حل تجميعة أسئلة مراجعة عامة وفق الهيكل الوزاري منهج انسباير

تاريخ إضافة الملف على موقع المناهج: 2024-11-26 11:19:22

المزيد من مادة علوم:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

إعداد: Salahuddien Zahra

التواصل الاجتماعي بحسب الصف الرابع

صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الرابع والمادة علوم في الفصل الأول

1	حل مراجعة عامة وفق الهيكل الوزاري منهج انسباير
2	مراجعة عامة وفق الهيكل الوزاري منهج انسباير
3	حل مراجعة نهائية وفق الهيكل الوزاري منهج انسباير
4	مراجعة نهائية وفق الهيكل الوزاري منهج انسباير
5	حل أسئلة مراجعة وفق الهيكل الوزاري منهج بريدج

End of term 1 Exam preparation

Science Grade 4

Al Sumow School

2024-2025

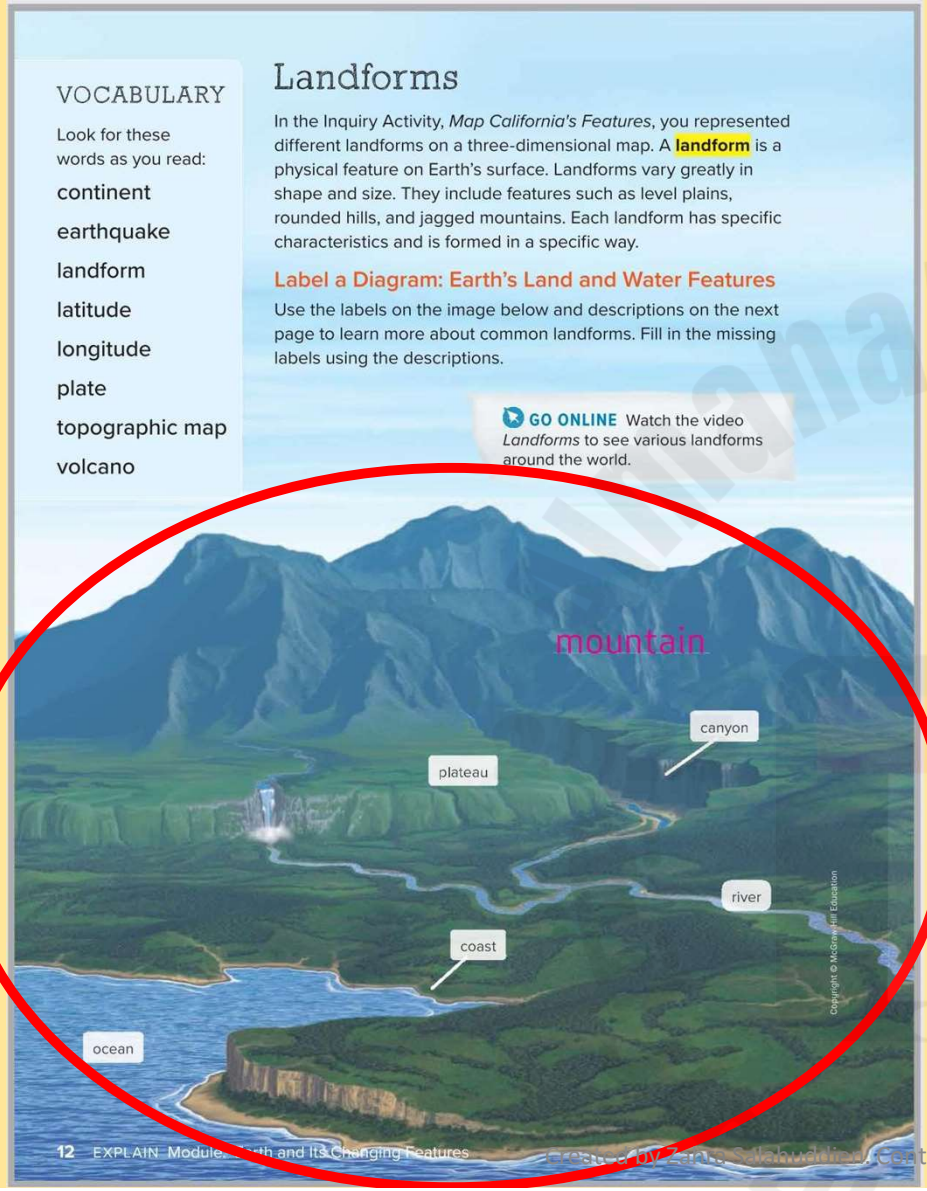
Created by Miss Zahra Salahuddien.
Contains images and questions from Inspire Platform

Structure of Exam

Number of MCQ عدد الأسئلة الموضوعية	15
Marks of MCQ درجة الأسئلة الموضوعية	60
Number of FRQ عدد الأسئلة المقالية	5
Marks per FRQ الدرجات للأسئلة المقالية	40

Multiple choice 4 marks each question

Written answer 8 marks each question



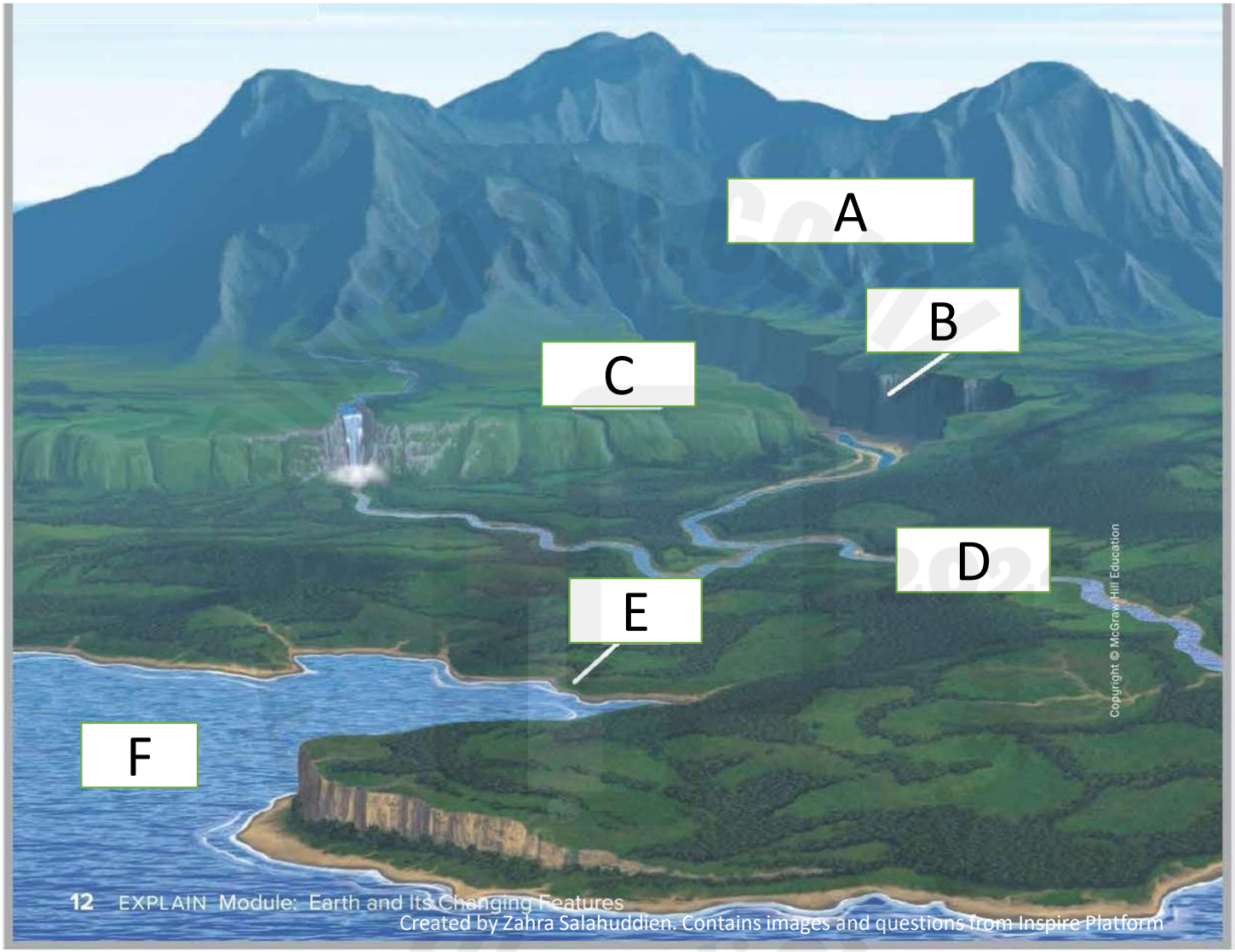
Q1: Figure 12 Page 12 U3M1L1

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features

Possible questions from U3 page 12

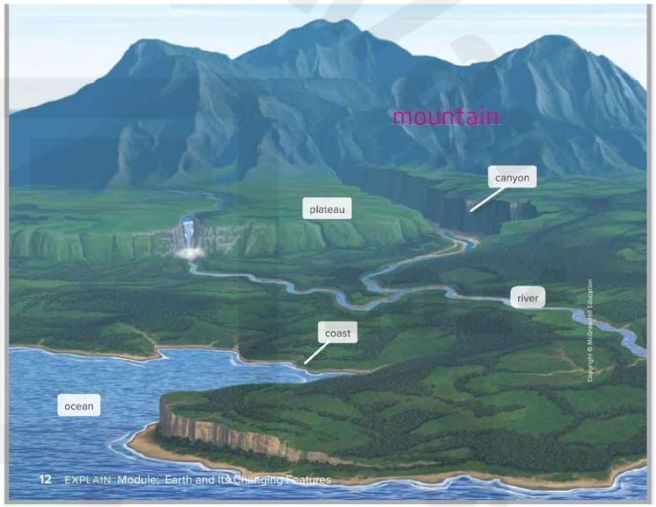
Identify the landforms in the figure by:

- Naming the numbered part or
- Description of landform provided



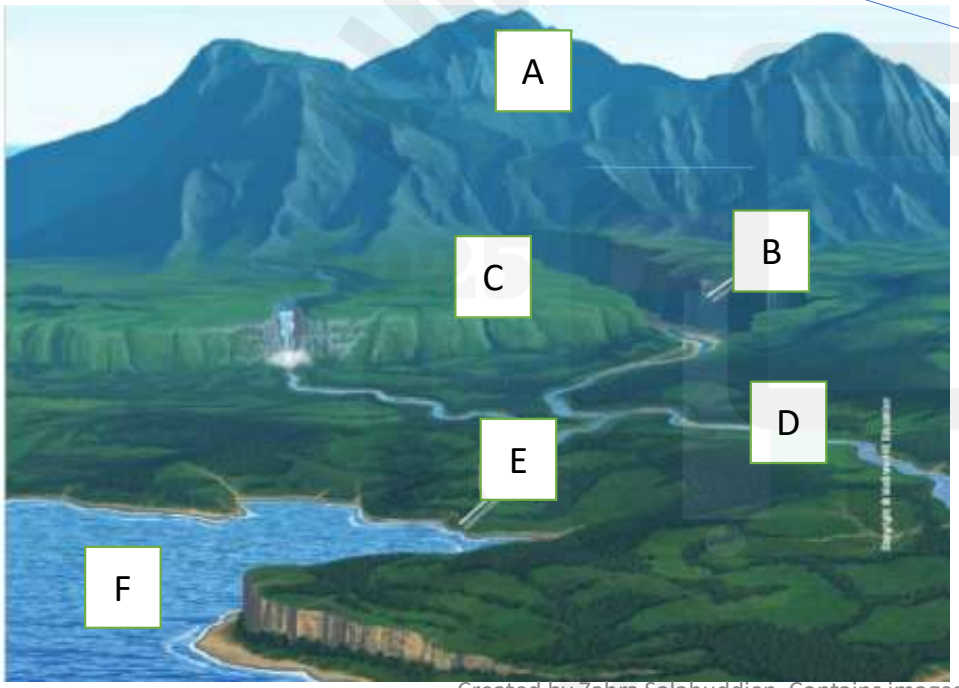
3) Plateaus, valleys, canyons, and mountains are all examples of _____.

- highlands
- mantle areas
- landforms
- hydrosphere



Possible questions from U3 page 12

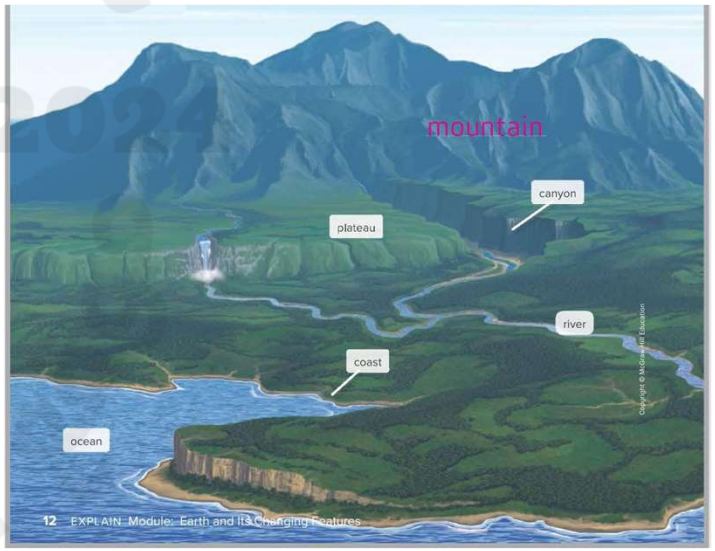
- What is a landform? **A physical feature on Earth's surface**
- What Letter shows this feature?

