Reading Science

Name: _____ Date: _____

The Great Ice Challenge

1 The fifth-grade class at Eagle Lake Elementary was learning about the states of matter. They learned that matter was anything that contained mass and had volume, such as a chair, a person, and even air. Their teacher, Ms. Jones, also told them that matter could change **states**, or forms, depending on the temperature.

2 That does not make any sense," said Ivan. "A chair is always a chair, air is always air, and I'm always Ivan. I have never seen any of these change states."

3 "Hmm , , ," said Ms. Jones. "What if I can prove you wrong?"

4 The kids were excited, because this sounded like an interesting challenge.

5 The kids gleefully accepted the challenge and anxiously watched as Ms. Jones showed them an ice cube on a tray.

6 "Is this ice cube matter?" she asked them as she held up one of the ice cubes.

7 "Sure," said Tamara. "It definitely has mass, because we can put it on the triple beam balance and weigh it, and it also has volume, because it takes up space. I know that the ice cube is in a solid state of matter, because it has a specific size and shape. I also noticed that when you put it on the tray, the ice cube kept its shape."

8 "Great. So we all agree that this is matter," Ms. Jones said. "I removed it from the cafeteria freezer just a moment ago, so let us observe what happens as it warms up."

Reading Science

9 The fifth graders got out their observation notebooks and watched closely. They took detailed notes as the ice cube began to drip, creating a small puddle in the middle of the tray. Tamara predicted that the rate of melting might increase if they raised the temperature of the ice cube by adding a heat source.

10 “That’s an interesting idea, Tamara,” Ms. Jones said. “Can you think of a way that we might test your hypothesis?”

11 “I know!” said Tamara. “The overhead projector always heats up when we are using it. Let us place the tray on the projector and observe what happens then.”

12 Ms. Jones transported the tray to the overhead projector. The increase in temperature did make the ice cube melt faster, just as Tamara had predicted. In the short amount of time since the ice had been removed from the freezer, the ice cube melted completely, and all that remained was a puddle of water.

13 “Okay,” said Ivan. “I understand what you’re saying. When heat is added to a solid, it begins to melt, so melting is one way that matter can change states from a solid to a liquid.”

14 “Yes,” said Ms. Jones. “Even the chair can change states. It is made of metal and plastic. If I heated it to a high-enough temperature, the metal and plastic would melt and become liquid, just like the ice.”

15 “Yeah,” said Bobby. “One time when my mom was cooking, she accidentally melted a plastic spoon on the stove top. It turned to liquid, and it smelled terrible!”

16 “Right. Matter changes states.”

17 “You said even air can change,” said Ivan. “You still have not given us evidence to prove your point.”

18 “Just wait until tomorrow,” said Ms. Jones.

19 The kids packed up to go home, and Ms. Jones left the tray of water out on the table overnight. The next morning, when the students returned to school, they observed the tray that had contained the puddle of water. The tray was dry!

Reading Science

20 “What happened?” asked Tamara.

21 “I bet I know!” said Ivan. “Heat from the air in the classroom caused the water to evaporate. So, the matter changed states from a liquid to a gas.”

22 “Right. So where is the water now?” asked Ms. Jones.

23 “It is . . .” Ivan realized he had been beaten. “The water is in the air. So, now the air contains more water vapor than it did yesterday—and we lose the bet.”

24 “Yes,” said Ms. Jones. “The ice cube was in a solid state when I took it out of the freezer. Then, due to heat, it melted into a puddle of water, which is a liquid state. Finally, overnight, the temperature in the room caused the liquid to evaporate and become water vapor, which is a gas.

25 “However, the most important thing is that you were making detailed observations and thinking critically, like scientists, so I am going to give you that extra recess, anyway.”

26 All the kids cheered.

Reading Science

1. Here are some dictionary definitions of the word **state**:

1. (n) A nervous feeling
2. (n) A territory of the government
3. (n) The form of matter
4. (n) A part of the United States of America

Which definition is closest to the way the word **states** is used in the following sentence from the first paragraph?

Their teacher, Ms. Jones, also told them that matter could change states, or forms, depending on the temperature.

A. Definition 1

B. Definition 2

C. Definition 3

D. Definition 4

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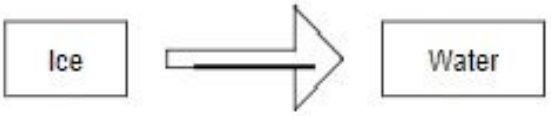
2. Which term should be placed in the arrow?



A. Evaporation

B. Heat

C. Gas

D. Liquid

Reading Science

3. What was Tamara's hypothesis?

A. The ice cube would evaporate.

B. The ice cube would refreeze if they put it in the freezer.

C. The ice cube would melt faster if they put it outside.

D. The ice cube would melt faster if the temperature were raised.

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4. Why did Ms. Jones give the students recess, even though they lost the bet?

A. She was proud of their thinking.

B. She wanted to take a break on Friday.

C. She always let them have extra recess on Friday.

D. They had behaved well.

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5. In this story, what did Ivan learn?

A. Always bet against Ms. Jones.

B. Ms. Jones never keeps her promises.

C. Matter can change states, even though a person may not be able to see it happen.

D. Matter never changes.