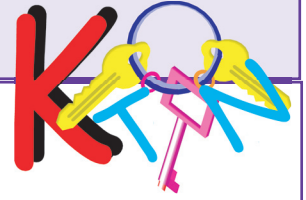


California Content Standards — Grade 6

- 1a. Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.

Key Words:






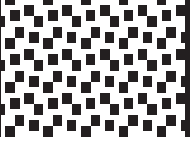

Continent	A continent is a large landmass. Earth has seven continents.
Continental Drift	Continental drift is the hypothesis that continents on Earth move slowly across the planet's surface.
Pangaea	Pangaea is the name of a large supercontinent that broke apart into the continents on Earth today.
Supercontinent	A supercontinent is a continent that is much larger than most continents and that forms as smaller continents come together.
Climate Zone	A climate zone is a region of Earth that has a relatively stable pattern of temperature and precipitation.
Hypothesis	A hypothesis is an educated guess that can be tested by doing experiments or making observations.

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Student Exercise

Suppose that you have traveled to the faraway planet shown on the next page. This planet is much like Earth. It has plates that move, plants and animals, water oceans, and different climate zones. As base scientist, you have the job of putting the continents together to show the supercontinent that once existed here. Cut out each continent from a copy of this page. Then use the clues to complete your job.

Key to Symbols

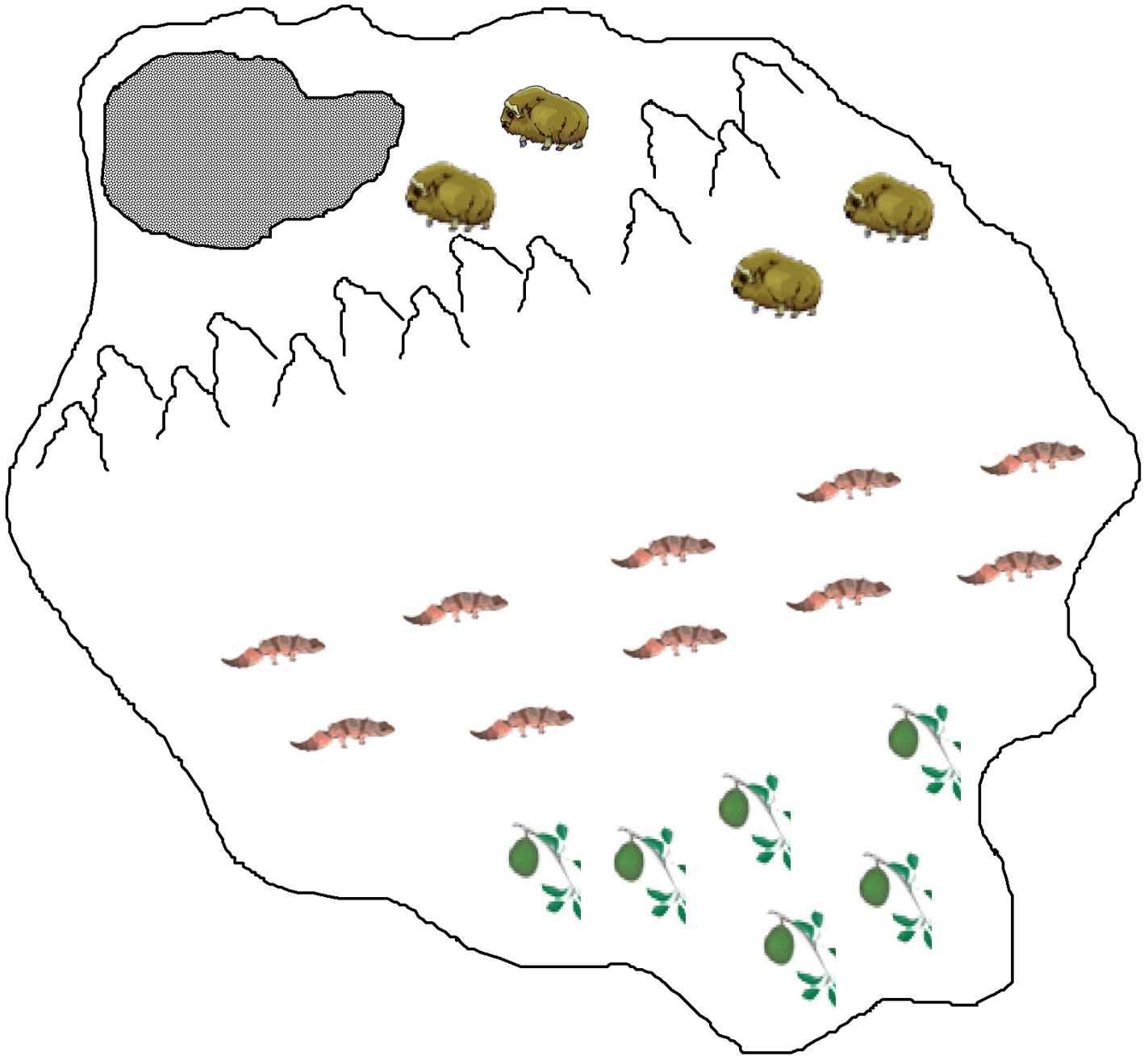
	Fossil bones and eggs from a fin-tailed, reptile-like animal that lived in tropical climates
	Bones and very rare imprints of hair from a large hairy ox that lived in cold climates
	Leaf, stem, and some rare fruit fossils from a plant that lived in the southern hemisphere
	Rock called tillite that formed beneath a glacier
	Mountain peaks