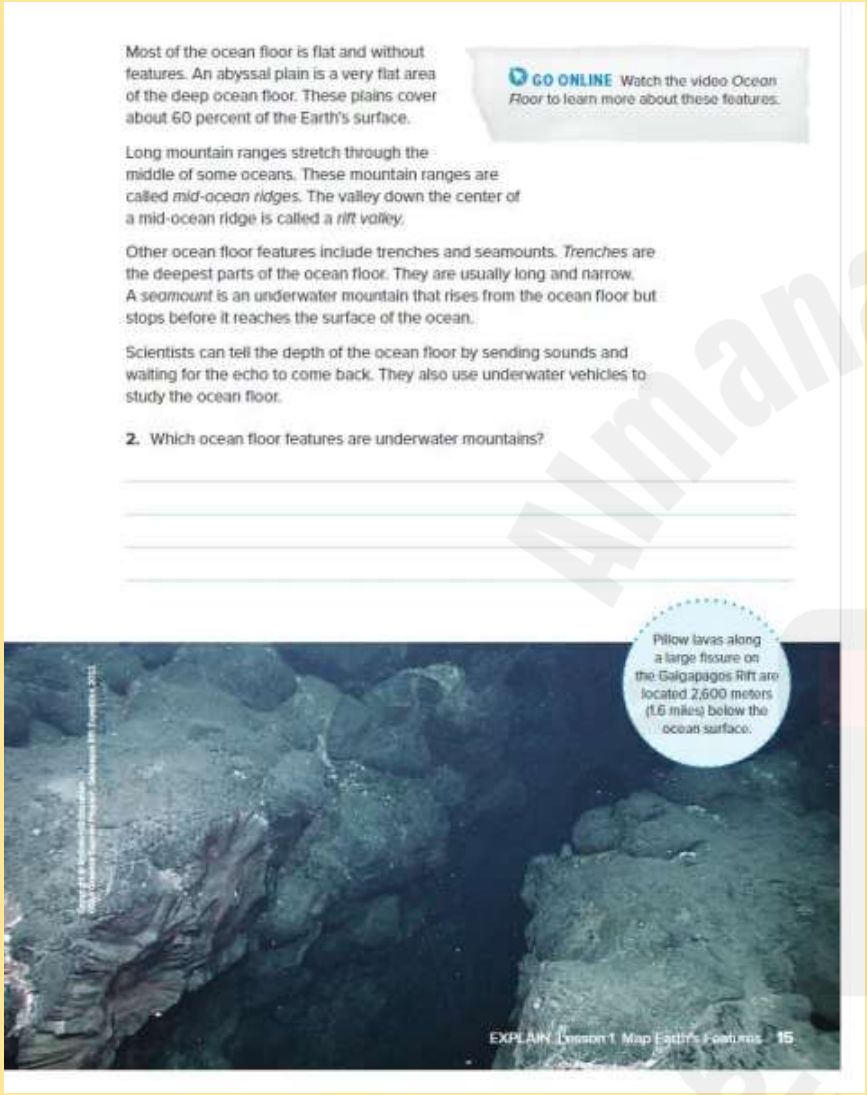


River **D**
Coast **E**
Plateau **C**
Mountain **A**
Ocean **F**
Canyon **B**

Possible questions from U3 page 12

1. A landform that rises high above the Earth's surface. **mountain**
2. A deep valley with high, steep side. **canyon**
3. Flat land that is higher than the land around it. **plateau**
4. A body of water meets land. **coast**
5. Natural body of moving water. **river**
6. A large body of salt water. **ocean**





Most of the ocean floor is flat and without features. An abyssal plain is a very flat area of the deep ocean floor. These plains cover about 60 percent of the Earth's surface.

GO ONLINE Watch the video *Ocean Floor* to learn more about these features.

Long mountain ranges stretch through the middle of some oceans. These mountain ranges are called *mid-ocean ridges*. The valley down the center of a mid-ocean ridge is called a *rift valley*.

Other ocean floor features include trenches and seamounts. *Trenches* are the deepest parts of the ocean floor. They are usually long and narrow. A *seamount* is an underwater mountain that rises from the ocean floor but stops before it reaches the surface of the ocean.

Scientists can tell the depth of the ocean floor by sending sounds and waiting for the echo to come back. They also use underwater vehicles to study the ocean floor.

2. Which ocean floor features are underwater mountains?

Pillow lavas along a large fissure on the Galapagos Rift are located 2,600 meters (1.6 miles) below the ocean surface.

EXPLAIN Lesson 1 Map Earth's Features 15

Q2: Page 15
U3M1L1

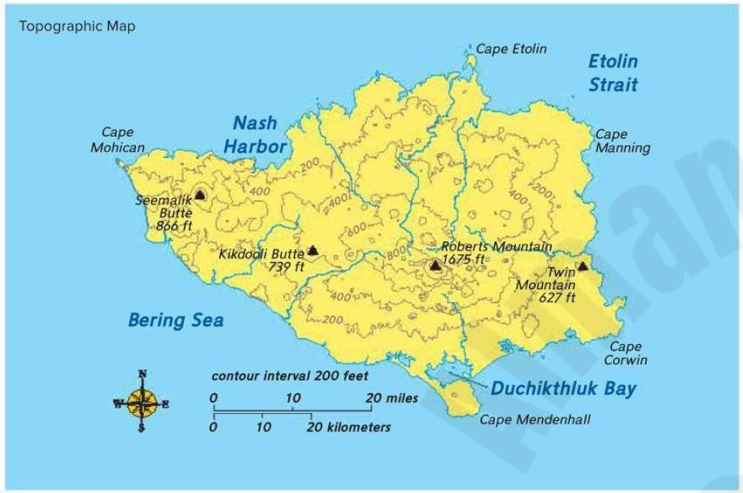
4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features

4-ESS1-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

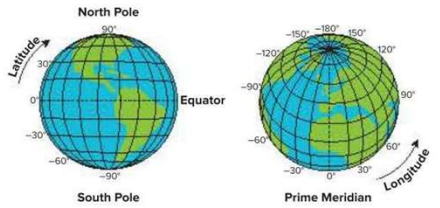
Possible questions from U3 page 15

- What feature covers most of the ocean floor? Abyssal plain (most of the ocean is flat)
- What is the flattest part of the ocean floor? Abyssal plain
- Which ocean floor features are underwater mountains? Seamounts and mid-ocean ridges.
- What do we find between mid-ocean ridges? Rift valley
- What is the deepest part of the ocean floor? Trench
- How do scientists study the ocean floor? They use echoes

A **topographic map** shows the elevation of an area using lines. Each line is labeled with a number. Contour lines that are close together represent a rapid change in elevation. Contour lines that are far apart represent a gradual change in elevation.



Scientists can use maps to identify patterns in the locations of landforms and other features. The locations of certain features can be described using a coordinate system such as latitude and longitude. **Latitude** is used to describe how far north or south a place is from the equator. **Longitude** is used to describe how far east or west a place is from the Prime Meridian. Latitude and longitude lines form a grid across the globe.



Q3 and 4: Page 17
U3M1L1

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features

Possible questions from U3 page 17

- What map uses lines to show elevation? Topographic map
- What do close lines on contour map show? Rapid change in elevation/land slope is steep
- What do lines far apart on contour map show? gradual change in elevation/land slope is gentle
- What lines show how far north or south of the equator something is? latitude
- What lines show how far east or west of the prime meridian something is? longitude

5) Which shows the elevation of an area using contour lines?

- ○ mountains
- ○ faults
- ○ topographical map
- ○ cartographer

10) For which landform would contour lines be closest together on a topographical map?

- ○ a sand dune
- ○ a plateau
- ○ a hill
- ○ plains

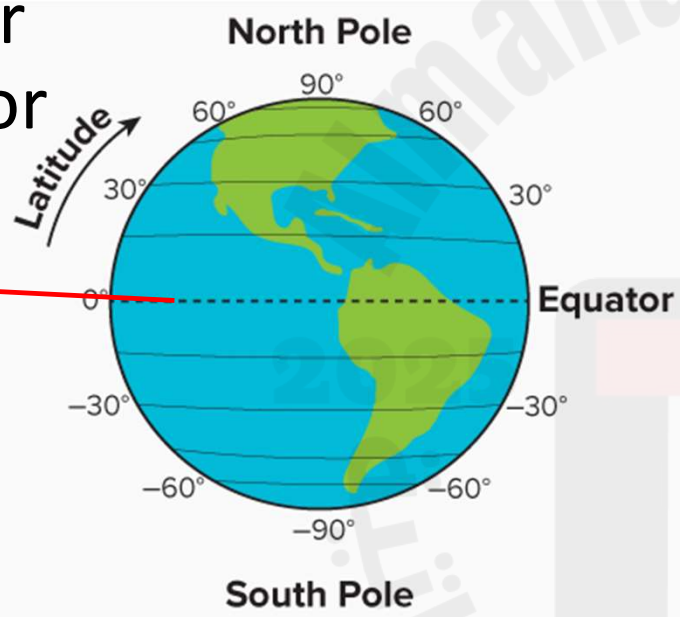
topographic map

Show the elevation of an area using lines

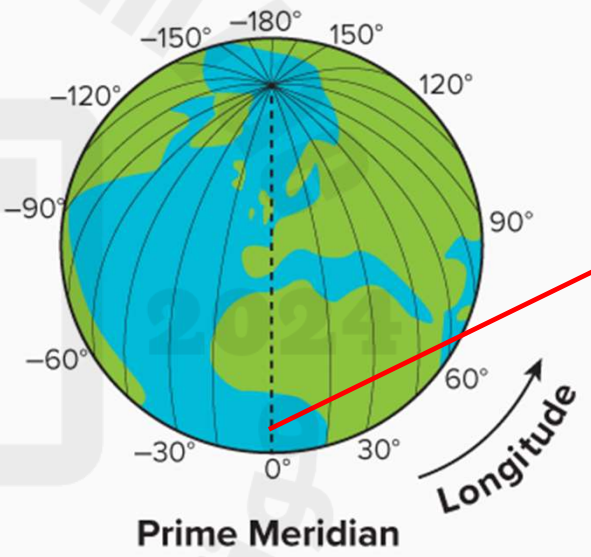
Elevation is how high land is above the sea

latitude

How far North or south from

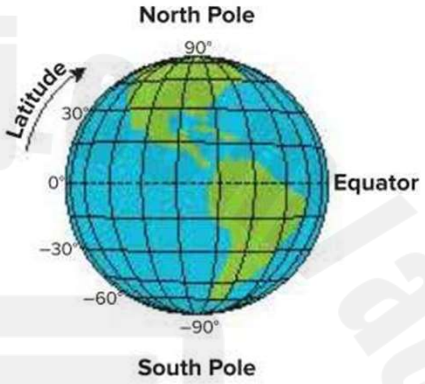


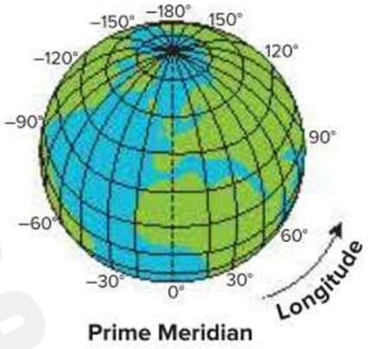
longitude



How far east or west from

Possible questions from U3 page 17 figures





1. What type of map is shown in the picture?
2. What type of map uses lines to show elevation?

topographic map

3. What **lines** show how **far north or south** of the **equator** something is?

latitude

4. What **lines** show how **far east or west** of the **prime meridian** something is?

longitude

Tension, or forces that pull things apart, moves Earth's plates. Plates can also be moved by pushing forces. Mountains form when plates push together or past each other along plate boundaries. Many earthquakes and volcanoes also happen at plate boundaries.

A **volcano** is an opening on Earth's surface where melted rock or gases are forced out. Volcanoes can form on land or on the ocean floor, but they are located only in certain places on Earth's surface. Most volcanoes form at plate boundaries. For example, a ring of volcanoes called the *Ring of Fire* surrounds the Pacific Ocean. The Ring of Fire follows the boundaries of the plates that meet around the Pacific Ocean.

