Chapter Science Investigation   Name _____

Gathering Global Weather Data

What You Need

map of the world showing
major cities

Internet or daily
newspaper

Find Out

Do this activity to see what
the weather conditions are
like in different biomes
around the world.

Process Skills

Predicting
Observing
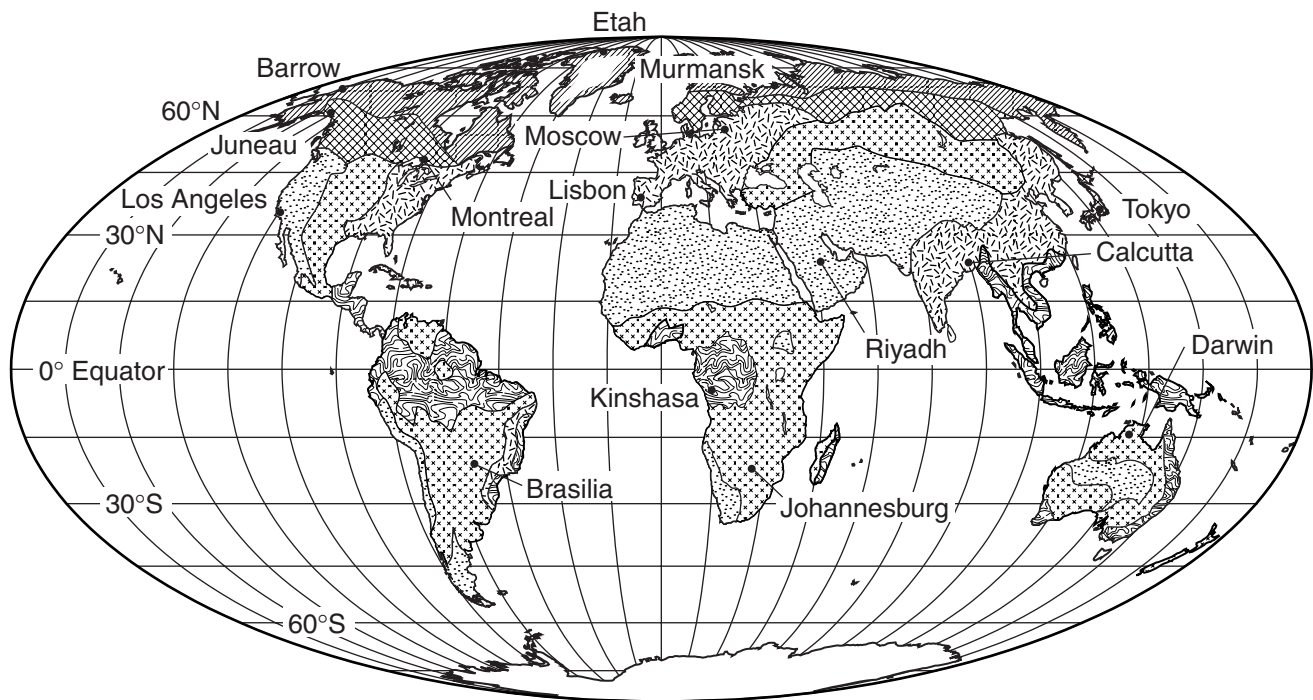Using Numbers
Interpreting Data
Communicating

Time

- 30 minutes the first day
- 10 minutes each day for
  two weeks
- 30 minutes the last day of
  the second week

WHAT TO DO

1. The map below shows the distribution of Earth's six major terrestrial biomes. Select one major city from your world map that fits each biome and **record** it.

2. Based on what you learn about conditions in the different biomes, **predict** what the average daily temperature and precipitation conditions will be for each city you selected for the next two weeks.

3. Each school day for the next two weeks, **record** the amount of precipitation for each city on Table 1. **Record** the high and low temperatures for each city on Table 2. You can get this information from either a major daily newspaper or the Internet.

4. When you finish, compare your **observations** with your predictions. How close were you?

5. **Compare** the results of your study with those of your classmates.

Etah
Barrow
Murmansk
60°N
Juneau
Moscow
Lisbon
Los Angeles
Montreal
Tokyo
30°N
Calcutta
Riyadh
Darwin
0° Equator
Kinshasa
Brasilia
30°S
Johannesburg
60°S

Tundra   Taiga   Grassland   Deciduous Forest   Desert   Tropical Rain Forest

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Table 1. Precipitation of World Biomes

Biome	Tundra	Taiga	Grassland	Desert	Deciduous Forest	Tropical Rain Forest
City						
Day 1						
Day 2						
Day 3						
Day 4						
Day 5						
Day 6						
Day 7						
Day 8						
Day 9						
Day 10						
Predicted Average Precipitation						
Actual Average Precipitation						

Table 2. Temperatures of World Biomes

Biome	Tundra			Taiga			Grassland			Desert			Deciduous Forest			Tropical Rain Forest		
City																		
Temperature	High	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg
Day 1																		
Day 2																		
Day 3																		
Day 4																		
Day 5																		
Day 6																		
Day 7																		
Day 8																		
Day 9																		
Day 10																		
Predicted Average Temperature																		
Actual Average Temperature																		

Conclusions

1. How do your results match what you know about the climate of each biome?
Answers will depend on data collected. Students should find that their predictions about temperatures and amount of precipitation for each biome were fairly accurate; however, a two-week study may not be long enough to distinguish among all biomes.

