Name _____ Date _____ Class _____

SKILLS INTRODUCTION

Drawing Conclusions

Suppose that you have a portable radio with headphones. One day you turn the radio on, but you don't hear your favorite station. You try other stations and still get no sound. You think that the batteries must be dead, so you put in new ones. Still there is no sound. You try replacing your headphones with ones from your sister's radio. Your favorite music is back! You draw the conclusion that there was something wrong with your headphones.

In everyday language, the word "conclusion" means an explanation or interpretation of an observation or a statement. In science, the word "conclusion" usually has a more limited meaning. **Drawing a conclusion** means making a statement summing up what you have learned from an experiment.

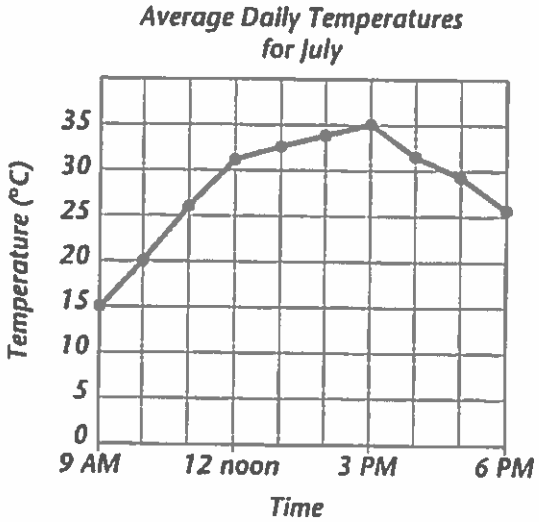
The conclusion of an experiment is usually related to the hypothesis. You may recall that a hypothesis is an prediction made about the outcome of an experiment. After you have carried out the procedure, made and recorded observations, and interpreted the data, you can finally determine whether your experiment showed your hypothesis to be true or false.

Suppose that Leon and Jobelle each write a hypothesis about the summer temperatures where they live.

Example 1: Leon writes,

Example 2: Jobelle writes,

They then test their hypotheses by measuring the outdoor temperature several times a day for the month of July. Then they average their data and graph the data as shown at the right.



Name _____ Date _____ Class _____

Drawing Conclusions

From the graph, Leon can see that the results of the investigation do not support his hypothesis. He draws this conclusion:

The results do support Jobelle's hypothesis, however. She draws the following conclusion:

Before scientists become confident of their conclusions, they often repeat their experiments many times and compare their work with that of others. Additional experiments may provide further support for a particular hypothesis. Alternatively, they may cause a researcher to revise or replace the hypothesis.

Tips for Drawing Conclusions

- Refer to the hypothesis for your experiment.
- Review the observations in your experiment. Analyze the data, completing whatever calculations or graphs will help you identify trends or patterns in your results.
- Determine whether your data support your hypothesis or suggest that it is false. Write a statement summing up what your results show.
- Consider whether you might plan other experiments to support your conclusion or compare your work with that done by other researchers.

☑ Do you think Jobelle can use the data to draw a conclusion about daily temperature changes that occur at other times of the year? Explain.

Name _____ Date _____ Class _____

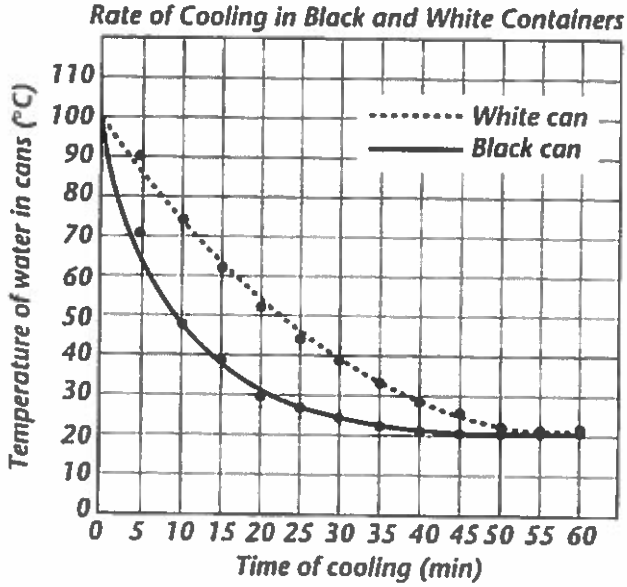
SKILLS PRACTICE

Drawing Conclusions

Olena and Bruce are studying whether the color of a container affects how fast the container cools down. Olena wrote this hypothesis:

