

Student name: _____

Which of the following was mentioned in the opening two-page spread of Chapter 1?

oil beneath the Arctic National Wildlife Reserve

sandstone arches in Utah

earthquakes along the San Andres fault

the scenery of Banff National Park

On maps showing the ocean floor, what do the varying shades of blue represent?

sediment types

bedrock types

depth to the ocean floor

age of the ocean floor

What is geology?

the study of landscapes

the science of Earth

the practice of mapmaking

the study of atmospheric processes

Which of these descriptions of North America is incorrect?

The western part has mountains and valleys.

The mountains in the eastern part are taller than those in the west.

The central portion has broad plains.

The East Coast is lined with a broad shelf.

On a map that shows the nature of the land surface, what does the color brown represent?

vegetation

water

rock, sediment, or soil

continental shelves

Which of the following areas is probably least at risk for geologic hazards?

next to a river in low areas

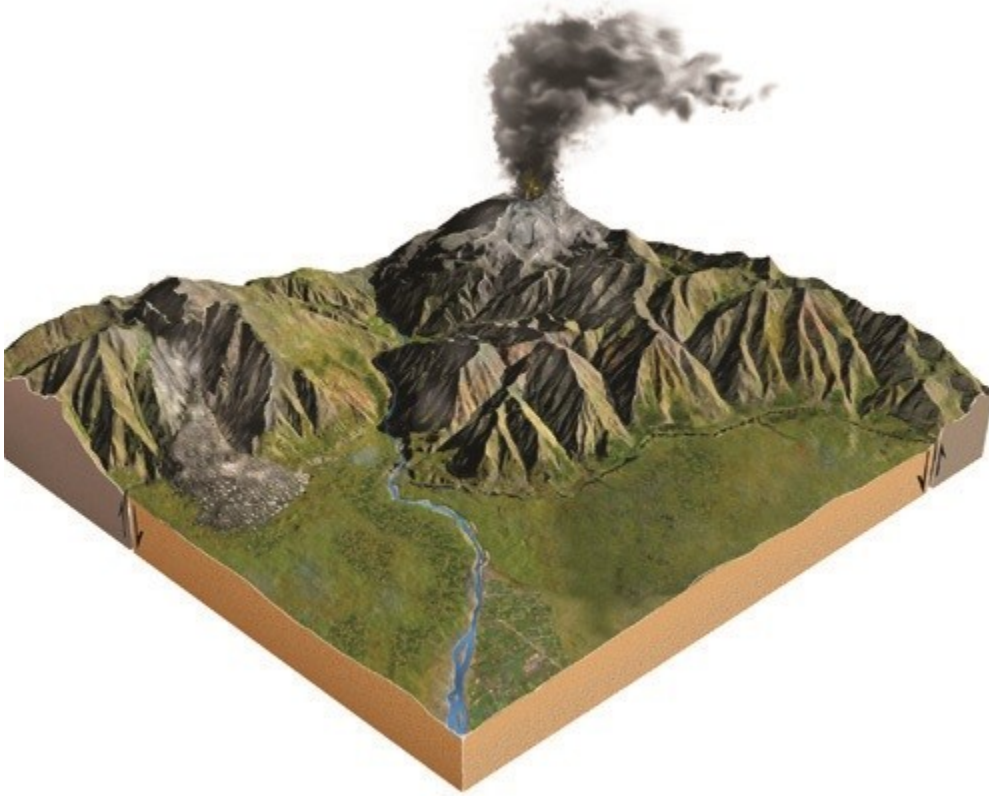
near an active fault

on soils that gently expand when wet

on gentle slopes away from mountains

close to, but upwind of, an active volcano

Which potential geologic hazard is NOT represented by a feature on this figure?



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An earthquake

A volcano

Contaminated groundwater

A landslide

Flood-prone areas

Which of the following geologic aspects influences our lives based on the photograph in the textbook showing horses and cows on a grassy field?

the presence of mountains, which influences the formation of clouds and precipitation

the steepness of slopes

the availability of water

All of these choices are correct.