2. How were the results of your study similar to those of your classmates?
Answers will depend to some extent on data and cities studied, but results for each biome should be similar.

New Questions

1. Suppose you were planning to go on a vacation next week. Which of your cities would you want to visit? How could you get ready for your trip?
Answers will vary. Students could use their results and look up more weather information on the Internet, and should pack appropriately for the season and climate.

2. In general, latitude, height above sea level, and amount of precipitation determine a terrestrial location's biome. What kind of biome would you expect to find in a low-lying area near the equator that gets lots of rain? Why?
a tropical rain forest, because the year-round warm temperatures, high humidity, and plentiful rainfall create conditions ideal for abundant growth of a variety of plants

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ACTIVITY

Counting Populations

Draw a diagram of your group's plot. **Identify** any physical features such as rocks, trees, or pavement.
Diagrams should be representative of the area you assign to students.

Record your findings in the chart below and **map** them on the diagram above.

	Number of Plants	**Number of Animals**
Square 1	Answers will vary based on location.	
Square 2		
Square 3		
Square 4		
TOTAL		

Name _____

Conclusions

1 How were the organisms distributed in your plot? Was this different from the plots your classmates studied?
Answers will vary. Some students may have only one plant; others may have many.

2 Did you see evidence of animals, without actually seeing them? If so, what was the evidence?
Answers will vary. Plots may contain partially eaten food or footprints.

Asking New Questions

1 What are some factors that might make the number of plants or animals go up or down if you sampled the same area next week or next month?
Some factors that might affect the number of plants and animals are the amount of sunlight, rainfall, and food and the presence of other organisms.

2 Why is the class average a better estimate of the number of plants or animals in an area than just one plot?
The test sample is larger. One plot may have an unusual number of plants or animals.

Name _____

ACTIVITY

Modeling a Biome

Write a paragraph about your biome. Include information about the climate and identify major plants and animals. Imagine an organism that would be successful in this biome. Include a description of the organism in your paragraph. What factors in your biome would help the organism survive?

Student paragraphs can be assessed for scientific and grammatical accuracy.

Make a drawing of your organism to accompany your paragraph. Student organisms may be quite fanciful.

Name _____

Conclusions

1 What factors led you to include certain plants or animals?
Answers should mention some abiotic factors such as soil, latitude, climate, sunlight, or geographical features.

2 **Explain** how the kind of plants in your biome determine the kinds of animals.
Answers will vary but should indicate an understanding that the kinds of plants provide food and shelter for the animals.

Asking New Questions

1 If the climate changed in your biome, what would happen to the plants and animals that live there?
Answers will vary but should include recognition that most plants and animals would die.

2 How could a species of animal inhabit more than one biome?
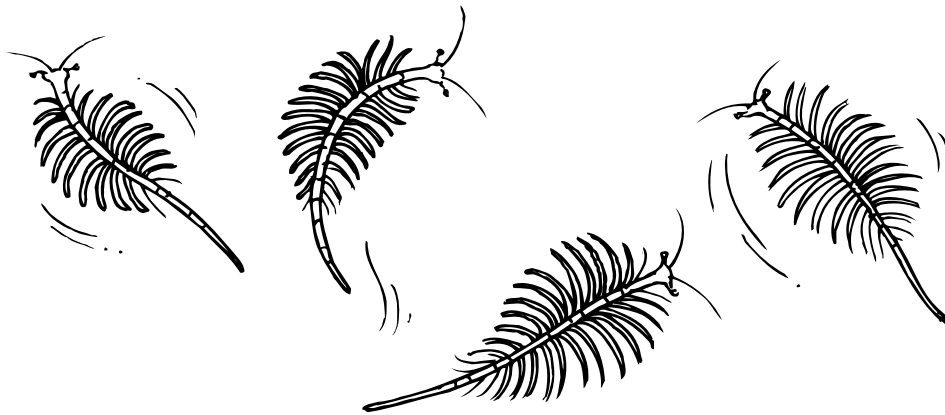If the climate and other abiotic features of two biomes were similar, an animal could inhabit both.

Name _____

ACTIVITY

Testing Factors

Draw a sketch of your brine shrimp below.

Record your **predictions** and **experimental results** of the brine
shrimp reactions in the chart below.

	How Do You Predict the Brine Shrimp Will React?	How Did the Brine Shrimp React?
Light	Accept all reasonable responses.	moved toward it
Warm Temperatures		moved toward it
Cold Temperatures		moved away from it

Name _____

Conclusions

(1) How did the shrimp respond to light?
The shrimp moved toward the light.
To cold water?
They moved away from cold water.
To warm water?
They moved toward warm water.

(2) Based on your observations, were your predictions correct?
Answers will vary.

(3) What did the shrimp eat?
yeast

(4) What was the energy source for the environment in the jar?
the sun

(5) Why was it important not to cover the jar?
Brine shrimp need oxygen for respiration.

Asking New Questions

(1) What physical conditions in the jar are similar to those in the
ocean? What conditions are different?
Like the ocean, the jar contained salt water and oxygen and received light. The food source in the
jar was different from the food source in the ocean.

(2) Make a **list** of the environmental factors brine shrimp need to live.
food, salt water, oxygen, light, and the right temperature

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