An **earthquake** is a sudden movement of Earth's crust. Like volcanoes, most earthquakes occur because of moving plates. Also, like volcanoes, earthquakes are most likely to occur near plate boundaries. You will learn more about earthquakes in the next module.

2. Describe the global patterns of volcanoes and earthquakes that are shown on the world map.

Both are likely to occur near plate boundaries.

Think about the ocean floor features from page 14. Some of these features, like ocean trenches, occur where two plates push together. Mid-ocean ridges occur where two plates spread apart. As the two plates move apart, new crust forms. The mid-ocean ridges are all connected and form the most extensive underwater mountain sytem on Earth.

3. Use the graphic organizer to classify the location of the following features: abyssal plains, earthquakes, mountains, volcanoes.

Near Plate Boundaries	Not Near Plate Boundaries
earthquakes, mountains, volcanoes	abyssal plains

Talk About It

Explain to a classmate where you would most likely find mountain ranges on the ocean floor.

Q 5: Page 19
U3M1L1

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

Possible questions U3 page 19

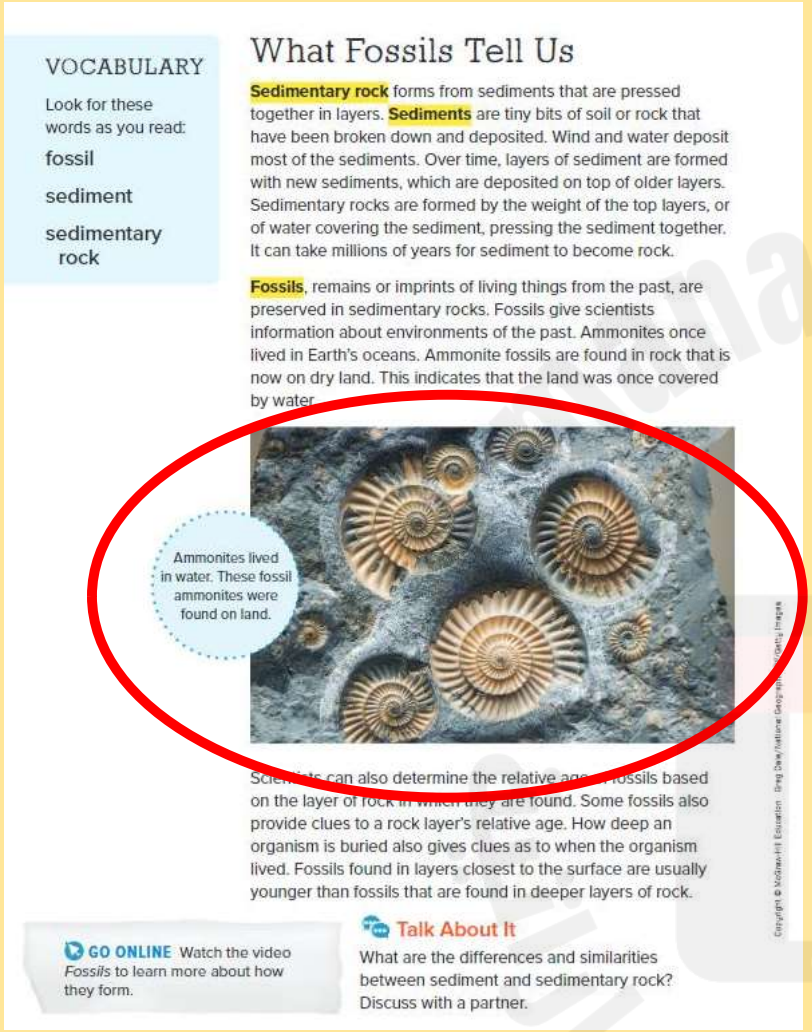
- What is a volcano? **An opening in Earth's surface where melted gas and rocks are forced out.**
- What is an earthquake? **A sudden movement of Earth's crust**
- Where do most volcanoes occur? **Along plate boundaries, like the ring of fire.**
- What type of plate motion forms mountains? **When plates push together**
- What type of plate motion forms mid-ocean ridges? **When 2 plates move apart.**

2. Describe the global patterns of volcanoes and earthquakes that are shown on the world map.

Both are likely to occur near plate boundaries.

3. Use the graphic organizer to classify the location of the following features: abyssal plains, earthquakes, mountains, volcanoes.

Near Plate Boundaries	Not Near Plate Boundaries
earthquakes, mountains, volcanoes	abyssal plains



VOCABULARY

Look for these words as you read:

fossil

sediment

sedimentary rock

What Fossils Tell Us

Sedimentary rock forms from sediments that are pressed together in layers. **Sediments** are tiny bits of soil or rock that have been broken down and deposited. Wind and water deposit most of the sediments. Over time, layers of sediment are formed with new sediments, which are deposited on top of older layers. Sedimentary rocks are formed by the weight of the top layers, or of water covering the sediment, pressing the sediment together. It can take millions of years for sediment to become rock.

Fossils, remains or imprints of living things from the past, are preserved in sedimentary rocks. Fossils give scientists information about environments of the past. Ammonites once lived in Earth's oceans. Ammonite fossils are found in rock that is now on dry land. This indicates that the land was once covered by water.

Ammonites lived in water. These fossil ammonites were found on land.

Scientists can also determine the relative age of fossils based on the layer of rock in which they are found. Some fossils also provide clues to a rock layer's relative age. How deep an organism is buried also gives clues as to when the organism lived. Fossils found in layers closest to the surface are usually younger than fossils that are found in deeper layers of rock.

GO ONLINE Watch the video *Fossils* to learn more about how they form.

Talk About It

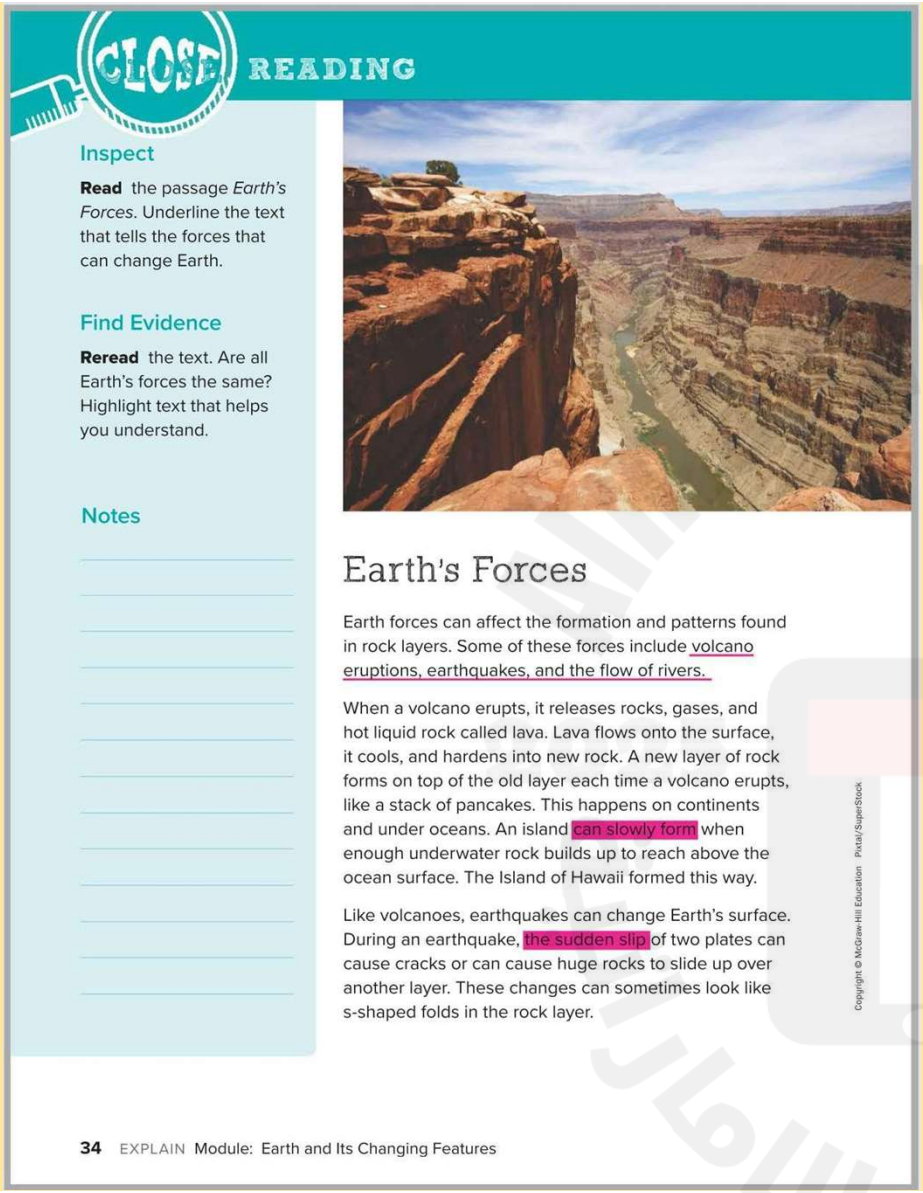
What are the differences and similarities between sediment and sedimentary rock? Discuss with a partner.

Q6: Page 32 U3M1L2 figure

- 4-ESS2-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Possible questions image U3 page 32 Unit 3

- What is shown in the image? Fossils
- What is a fossil? The remains or imprints of living things from the past
- What type of rock was it found in? sedimentary rock
- How can this fossil give clues about the past? It tells us the land was once covered in water. The environment has changed over time.
- Where do we find older fossils? Lower down



CLOSE READING

Inspect

Read the passage *Earth's Forces*. Underline the text that tells the forces that can change Earth.

Find Evidence

Reread the text. Are all Earth's forces the same? Highlight text that helps you understand.

Notes

Earth's Forces

Earth forces can affect the formation and patterns found in rock layers. Some of these forces include volcano eruptions, earthquakes, and the flow of rivers.

When a volcano erupts, it releases rocks, gases, and hot liquid rock called lava. Lava flows onto the surface, it cools, and hardens into new rock. A new layer of rock forms on top of the old layer each time a volcano erupts, like a stack of pancakes. This happens on continents and under oceans. An island can slowly form when enough underwater rock builds up to reach above the ocean surface. The Island of Hawaii formed this way.

Like volcanoes, earthquakes can change Earth's surface. During an earthquake, the sudden slip of two plates can cause cracks or can cause huge rocks to slide up over another layer. These changes can sometimes look like s-shaped folds in the rock layer.

Q7: Page 34 U3M1L2

- 4-ESS1-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Possible questions from U3 page 34

- Which forces change the earth **quickly/rapidly**?
- Volcano erupting and
- earthquakes.
- What does lava become when it cools? rock
- What can form an island over time? Volcano
- Do volcanoes form islands quickly or slowly? slowly
- What can cause s shaped folds in the rock layer? earthquake
- Do earthquakes change land quickly or slowly? quickly

Slow movements of Earth's plates can be very powerful too. When plates push together, they push up land. Over millions of years, these forces can form mountains. The Rocky Mountains, in Colorado, formed this way.

Water can interrupt rock layers by slowly removing rock particles. It slowly carves a gap in the layers, like when you cut and remove a piece of cake. Eventually a canyon forms. It took millions of years for the Colorado River to form the Grand Canyon.

Use evidence from each photo to support an explanation about how landscapes change over time.

Make Connections

Talk About It

Explain a cause and effect relationship from the text. Discuss with a partner.

Notes

REVISIT PAGE KEELEY SCIENCE PROBES Revisit the Page Keeley Science Probe on page 27.

Q: Page 35 U3M1L2

- 4-ESS1-1: Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Possible questions from U3 page 35

- Which forces change the earth **slowly**?
- Island forming from a volcano underwater,
- flow of rivers forming canyon,
- plates pushing up land to form mountains.
- How long does it take to form mountains? Millions of years
- How does water change the Earth's surface? Water can cut rock, forming canyons over millions of years.
- How do Earth's plates change the land ? Plates push together causing mountains to form over millions of years.

VOCABULARY

Look for these words as you read:

deposition

erosion

vegetation

weathering

Weathering

Recall the changes that you observed in the Inquiry Activity, *Shake, Rattle, and Roll.* You modeled weathering when you shook the jars. **Weathering** is the slow process that breaks down materials into smaller pieces. This process explains how rocks can change size and shape without changing their chemical properties.

Physical Weathering

Water can seep into cracks in a rock during warm weather. When the water freezes during cold weather, the water expands and makes the crack bigger. This process can also cause potholes and cracks in a road or sidewalk.

Abrasion is the action of rocks and sediments grinding against each other and wearing away surfaces. Abrasion can happen in many ways, such as when rocks and pebbles roll along the bottom of a river. Abrasion also occurs when rocks fall and tumble against one another. The force of the rocks hitting each other knocks off pieces of the rock. Wind causes abrasion. Sand blown by wind against exposed rock wears away the surface of the rock.

Rocks crashing together in a rockslide causes abrasion, a type of physical weathering.