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Student Exercise

Answer: Student Exercise on page 9.



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Math Link:

Landmasses on Earth move about as fast as your fingernails grow, but this slow movement causes big changes over long periods of time. Use the equation below to calculate how much movement occurs.

$$\text{Distance (d)} = \text{rate (r)} \times \text{time (t)}$$

Example Problem

The island of Hawaii is moving northwest at about 11 centimeters per year. If it keeps moving at this speed, how far will the island move in one million years?

Write what you know: rate (r) = 11 centimeters per year

time (t) = 1,000,000 years

Put what you know into the equation:

$$\text{distance (d)} = (11 \text{ cm/yr}) \times (1,000,000 \text{ yr})$$

Solve the equation:

$$\begin{aligned} \text{distance (d)} &= (11 \text{ cm/yr}) \times (1,000,000 \text{ yr}) \\ &= 11,000,000 \text{ centimeters} \end{aligned}$$

Change the unit to kilometers:

$$\begin{aligned} \text{distance (d)} &= (11,000,000 \text{ cm}) (1 \text{ km}/100,000 \text{ cm}) \\ &= 110 \text{ kilometers} \end{aligned}$$

Try It

North America and Europe are moving apart at about 4 centimeters per year. If they keep moving at this rate, how much will they separate in five million years?

Answer: 200 kilometers

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Literacy Connection:

A biography is an account of a person's life that was written by a different person. Read this biography about Alfred Wegener. Then answer the questions.

Alfred Wegener and His Famous Hypothesis

Alfred Wegener (VEG uh nuhr) was born in Germany in 1880. As a young adult, he went to college and in 1905 earned his doctorate degree. His degree was in astronomy, the study of space and planets, but Wegener quickly became interested in weather, climate, and the solid earth.

In 1910, while looking at a map, Wegener noticed that Africa and South America look as if they could fit together. The next year, he read that fossils of the same kind occur on continents now separated by a wide ocean. Wegener explained these facts by suggesting that the continents once were all together in a giant supercontinent, called Pangaea. The supercontinent then broke apart, and the continents slowly moved to their present locations. This hypothesis is called continental drift. Unfortunately, Wegener could not explain how continents could move. For this reason, most scientists of his time did not believe him.

Alfred Wegener died in 1930. He was hiking over the large ice cap that covers most of Greenland and died from the cold or from a heart attack. Just more than three decades after his death, new evidence showed that Wegener was right. The continents drift after all.

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Literacy Connection:

Questions

1. What did Alfred Wegener suggest?

The highest values on the scale are rarely observed because very large earthquakes occur infrequently.

2. Why did most other scientists of the time disagree with Alfred Wegener?

Factors include the distance from the epicenter and the type of bedrock or sediment beneath the region.

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Test Practice Questions:

1. What is the name of the supercontinent that broke apart into the present continents?
 - A. Nena
 - B. Pangaea ✓
 - C. Rodinia
 - D. Columbia

2. Why did Alfred Wegener have a hard time getting other scientists to believe in continental drift?
 - A. He had very little evidence that continents had moved.
 - B. He was too sick to tell people about his ideas.
 - C. He used maps that were drawn incorrectly.
 - D. He could not explain how continents could move. ✓

3. How fast do continents usually move?
 - A. a few millimeters each year
 - B. a few centimeters each year ✓
 - C. a few meters each year
 - D. a few kilometers each year

4. Which type of climate usually exists along Earth's equator?
 - A. cool and dry
 - B. cool and wet
 - C. warm and wet ✓
 - D. warm and dry