In a landscape that contains all of the following features, which area is the most likely for viable human settlement?

snow-covered mountains

steep slopes of bare rock

elevated platforms of bare rock

flat, low valleys with a water source

The distribution of natural resources is influenced by the
type of rocks.

age of the rocks.

way in which the rocks formed.

All of these choices are correct.

Which of the following factors was most important in controlling the distribution of copper mines in the western U.S. versus iron mines in the Great Lakes region?

the amount of precipitation (rain and snow)

the time of year when precipitation occurs

different ages and geologic histories of the rocks

the latitude (distance south or north from the equator)

The large copper deposits in the mountainous regions of western North America are associated with

an ancient ocean.

magma intrusions.

recent river deposits.

alpine glacier activity.

Geology can help us learn about Earth's past by studying

why continents and oceans are different.

why a landscape looks the way it does.

how life in the past was different than today.

how global climate has changed since the ice ages.

All of these choices are correct.

Which of the following is NOT a way geology informs us about Earth's past?

how the first second of the universe differed from a second today

why continents and oceans are different

why a landscape looks the way it does today

how life in the past was different than today

how past global climate was different than today

The continental shelf is

part of the ocean floor.

part of a continent.

a unique area that is neither ocean floor nor continent.

Which one of the following descriptions of the seafloor is most accurate?

It is all quite flat.

It doesn't vary in elevation very much.

It is complex, with various features and depths.

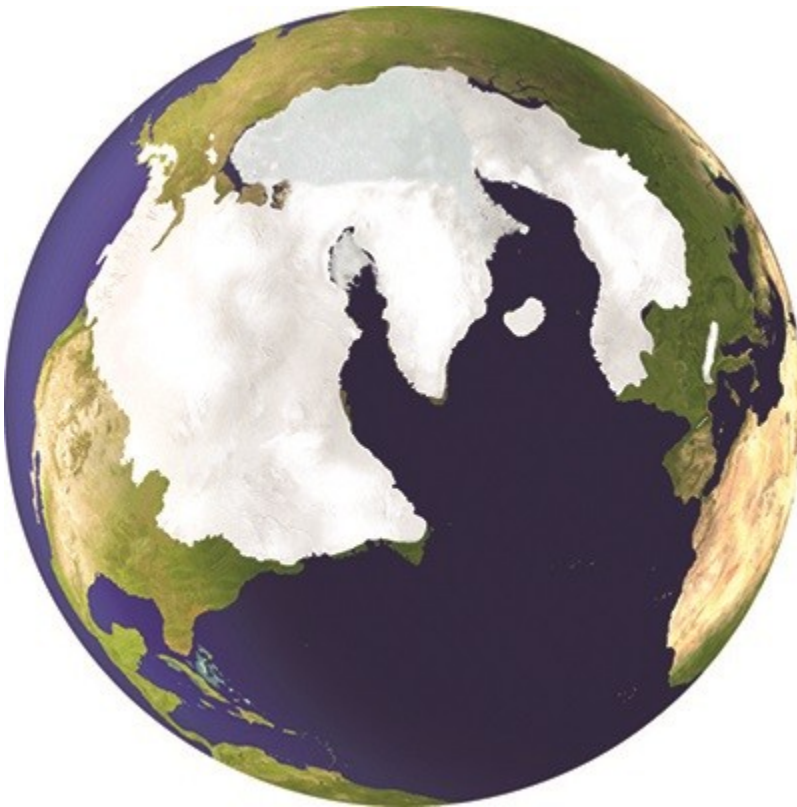
Continents differ in appearance from ocean basins because

each has its own geologic history.

each contains different fossils.

each has its own climate.

Continental ice sheets were more common 28,000 years ago than they are today because



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the Earth had more water then than now.

the Earth was cooler then than now.

the Earth was farther away from the Sun then than now.

How's has Earth's climate changed in the past 20,000 years?

Climate has warmed.