Q9: Page 48 U3M1L3

- 4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Possible questions from U3 page 48

- What process breaks rocks? Weathering
- What process changes the size and shape of rocks without changing their chemical composition? Physical weathering
- How can water break rocks? Water seeps into cracks, freezes and forces the rock apart.
- How can abrasion (rocks bumping each other) break rocks?
- Water abrasion can cause rocks to hit each other in a river and break them.
- Wind abrasion can cause sand in the air to wear down rock surfaces.
- Gravity can cause rocks to fall and hit each other, causing them to break.

Many animals, like gophers, worms, and ants, can loosen and move soil and break apart rocks as they burrow in the ground. Plant roots can grow inside cracks in a rock and, over time, split the rock into pieces.

GO ONLINE Watch the video *Landscapes Change Over Time* to learn more about these processes.

The actions of living things, such as burrowing animals or growing plant roots, can cause weathering.

What type of force can cause abrasion?

Sample answer: The force of gravity can cause rocks to fall and cause abrasion.

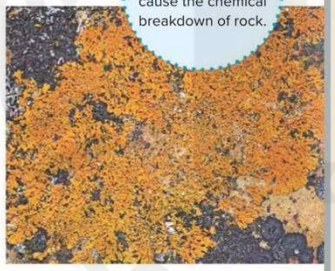
Chemical Weathering

Chemical weathering changes the minerals that make up rocks. Water, living things, and oxygen can cause chemical weathering.

Acids from natural sources, such as volcanoes, can make water more acidic. These acids can speed the breakdown and weathering of rocks.

Iron combines with oxygen in the presence of water to form rust. Rocks that contain iron can rust. Rust makes rock soft and crumbly.

Plant roots give off a weak acid as they grow. Lichens, plant-like organisms that grow on rocks, also produce weak acids. Lichens are important to soil formation in cold climates.



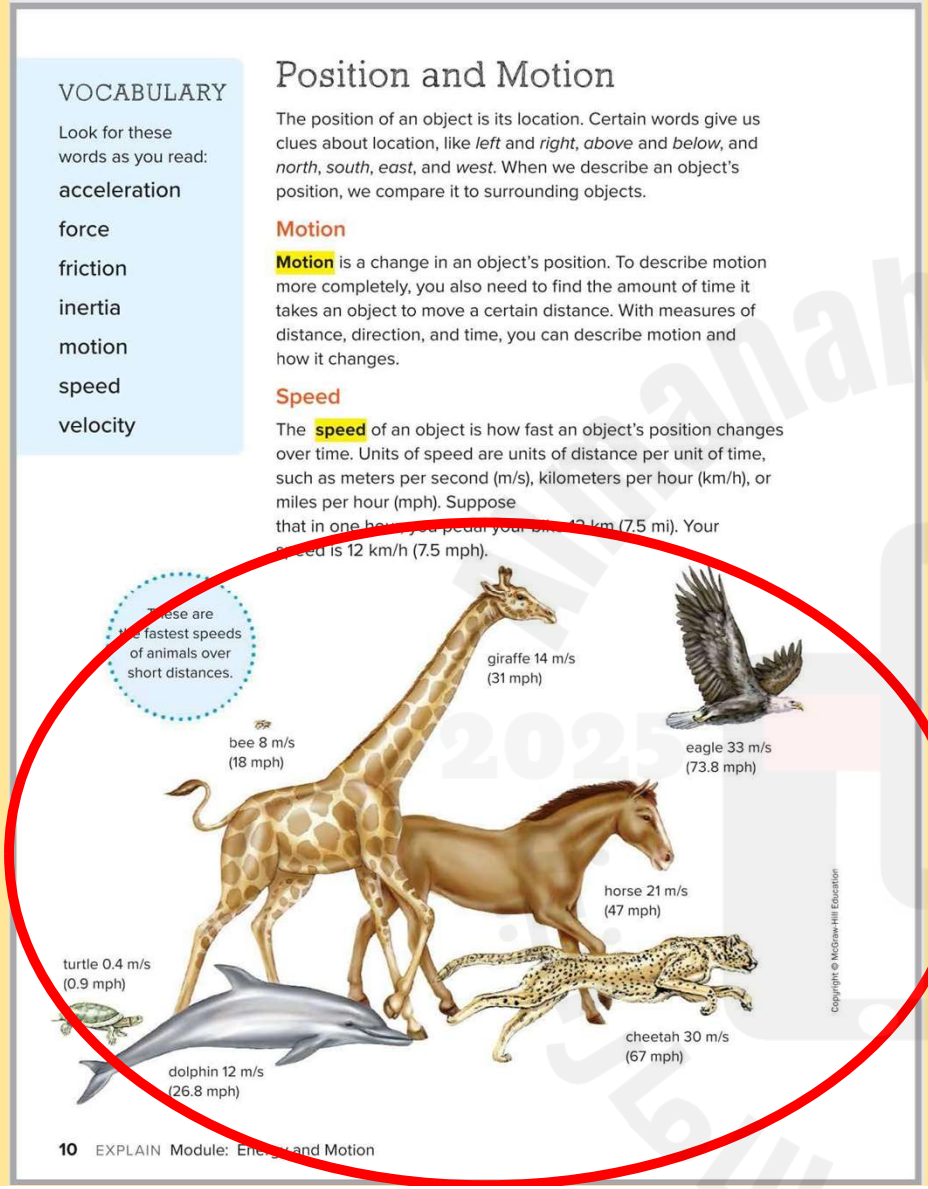
Lichens produce acids that help cause the chemical breakdown of rock.

Q10: Page 49 U3M1L3

- 4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Possible questions from U3 page 49

- What type of force can physically break rock? Animals activity and plant roots
- What type of force can cause abrasion? gravity
- What type of weathering changes rocks? Chemical weathering
- What can cause chemical weathering? Acids, living things and (oxygen + iron +water = rust)
- What are examples of things that cause chemical weathering? Acid from volcano and lichens, rust.



VOCABULARY

Look for these words as you read:

acceleration
force
friction
inertia
motion
speed
velocity

Position and Motion

The position of an object is its location. Certain words give us clues about location, like *left* and *right*, *above* and *below*, and *north*, *south*, *east*, and *west*. When we describe an object's position, we compare it to surrounding objects.

Motion

Motion is a change in an object's position. To describe motion more completely, you also need to find the amount of time it takes an object to move a certain distance. With measures of distance, direction, and time, you can describe motion and how it changes.

Speed

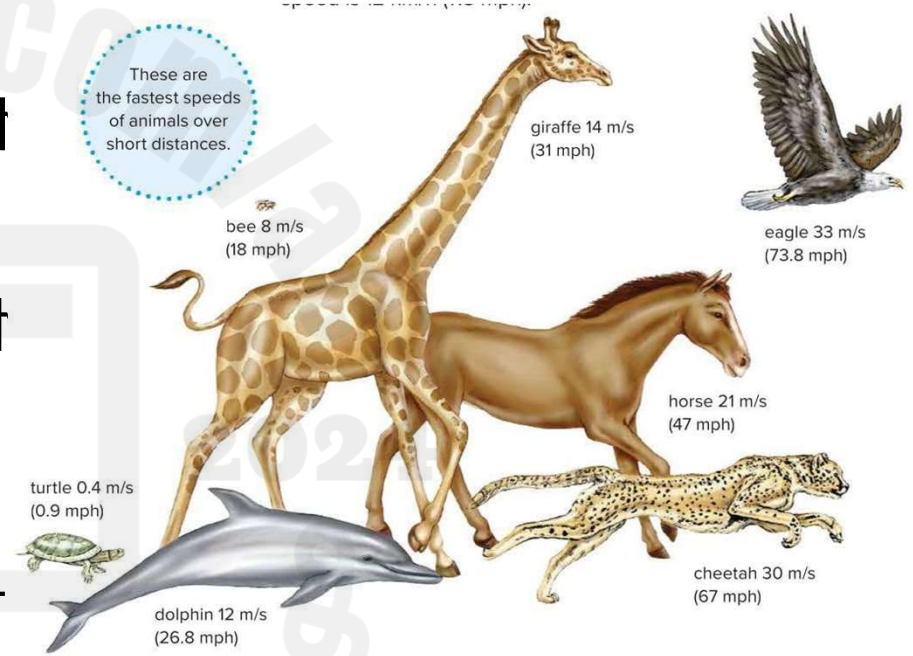
The **speed** of an object is how fast an object's position changes over time. Units of speed are units of distance per unit of time, such as meters per second (m/s), kilometers per hour (km/h), or miles per hour (mph). Suppose that in one hour, you pedal your bike 12 km (7.5 mi). Your speed is 12 km/h (7.5 mph).

Q11: Figure Page 10 U1M1L1

- 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

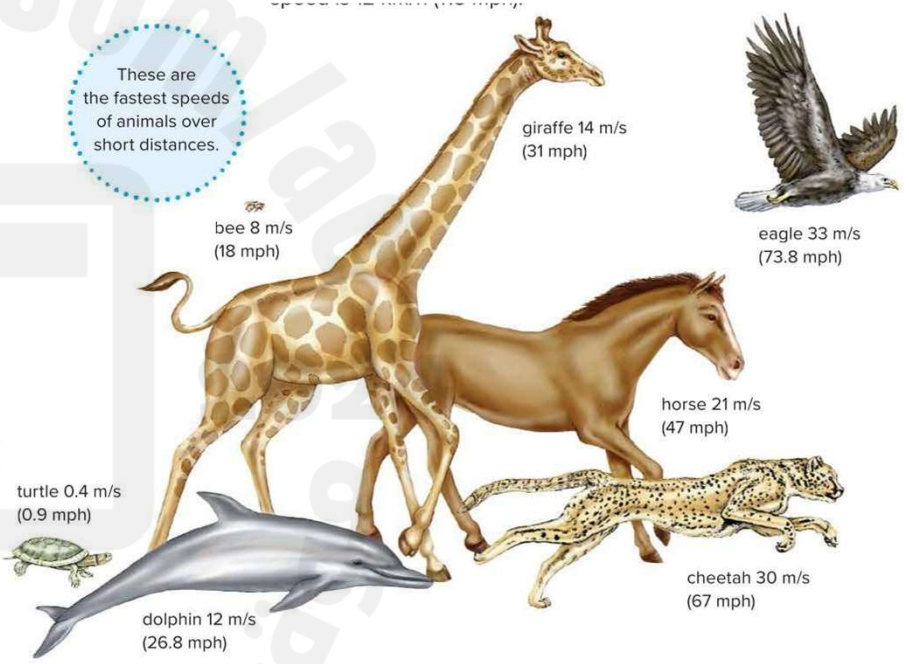
Possible questions about U1 figure page 10

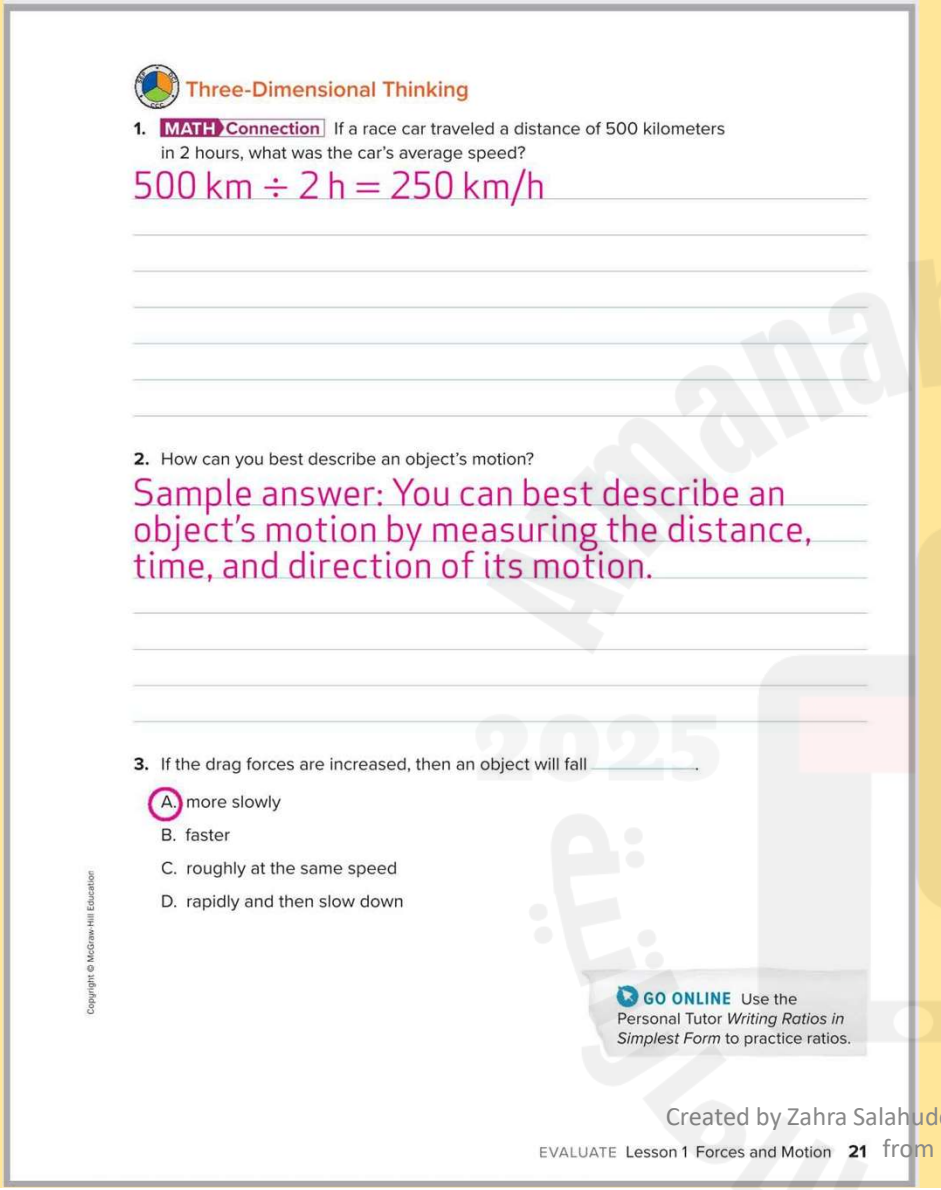
- Which animal is fastest?
- **eagle**
- Which animal is the slowest
- **turtle**
- Which animal has the most energy?
- **eagle**
- Which animal has the least energy?
- **turtle**



Possible questions about figure page 10

- Which animal has a speed of 21 m/s?
- **horse**
- What is the speed of the giraffe?
- **14 m/s or 31 mph**
- What do the numbers in th picture represent?
- **speed**





Three-Dimensional Thinking

1. **MATH Connection** If a race car traveled a distance of 500 kilometers in 2 hours, what was the car's average speed?

