Name _____ Date _____ Class _____

SKILLS INTRODUCTION

Predicting

If a family moves into your neighborhood, your new neighbors may ask you questions like these: How many games will the school soccer team win? Will the math teacher give hard quizzes? How long will it take to get to the library? Questions like these ask you to make predictions. Predictions are a normal part of everyday life, but they also have an important place in science.

Predicting is making an inference about a future event based on current evidence or past experience. One way to make a prediction is to look for a pattern. For instance, depending on how many games your soccer team won last year, and whether the same players are on the team, you might make one of the predictions below. Notice that these predictions differ in how specific they are.

Example 1: Our team will lose a lot of games this year. (general)

Example 2: Our team will win about half of its games this year. (somewhat specific)

Example 3: Our team will win at least six games, but it will lose to Central Community School. (quite specific)

When you make a prediction in science, try to make it as specific as you can. Don't just guess. Consider all the experiences and knowledge you have about the topic. Also examine any new information you can obtain, by analyzing data tables and graphs, for example. Then make a reasonable inference based on all that information.

You may have made a logical prediction that did not come true. As a result, you probably know that predictions are not always correct. Because a prediction is an inference—an explanation or an interpretation of observations—it may not turn out to be true.

In science, predictions are usually tested. Some predictions can be tested by making observations. For instance, if someone predicts the times for sunrise and sunset over the next 30 days, you can test those predictions by using an accurate watch to time the events each day. On other occasions, carefully planned tests may be needed. For instance, suppose someone makes this prediction:

"This new medicine will prevent the common cold."

The only way to test such a statement would be to carry out a controlled experiment. Regardless of whether tests show a scientific prediction to be true or false, making and testing predictions is a proven way of increasing people's understanding of the natural world.

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Predicting *(continued)*

Tips for Making Predictions

- When you make a prediction about an event, don't just guess. Examine all the evidence that's available to you, including information in data tables and graphs. Also recall what you know about the topic.
- Look for a pattern in the evidence or in what you know. Consider how that pattern applies to the event you're predicting.
- If you don't have enough information, try to find out more about the event or about similar events.
- Don't be discouraged if your prediction turns out to be false. Remember that the purpose of making a prediction in science is to learn about the natural world. Always ask yourself, "What did I learn from making and testing this prediction?" Your early incorrect predictions may lead you to new questions and new predictions that will increase your knowledge.

Checkpoint Explain why making a prediction in science is different from just guessing.

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SKILLS PRACTICE

Predicting

Suppose you and your friend find a box filled with samples of different solid materials. All the samples come in cubes, and the cubes are all of the same size—1 cm on each side. (A cube is a solid figure having six square sides that are equal in size.)

You drop nine of the sample materials into a bucket of water. You observe that some cubes float. Some others sink. Using your observations and the information that comes with the samples, you make a data table that looks like this.

Table 1: Sinking/Floating Test Results

Sample Material	Mass of Cube	Observed Results
Apple tree wood	0.84 g	Floated
Asphalt	1.5 g	Sank
Beeswax	0.96 g	Floated
Brick	1.4 g	Sank
Cement	2.7 g	Sank
Cork	0.22 g	Floated
Granite	2.64 g	Sank
Marble	2.84 g	Sank
Paraffin	0.91 g	Floated

Your friend brags that she can predict which of the remaining cubes will sink and which will float. You challenge your friend that you can get more predictions right than she can. You make a data table like the one at the right for the remaining samples.

TABLE 2: Sinking/Floating Test Predictions

Sample Material	Mass of Cube	Predicted Results
Anorthite	2.74 g	
Balsa wood	0.14 g	
Charcoal	0.57 g	
Coal	1.4 g	
Diamond	3.52 g	
Dolomite	2.84 g	
Ebony wood	1.33 g	
Glass	2.4 g	
Peat	0.84 g	
Tar	1.02 g	
Sealing wax	1.8 g	

Predicting *(continued)*

Answer the following questions on a separate sheet of paper.

1. One way to predict which materials will float or sink is to use your knowledge and past experience. Make as many predictions as you can about the materials listed in Table 2 on page 14. Give your reason for each prediction.

2. Examine the information provided in Table 1 on page 14. Try to find a pattern indicating why some cubes floated and some sank. Write down any pattern you find. (*Hint:* You could make two new data tables, listing the materials that floated in one table and the materials that sank in the other table.)

3. Use the pattern you found in Question 2 to predict which of the remaining sample materials will float and which will sink.

4. Do any of your predictions from Question 3 contradict your predictions from Question 1? If so, which one(s)? Which of the two different predictions do you now think is right? Explain.

5. Think About It You have probably observed that ice cubes float in water. Write a prediction stating the mass of an ice cube 1 cm on each side. Explain your prediction.