard might be assessed.*

**1** In Virginia, the coastal areas receive significantly less snow than inland areas because the Chesapeake Bay and the Atlantic Ocean stay well above freezing all winter and keep air temperatures in these areas warmer than the rest of the state. The ability for water to keep its warmth well into the winter relates to water's —

- A specific heat
- B polarity
- C adhesion
- D cohesion

**Prove it! Cite evidence from your notebook.**