500 km ÷ 2 h = 250 km/h

2. How can you best describe an object's motion?

Sample answer: You can best describe an object's motion by measuring the distance, time, and direction of its motion.

3. If the drag forces are increased, then an object will fall _____.

A. more slowly
B. faster
C. roughly at the same speed
D. rapidly and then slow down

GO ONLINE Use the Personal Tutor *Writing Ratios in Simplest Form* to practice ratios.

Q 12 and 13: Page 21 U1M1L1

- 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

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Possible questions about U1 figure page 21

- Calculate speed: a racecar travels 500km in 2 hours, what is the cars average speed?

500 ÷2 = 250km/h

- What cannot be used to describe an objects motion?

a) Distance
b) Time
c) Direction
d) Temperature

Possible questions about U1 figure page 21

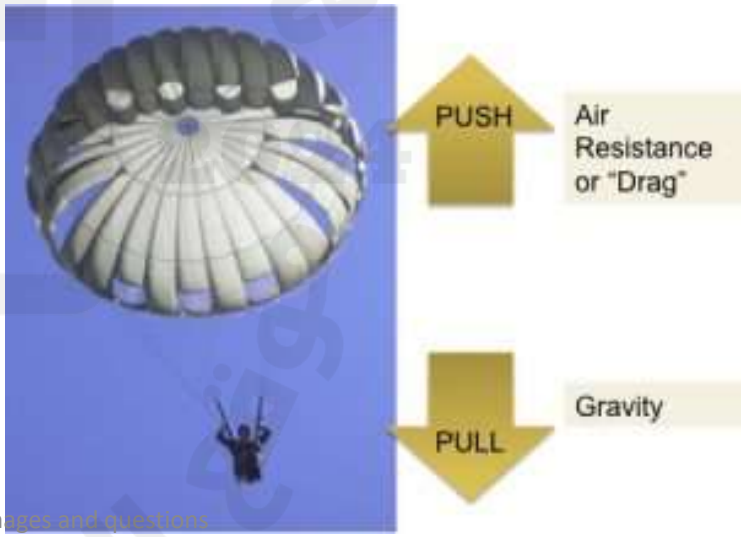
3. If the drag forces are increased, then an object will fall _____.

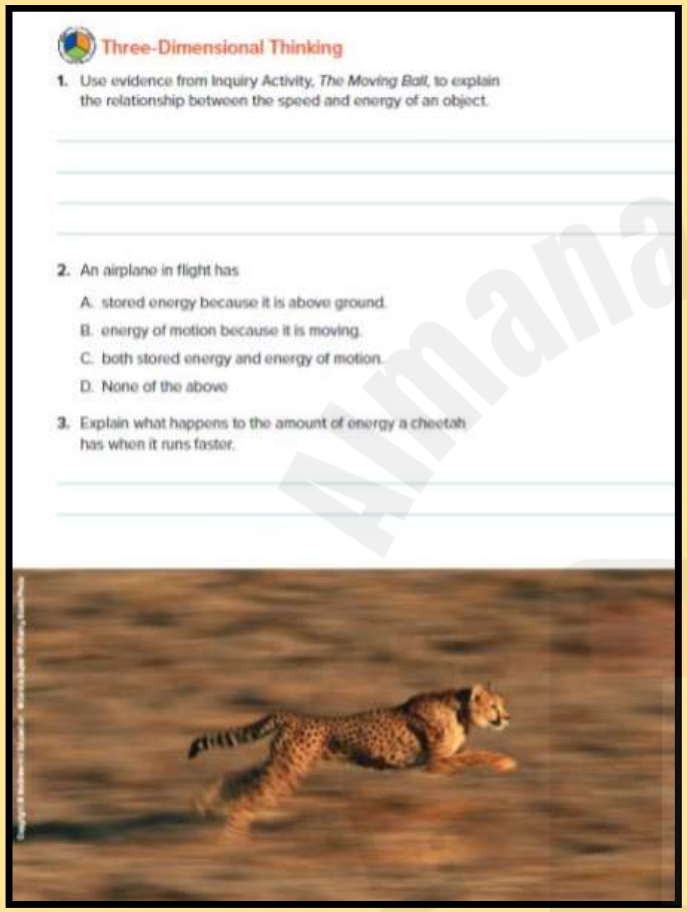
A. more slowly

B. faster

C. roughly at the same speed

D. rapidly and then slow down





Three-Dimensional Thinking

1. Use evidence from Inquiry Activity, *The Moving Ball*, to explain the relationship between the speed and energy of an object.

2. An airplane in flight has
   A. stored energy because it is above ground.
   B. energy of motion because it is moving.
   C. both stored energy and energy of motion.
   D. None of the above

3. Explain what happens to the amount of energy a cheetah has when it runs faster.

Q 14: Page 39 U1M1L2

- 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

Sample answer: The faster an object moves, the greater its energy. When the ramp was at its highest, the ball moved the fastest and had the most energy of motion.

2. An airplane in flight has

A. stored energy because it is above ground.

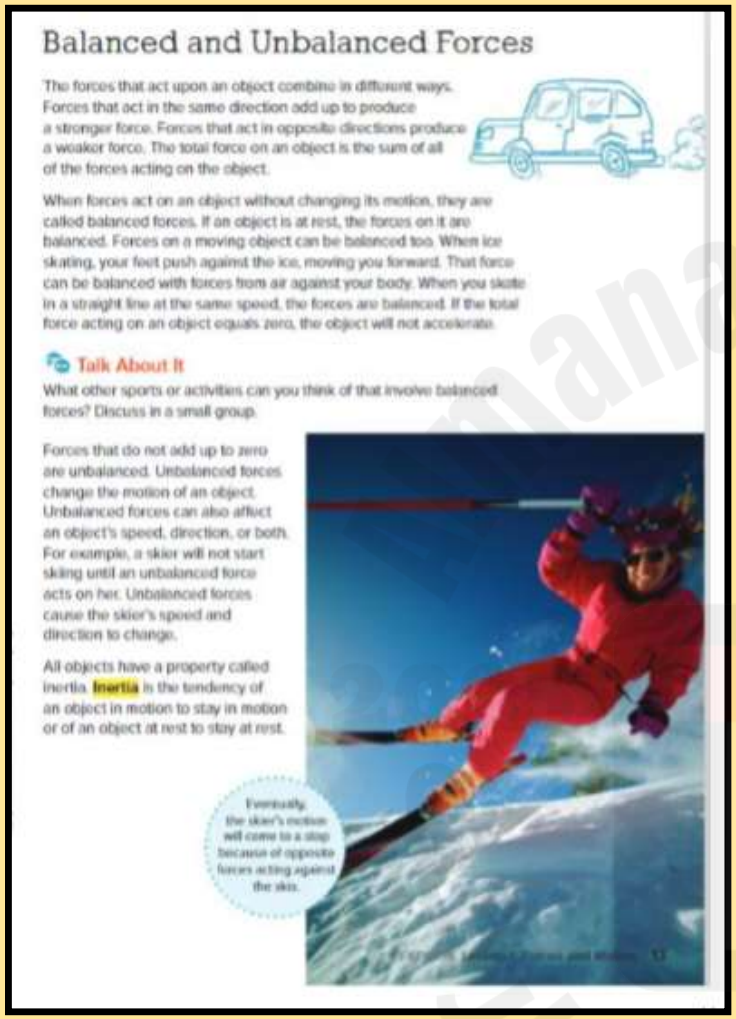
B. energy of motion because it is moving.

C. both stored energy and energy of motion.

D. None of the above

3. Explain what happens to the amount of energy a cheetah has when it runs faster.

Sample answer: The faster the cheetah runs, the greater its energy.



Balanced and Unbalanced Forces

The forces that act upon an object combine in different ways. Forces that act in the same direction add up to produce a stronger force. Forces that act in opposite directions produce a weaker force. The total force on an object is the sum of all of the forces acting on the object.

When forces act on an object without changing its motion, they are called balanced forces. If an object is at rest, the forces on it are balanced. Forces on a moving object can be balanced too. When ice skating, your feet push against the ice, moving you forward. That force can be balanced with forces from air against your body. When you skate in a straight line at the same speed, the forces are balanced. If the total force acting on an object equals zero, the object will not accelerate.

Talk About It

What other sports or activities can you think of that involve balanced forces? Discuss in a small group.

Forces that do not add up to zero are unbalanced. Unbalanced forces change the motion of an object. Unbalanced forces can also affect an object's speed, direction, or both. For example, a skier will not start skiing until an unbalanced force acts on her. Unbalanced forces cause the skier's speed and direction to change.

All objects have a property called inertia. **Inertia** is the tendency of an object in motion to stay in motion or of an object at rest to stay at rest.

Eventually, the skier's motion will come to a stop because of opposite forces acting against the skis.

Q 15: Page 13 U1M1L1

- 4-PS3-1: Use evidence to construct an explanation relating the speed of an object to the energy of that object.

Possible questions from U1 page 13

- What happens to forces acting in the same direction? We add (+) them to create a stronger force.

10 N + 20N =
30N right

- What happens to forces in opposite directions? We subtract (–) them to create a weaker force.

20 N - 10N =
30N left

- What is the net force? It is the total, or sum, of all the forces acting on the object

Possible questions from U1 page 13

- What are balanced forces?
- Forces that do not change an objects motion.
- Forces equal in size and opposite in direction, net force = 0N.
- Things not moving or not accelerating are balanced.
- What are unbalanced forces?
- Object speeds up, or down or changes direction
- Forces not equal or opposite.
- Unbalanced forces make the object accelerate in the direction of the net force.

Possible questions from U1 page 13

- What is inertia?
- A property of all objects:
- objects in motion stay in motion and,
- objects at rest stay at rest.