Climate has cooled.

Climate has not changed.

What evidence do we have that shows life was quite different than it is now in the geologic past?

fossils of animals and plants

written records

photographs

drawings

The main layers of Earth in correct order, from the surface moving down, are

upper crust, outer core, inner core, mantle.

outer core, inner core, upper mantle, lower crust.

crust, mantle, outer core, inner core.

upper mantle, lower mantle, inner core, crust.

Which of the following Earth layers is the thinnest?

oceanic crust

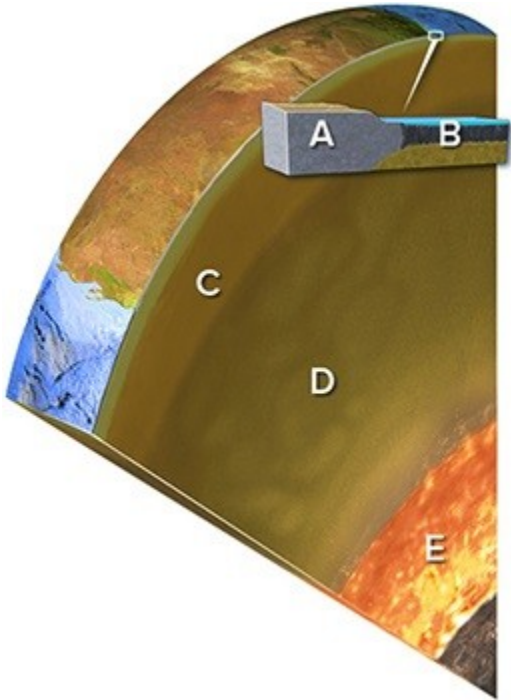
upper mantle

lower mantle

outer core

inner core

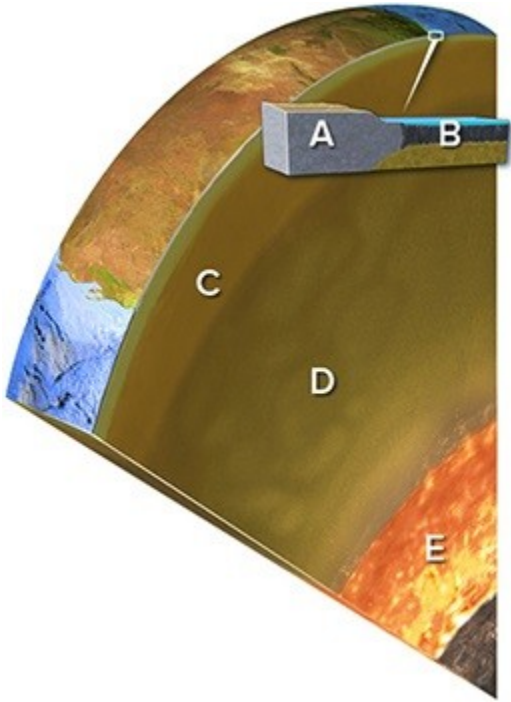
Which layer on this figure is the upper mantle?



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- A
- B
- C
- D
- E

Which layer on this figure is the continental crust?



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A

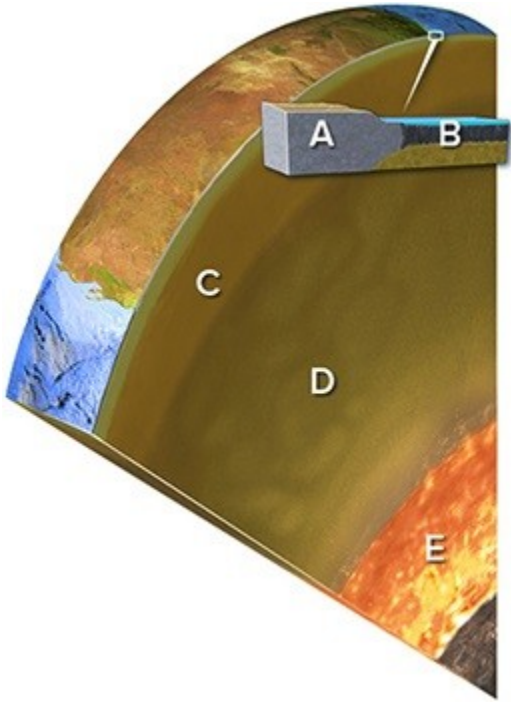
B

C

D

E

Which layer on this figure is the oceanic crust?