Bruce wrote this hypothesis:

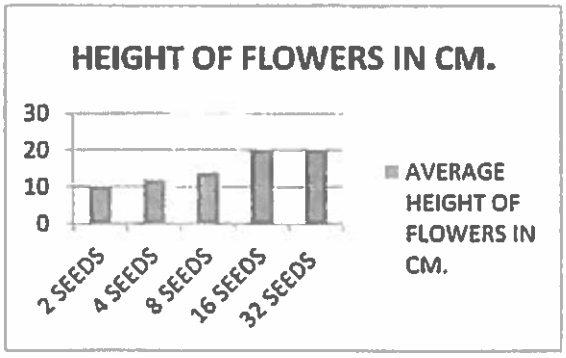
They then tested their hypotheses. Here is their graph.



1. Examine the data presented in the graph. Notice the temperatures of the black and white cans at the times the measurements were taken. What does this data tell you about the way the two cans cooled down?
2. Compare the evidence in the graph with Olena's hypothesis. What conclusion should Olena draw?
3. Compare the evidence in the graph with Bruce's hypothesis. What conclusion should Bruce draw?
4. Neither Bruce or Olena included anything about the cans' final temperatures in their hypotheses. Rewrite one of their conclusions to include information about the final temperatures of the cans.
5. **Think About It** Who do you think learned more about temperature changes: Bruce or Olena? Does it make any difference if one person's hypothesis was shown to be false? Explain.

Scenario 4 Plant Competition

Juanita would like to get the tallest flowers possible. She typically plants 2 seeds in each pot, but she has heard that plants will compete with each other in crowded spaces. She thinks that the more seeds she adds the higher the plants will grow. She decides to see what affect crowding will have on her flowers' height. She took 5 plastic cups and filled them with 150 grams of soil. In the first cup she planted 2 seeds, in the second cup she planted 4 seeds, in the third cup 8 seeds, and in the fourth cup she planted 16 seeds. In the last cup she planted 32 seeds. After 25 days, she determined which set of flowers were the tallest.

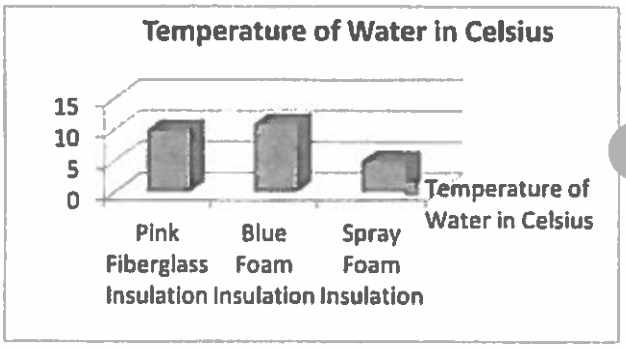


What would be a good conclusion?_____

_____

Scenario 5 Insulating a House

Latasha became interested in insulation while her parent's new house was being built. Her parents wanted to go with the traditional pink fiberglass insulation, Latasha thought they should explorer their options. Latasha decided to run an experiment using 3 different types of insulation and see which one transferred the least heat. She believes that the spray foam will keep the water the warmest. She filled each of 5 jars half-full with water that was 5 degrees Celsius. She sealed each jar with a plastic lid. Then she wrapped each jar with a different kind of insulation. She put the jars outside in the direct sunlight. Later, she measured the temperature of the water in each jar.



What would be a good conclusion?_____

_____

Scenario 6 Eat Your Veggies

For years John Glenn Middle School has had only one option for vegetables in their line and students haven't typically chosen them. John Glenn Lunch Service is interested in seeing what affect offering a greater selection of vegetables has on the amount of students that take them. They think that the number of offerings won't increase the amount taken by students. They decide that during the first month they will offer one vegetable, during the second 2, and during the third month 3 choices. The results are show in the chart to the right.

	1 vegetable offered	2 vegetables offered	3 vegetables offered
Number of Student that Took a Serving	50	50	50

What would be a good conclusion?_____