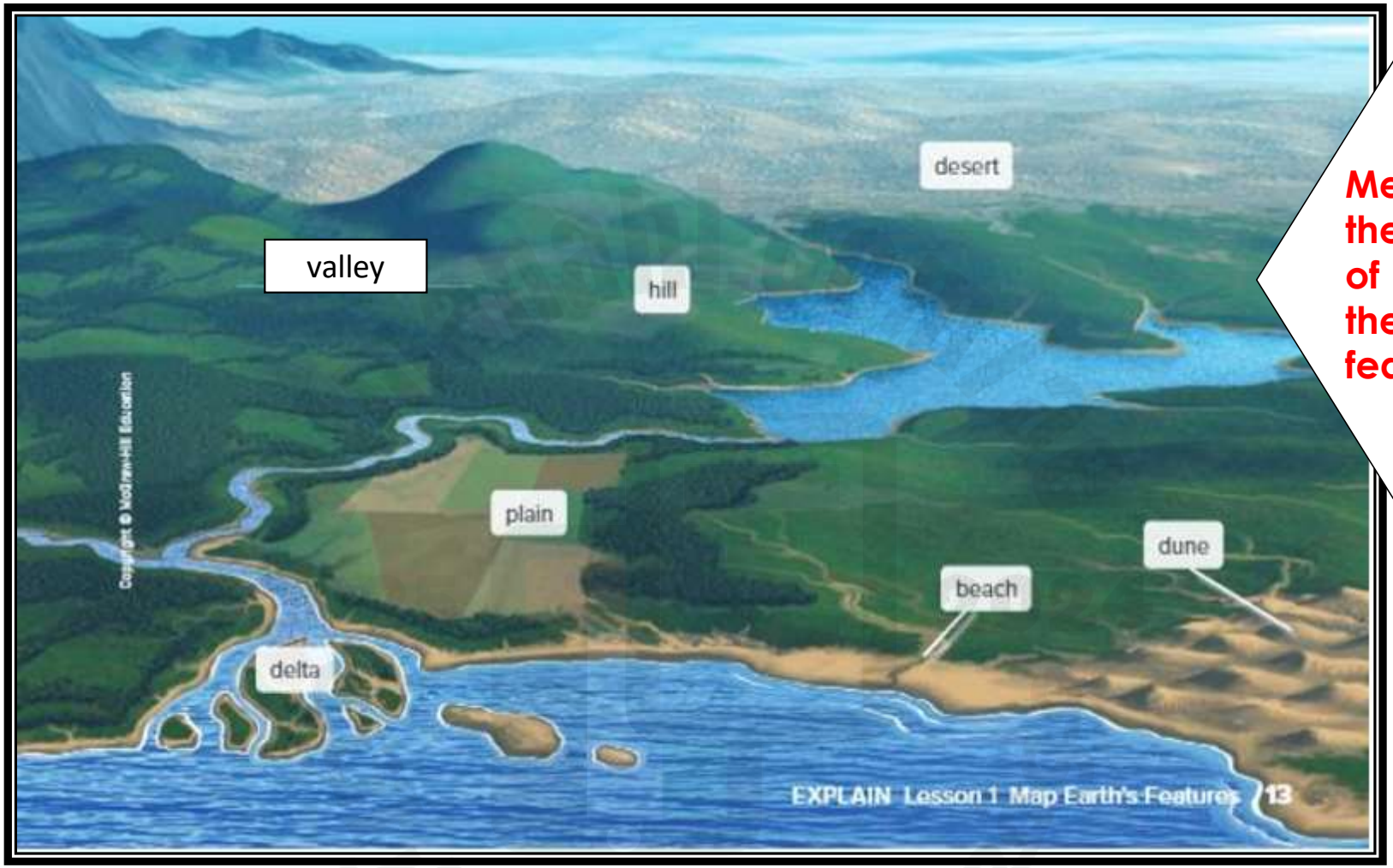
Q 16: Page 13
U3 M1L1 figure

- 4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features.

Possible questions from U3 page 13

Identify the landforms in the figure by:

- Naming the numbered part or
- Description of landform provided



Memorize the names of all these features!

Possible questions from U3 page 13

1. An area with very little precipitation. **desert**
2. A wide flat area. **plain**
3. Low land between hills and mountains. **valley**
4. Elevation of land smaller than a mountain. **hill**
5. Land at the mouth of a river. **delta**
6. Land / sand edge of water. **beach**
7. Mound of sand **dune**

All waves transfer energy without permanently moving the material through which they travel. This means that after a wave has passed, particles end up in about the same position they started in.

2. Draw waves with the characteristics indicated below.

Long wavelength, low frequency:

Drawing should show same height peaks and narrower waves.

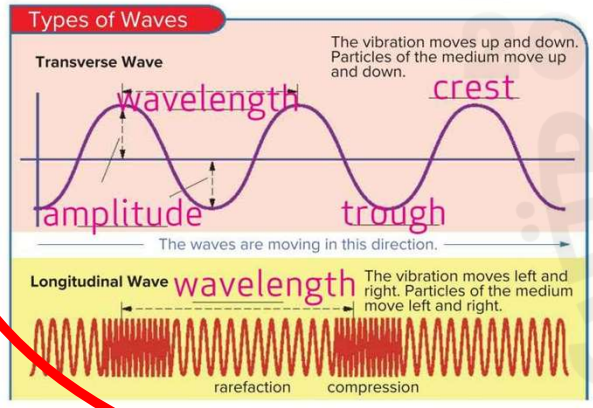
Short wavelength, high frequency:

Drawing should show same height peaks and wider waves.

Label a Diagram: Parts of Waves

Use what you learned to label the wavelength, amplitude, crest, and trough of each wave.

GO ONLINE Watch the video *Earthquake Movement* to see how earthquake waves move.



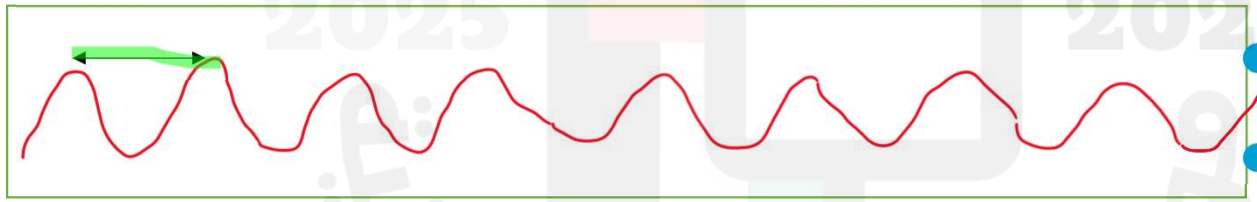
Q17: Figure Page 96 U3M2L2

- 4-PS4-1: Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

2. Draw waves with the characteristics indicated below.

Long wavelength, low frequency:

Short wavelength, high frequency:

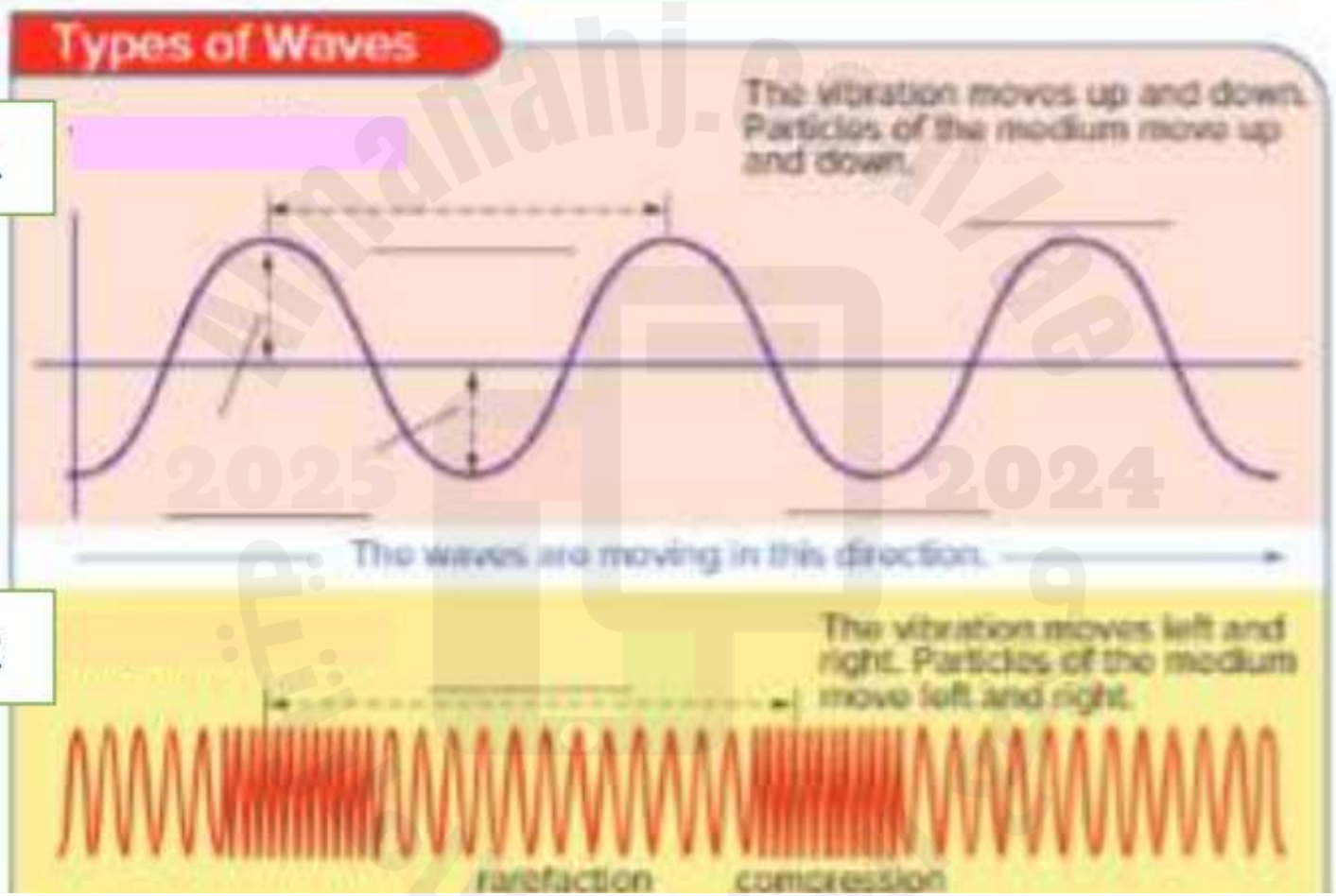


* Same height/ amplitude

Use what you learned to label the wavelength, amplitude, crest, and trough of each wave.

1

2

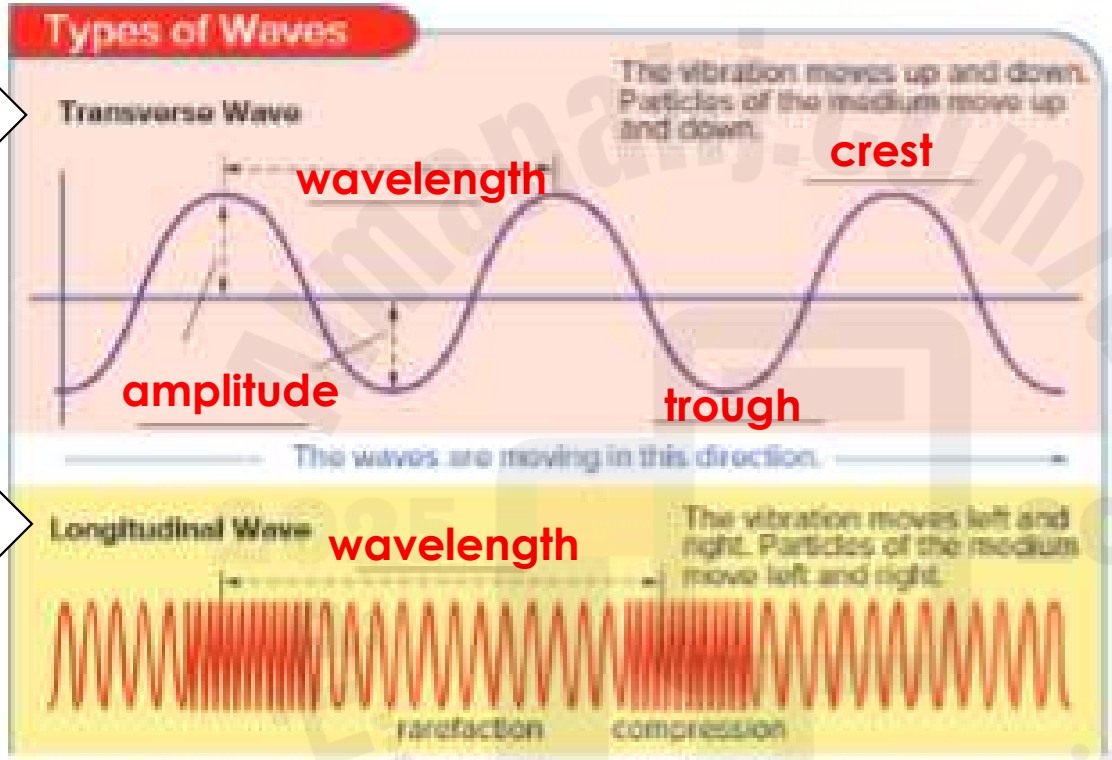


Label a Diagram: Parts of Waves

Use what you learned to label the wavelength, amplitude, crest, and trough of each wave.

GO ONLINE Watch the video *Earthquake Movement* to see how earthquake waves move.

