

Matter

Grade-Level Expectations

The exercises in these instructional tasks address content related to the following science grade-level expectation(s):

PS-E-A4 Observe and describe common properties of solids, liquids, and gases (GLE 16)

PS-E-A4 Sort and classify objects by their state of matter (GLE 17)

ESS-E-A3 Illustrate how water changes from one form to another (e.g., freezing, melting, evaporating) (GLE 37)

Contents

- These instructional tasks contain a set of document- or resource-based exercises about *the properties of matter*.
- Teachers may choose to use or modify the tasks as part of an instructional lesson or as a formative or summative assessment.
- The printable student version excludes teacher directions.

	Objective(s)
Scaffolding Exercise 1	<ul style="list-style-type: none"> • Draw conclusions based on a story and prior knowledge
Scaffolding Exercise 2	<ul style="list-style-type: none"> • Classify items as solid, liquid, or gas • Explain their thinking or reasoning
Culminating Exercise	<ul style="list-style-type: none"> • Analyze a response for correctness • Use scientific knowledge to justify an answer
Scoring Rubric	
Scoring Notes	
Printable Student Version	

Teacher Directions: Have students fold a piece of paper into 6 sections. Read the following story to your class. After each paragraph, have students draw, in one of their sections, a picture of what happened. At the end, have students label each drawing as solid, liquid, or gas.

I'm Matter

I woke up this morning and tried to get out of bed, but I quickly realized this was not going to be a normal day. I was NOT myself. It seems that all this learning about matter in my science class has changed me. Really, it has changed me. I think I have turned into a water molecule.

I rolled off my bed and rolled down the stairs and rolled right past my mom (who didn't even notice me) and rolled out the door. I kept rolling and rolling until I hit the road. I lay there for a few minutes. It was hard work rolling that far! Man, it sure is hot out here. I felt my inside begin moving faster and faster. Even though I was being still, I felt like my atoms were going to jump out of my chest. The longer I lay on the road, the faster and faster my atoms were bouncing around. It must have something to do with this heat and the sun shining on me.

After a little while, I couldn't lay there any longer! My atoms were just moving too fast. I felt myself lifting into the air. I'm flying! Higher and higher and higher I'm going. I see my house, my neighborhood, my school, my city, my country. I think I'm going to end up in space!

I look around and I see other molecules that have evaporated into the air around me. I keep bouncing off of others. I try to say "excuse me" like my mom taught me but it's hard when I keep hitting so many. I'm moving too fast to have good manners! Wait a minute, I think it's getting a little cooler. I feel myself slowing down. I feel like I want to touch the other molecules around me. We join together in a big group. It's nice to snuggle when it is this cold up here.

Man, it is getting colder and colder up here. I feel like I'm getting really sleepy. My atoms are slowing waaaaay down! Brrr. I try to roll away from my new friends so that I can find a warmer place but we are stuck together. Not only are we stuck, we really can't move at all. I feel really slow and really hard. What was it my teacher said happens to water when it gets cold? I'm so cold I can hardly think! Oh yeah, she said it can change its state of matter. I think I've changed. I'm definitely not the same as I was when I woke up this morning.

Oh no, I think I'm falling. Falling, falling, falling..... I see my city, my school, my neighborhood, my house. As I fall, I'm getting warmer. Plop. I land in a puddle. This has been a very exciting day, but I'm ready to be back to myself again. I roll over to the door of my house and wait for someone to come outside. When the door opens, I roll right in (my mom doesn't even notice me). I roll over to my dog. I grab on to his fur and hope that he will soon go upstairs. Finally, I feel him get up. He goes to my room (I guess he's trying to figure out where I am). He jumps on my bed. I let go of his fur and drop on to my pillow. I hope if I go to sleep I will wake up and find this has all been a dream. I can't wait to tell my science teacher about my adventure as the 3 states of matter!

Student Directions

Part 1: You decide to open a grocery store with some friends. Instead of organizing your items like most stores do, you decide to make sections for solids, liquids, and gases. Work with your group to sort the groceries into those categories. Be ready to explain your thinking for each item.

Part 2: Create a sign for each section of your grocery store listing the common properties of the items in that section.





Sally's teacher showed the class a "matter mystery bag." Sally and her classmates could ask "yes" or "no" questions to try to find out what was in the bag. These are the questions they asked and the teacher's answers.

- | | |
|--|-----|
| 1. Are the particles really close together? | No |
| 2. Can the item change shape? | Yes |
| 3. Do the particles move fast when they are heated? | Yes |
| 4. Does it take the shape of the container? | Yes |
| 5. Will the item make a mess if the container is poured out? | Yes |

Sally guessed the mystery. She thinks there is a liquid in the bag.

Do you think Sally is right? Explain **two** reasons why you think she is right or wrong.

Rubric	
<p>Key Elements:</p> <p>A. Response clearly describes one reason Sally could be right.</p> <p>B. Response clearly describes a second reason Sally could be right.</p>	
2 Points	<p>Response includes both key elements.</p> <p>Response contains no scientific errors.</p>
1 Point	<p>Response includes one of the key elements.</p> <p>Response may include scientific errors.</p>
0 Point	<p>Response does not include any key elements.</p>

Scoring Notes

The following are examples only. All reasonable, valid responses should be accepted.

- Sally is right because the particles of a liquid are not really close together like the particles of a solid. They are closer than the particles of a gas though.
- Sally is right because liquids changes shape. It is not like a solid. Solids keep their shape even when you hold them.
- Sally is right because liquids particles move really fast when they are heated.
- Sally is right because liquids are the shape of whatever container they are in. If a liquid is on the floor, it makes a flat puddle.
- Sally is right because liquids make a mess if poured out. Gases and solids do not make a mess.

**Printable
Student Version**

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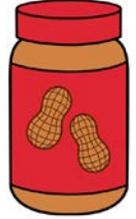
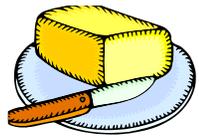
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