Know they type of wave

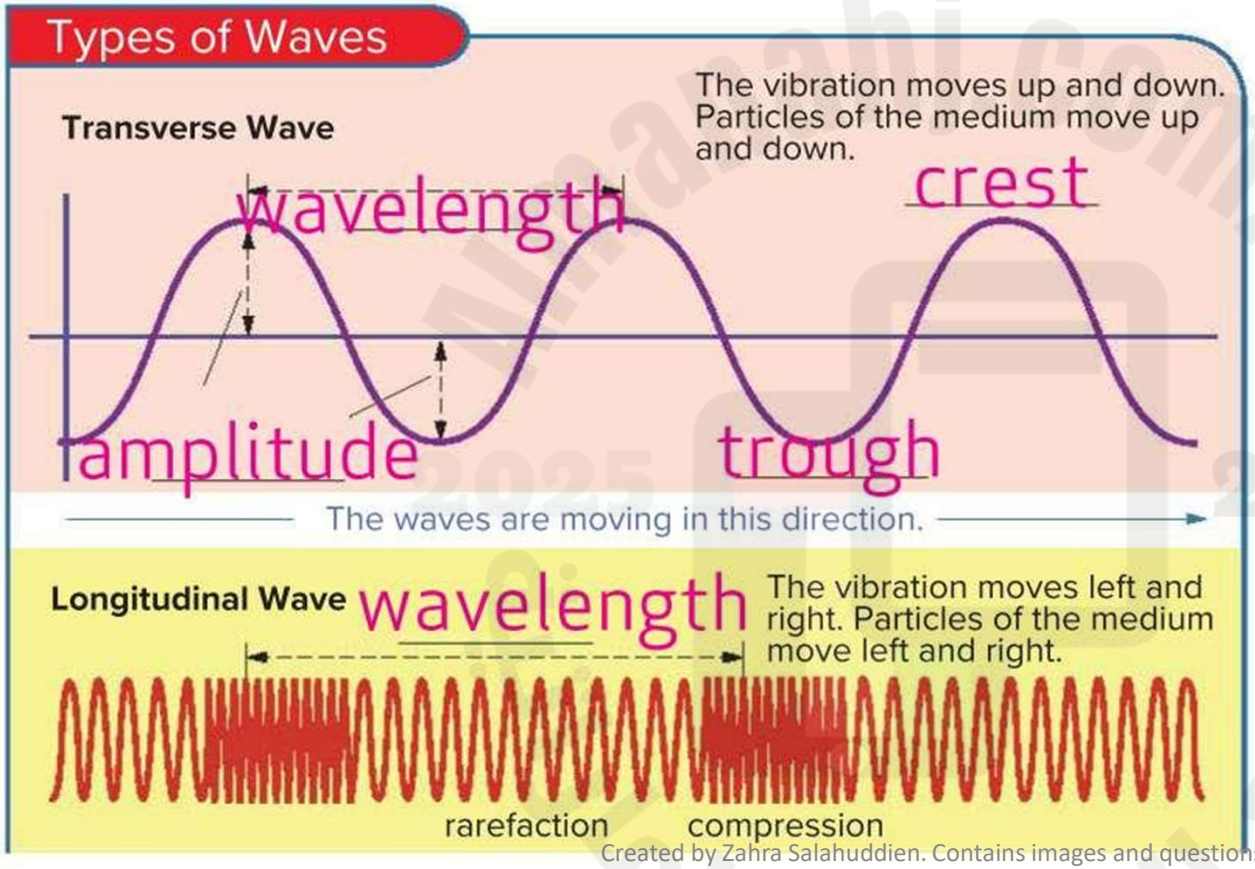


Know they type of wave

Label a Diagram: Parts of Waves

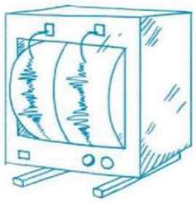
Use what you learned to label the wavelength, amplitude, crest, and trough of each wave.

GO ONLINE Watch the video *Earthquake Movement* to see how earthquake waves move.



* **Memorize the labels and name of waves**

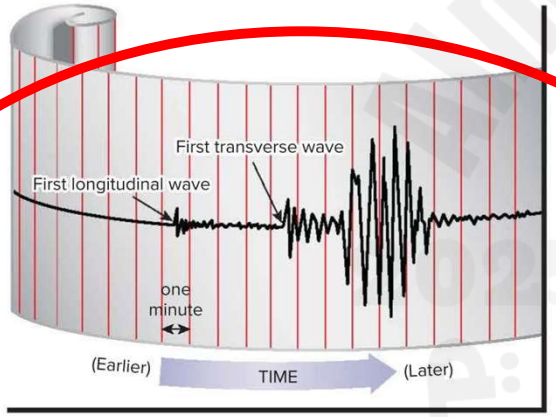
Record and Measure Earthquakes



Scientists measure seismic waves with a seismograph. A **seismograph** is an instrument used to detect and record earthquakes. The device shows the waves as curvy lines. The stronger the quake, the steeper the lines.

The amount of energy released by an earthquake is its **magnitude**. The Richter scale measures magnitude, the largest ground movement, when an earthquake occurs. It rates earthquakes from weakest to strongest starting at 1. Each larger whole number indicates that an earthquake has released 32 times more energy.

The Mercalli scale measures what people felt and what happened during an earthquake. It uses Roman numerals from I to XII.



3. What do you think happens to the amplitude of an earthquake wave when its magnitude increases?

Sample answer: The amplitude of an earthquake wave increases as the magnitude increases.

Q18: Figure Page 97 U3M2L2

- 4-PS4-1: Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

Possible questions about U3 page 97

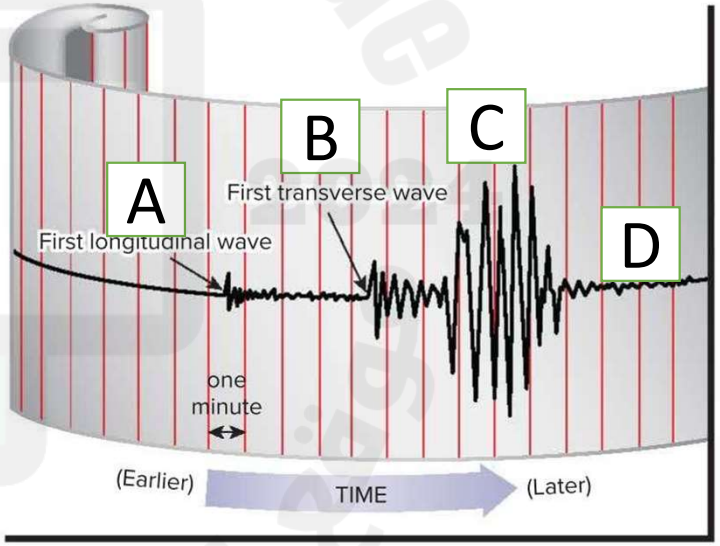
- The amount of energy release by an earthquake? **magnitude**
- What instrument is used to measure and detect earthquakes? **seismograph**
- Which scale uses numbers from 1 and measures magnitude/energy released in earthquakes? **Richter scale**
- Which scale uses roman numerals and measures what people felt in earthquakes? **Mercalli scale**
- How much more energy does an earthquake 7 have compared to 6 on the Richter scale? **32 times more energy**

3. What do you think happens to the amplitude of an earthquake wave when its magnitude increases?

amplitude increases

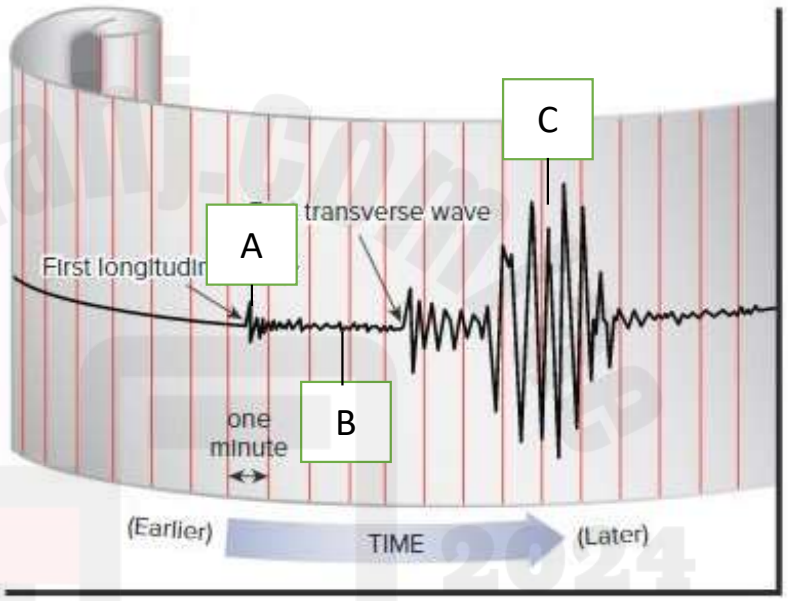
- How do we know where the earthquake was stronger? **Steeper lines / close together**
- Which wave was felt first? **Longitudinal / A**
- Where is amplitude greatest?

C



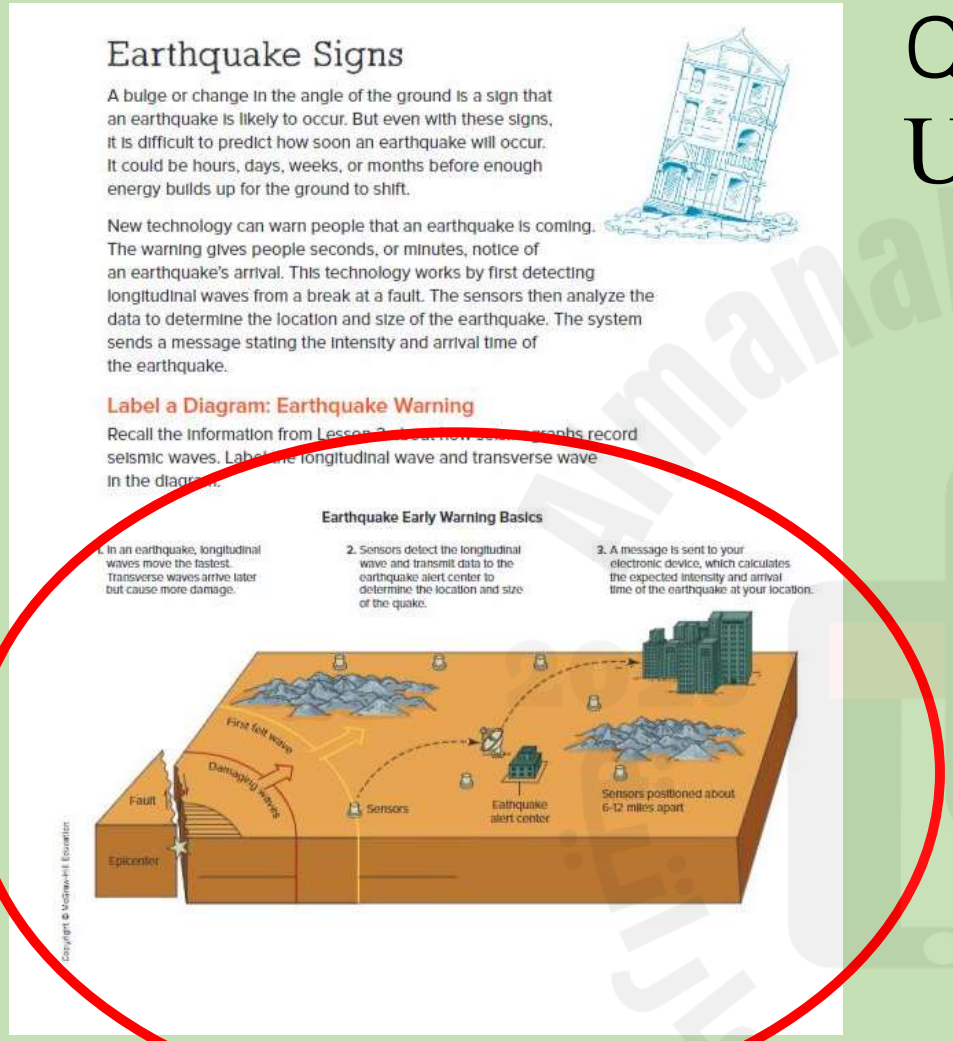
Where was the earthquake the strongest?

C



3. What do you think happens to the amplitude of an earthquake wave when its magnitude increases?

Amplitude increases



Earthquake Signs

A bulge or change in the angle of the ground is a sign that an earthquake is likely to occur. But even with these signs, it is difficult to predict how soon an earthquake will occur. It could be hours, days, weeks, or months before enough energy builds up for the ground to shift.

New technology can warn people that an earthquake is coming. The warning gives people seconds, or minutes, notice of an earthquake's arrival. This technology works by first detecting longitudinal waves from a break at a fault. The sensors then analyze the data to determine the location and size of the earthquake. The system sends a message stating the intensity and arrival time of the earthquake.

Label a Diagram: Earthquake Warning

Recall the information from Lesson 2 about how seismic graphs record seismic waves. Label the longitudinal wave and transverse wave in the diagram.

Earthquake Early Warning Basics

1. In an earthquake, longitudinal waves move the fastest. Transverse waves arrive later but cause more damage.
2. Sensors detect the longitudinal wave and transmit data to the earthquake alert center to determine the location and size of the quake.
3. A message is sent to your electronic device, which calculates the expected intensity and arrival time of the earthquake at your location.

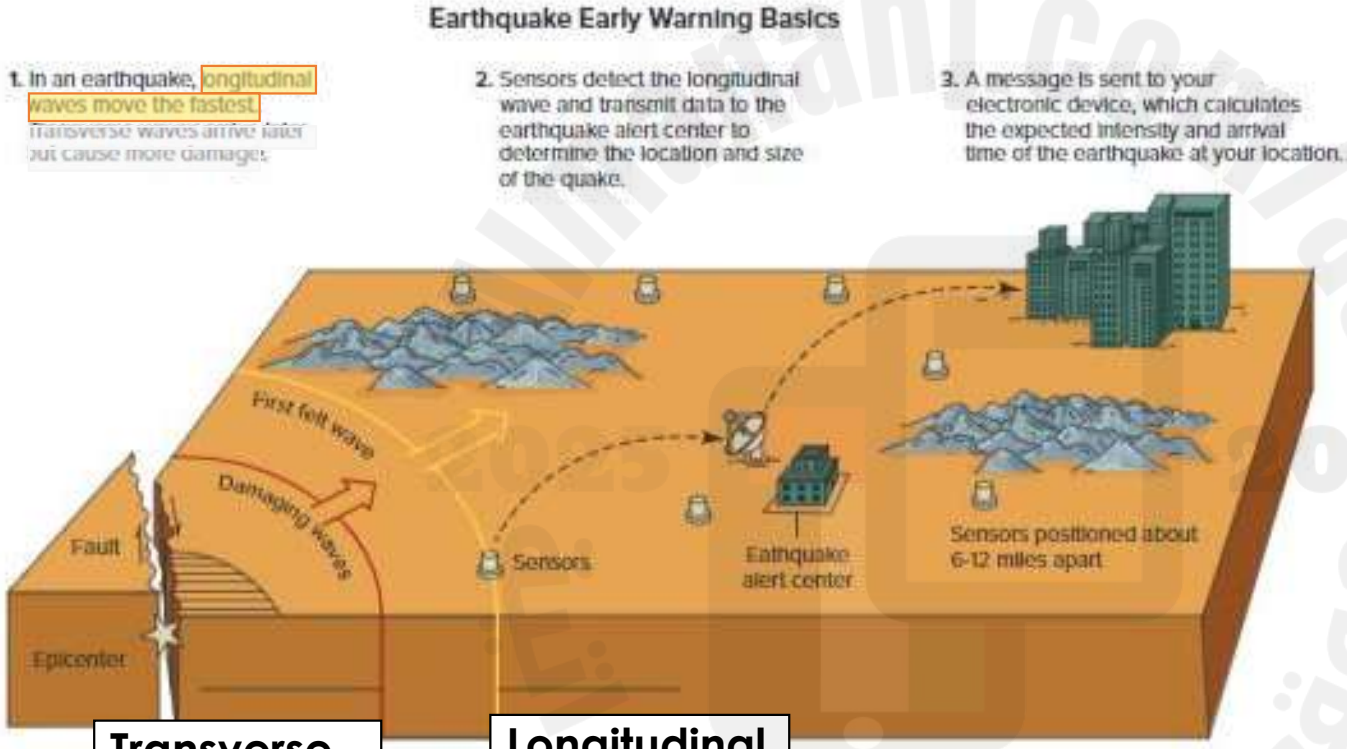
Q 19: Page 111
U3M2L2 Figure

- 4-PS4-1:: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Page 111

Label a Diagram: Earthquake Warning

Recall the information from Lesson 2 about how seismographs record seismic waves. Label the longitudinal wave and transverse wave in the diagram.



Transverse wave

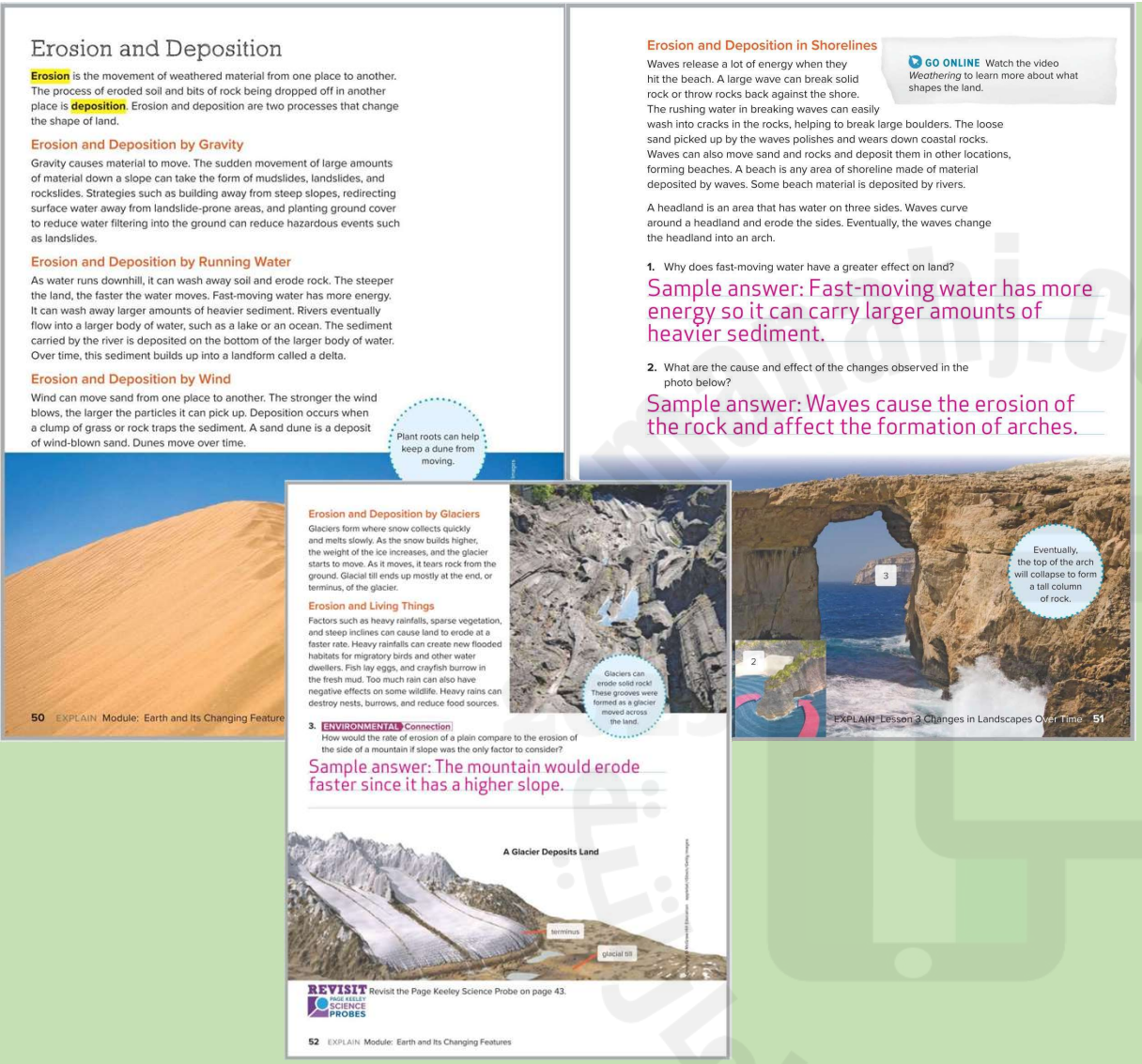
Longitudinal wave

* Memorize the labels and name of waves in the picture

Possible questions from U3 Page 111

- What is the first wave felt in an earthquake? longitudinal
- What wave causes more damage? transverse
- List the steps followed in a basic earthquake warning system:

1. Longitudinal waves felt first from epicenter at the fault.
2. Sensors detect longitudinal waves and alert sent out to earthquake center.
3. Message sent to your device that calculates size and time of earthquake coming before transverse waves come.



Erosion and Deposition

Erosion is the movement of weathered material from one place to another. The process of eroded soil and bits of rock being dropped off in another place is **deposition**. Erosion and deposition are two processes that change the shape of land.

Erosion and Deposition by Gravity

Gravity causes material to move. The sudden movement of large amounts of material down a slope can take the form of mudslides, landslides, and rockslides. Strategies such as building away from steep slopes, redirecting surface water away from landslide-prone areas, and planting ground cover to reduce water filtering into the ground can reduce hazardous events such as landslides.

Erosion and Deposition by Running Water

As water runs downhill, it can wash away soil and erode rock. The steeper the land, the faster the water moves. Fast-moving water has more energy. It can wash away larger amounts of heavier sediment. Rivers eventually flow into a larger body of water, such as a lake or an ocean. The sediment carried by the river is deposited on the bottom of the larger body of water. Over time, this sediment builds up into a landform called a delta.

Erosion and Deposition by Wind

Wind can move sand from one place to another. The stronger the wind blows, the larger the particles it can pick up. Deposition occurs when a clump of grass or rock traps the sediment. A sand dune is a deposit of wind-blown sand. Dunes move over time.

Plant roots can help keep a dune from moving.

50 EXPLAIN Module: Earth and Its Changing Feature

Erosion and Deposition by Glaciers

Glaciers form where snow collects quickly and melts slowly. As the snow builds higher, the weight of the ice increases, and the glacier starts to move. As it moves, it tears rock from the ground. Glacial till ends up mostly at the end, or terminus, of the glacier.

Erosion and Living Things

Factors such as heavy rainfalls, sparse vegetation, and steep inclines can cause land to erode at a faster rate. Heavy rainfalls can create new flooded habitats for migratory birds and other water dwellers. Fish lay eggs, and crayfish burrow in the fresh mud. Too much rain can also have negative effects on some wildlife. Heavy rains can destroy nests, burrows, and reduce food sources.

Glaciers can erode solid rock! These grooves were formed as a glacier moved across the land.

3. ENVIRONMENTAL Connection
How would the rate of erosion of a plain compare to the erosion of the side of a mountain if slope was the only factor to consider?

Sample answer: The mountain would erode faster since it has a higher slope.

A Glacier Deposits Land

terminus

glacial till

REVISIT PAGE KEELEY SCIENCE PROBES Revisit the Page Keeley Science Probe on page 43.

52 EXPLAIN Module: Earth and Its Changing Features

Erosion and Deposition in Shorelines

GO ONLINE Watch the video *Weathering* to learn more about what shapes the land.

Waves release a lot of energy when they hit the beach. A large wave can break solid rock or throw rocks back against the shore. The rushing water in breaking waves can easily wash into cracks in the rocks, helping to break large boulders. The loose sand picked up by the waves polishes and wears down coastal rocks. Waves can also move sand and rocks and deposit them in other locations, forming beaches. A beach is any area of shoreline made of material deposited by waves. Some beach material is deposited by rivers.

A headland is an area that has water on three sides. Waves curve around a headland and erode the sides. Eventually, the waves change the headland into an arch.

1. Why does fast-moving water have a greater effect on land?

Sample answer: Fast-moving water has more energy so it can carry larger amounts of heavier sediment.

2. What are the cause and effect of the changes observed in the photo below?

Sample answer: Waves cause the erosion of the rock and affect the formation of arches.

3

2

Eventually, the top of the arch will collapse to form a tall column of rock.

EXPLAIN Lesson 3 Changes in Landscapes Over Time 51

Q 20: Page 50,51,52 U3M1L3

- 4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Created by Zahra Salahuddien. Contains images and questions from Inspire Platform

Possible questions from U3 page 50–52

- What is the movement of weathered material from one place to another called? erosion
- What is the process of eroded soil and bits of rock being dropped off in another place called? deposition
- What process causes sand dunes to form? deposition
- What process can cause landslides? erosion
- How can erosion be prevented? Plant roots can keep the sand from moving, plant trees.

Possible questions from page 50–52

- What can cause erosion and deposition?
- Gravity
- Running water
- Wind
- Living things
- Glaciers
- Shorelines

*** This question has too many options to list, so make sure to understand the basics.**

What caused this dune to form?

1) Fill in the blanks using the available answer choices.

An example of _____ is wind blowing sand from one place to another.

(Blank 1)

Blank 1 options

- Erosion
- Deposition

3) Which evidence could indicate that a flood has happened in an area?

- ○ A new mountain has formed.
- ○ The sky is cloudy.
- ○ A palm tree is charred black.
- ○ Soil and rocks are on the road and sidewalks.

2) In the Mississippi River, sediment such as soil and rocks are swept downstream by the force of the river. When the river flows into the Gulf of Mexico, most of the sediment is deposited.
Which activity could change the amount of sediment that is deposited from the river?

- An increase in rain will cause more erosion, which will cause more sediment to be deposited.
- A decrease in rain will cause less erosion, which will cause more sediment to be deposited.
- An increase in rain will cause less erosion, which will cause more sediment to be deposited.
- An increase in rain will cause more erosion, but will not cause a change in sediment deposited.

5) Gravity pulls rainwater downhill and the flowing water erodes the landscape by _____.

- ○ forming sand dunes
- ○ washing away soil
- ○ forming a desert
- ○ forming moraines

*These are only suggested guides for possible questions. Please study all pages mentioned carefully.
*Questions might appear in a different order in the actual exam, or on the exam paper in the case of G3 and G4