McGraw Hill Education

A

B

C

D

E

Which layer in the earth is similar to the composition of granite?

continental crust

oceanic crust

upper mantle

lower mantle

core

Which layer on Earth is similar in composition to basalt, a dark lava rock?

continental crust

oceanic crust

upper mantle

lower mantle

core

Which layer on Earth is similar to the green mineral olivine?

continental crust

oceanic crust

mantle

core

Which layer on Earth is similar in composition to an iron-nickel meteorite?

continental crust

oceanic crust

upper mantle

lower mantle

core

Which of the following is NOT a possible reason for why a region is higher in elevation than adjacent regions?

The lithosphere is hotter.

It has continental crust, but adjacent regions have oceanic crust.

The crust is thicker.

The crust is denser.

What is the most likely reason why a region is higher than adjacent regions?

There is a hot spot beneath it.

The crust is thicker.

It is underlain by oceanic crust.

The asthenosphere is hotter.

The crust is hotter.

Which of the following is the best description of what the lithosphere contains?

continental and oceanic crust

both types of crust and the uppermost mantle

weak part of the upper mantle

upper and lower mantle

lower mantle and outer core

Which of the following Earth layers is the thickest?

continental crust

oceanic crust

mantle

outer core

The principle of isostasy refers to

the difference in the strength of the mantle versus the crust.

the relationship between regional elevations and thickness of crust.

how the outer core differs from the inner core.

how the upper mantle differs from the lower mantle.

Which of the following is NOT an important difference between continental crust and ocean crust?

thickness

composition

density

whether it is part of the lithosphere

elevation

Which of the following combinations would result in the highest regional elevations?

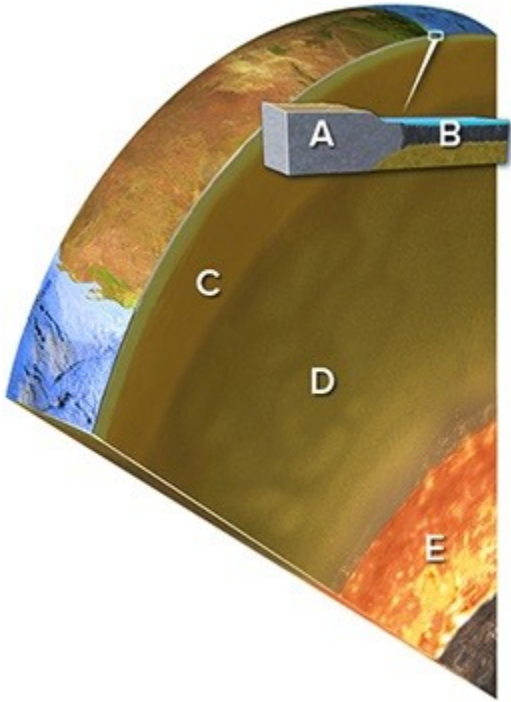
thin, dense crust

thick, dense crust

thin, less dense crust

thick, less dense crust

Which layer on this figure is the outer core?



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A

B

C

D

E

Compared to oceanic crust, continental crust is thinner.

more dense.

lighter in color.

All of these choices are correct.

The main difference between the lithosphere and the asthenosphere is the asthenosphere is less rigid.

asthenosphere flows less easily.

asthenosphere is cooler.

asthenosphere has more oceanic crust.

asthenosphere has more continental crust.

Based on this topographic profile across the central United States, which region probably has the thickest crust?



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Colorado Rockies

Great Plains

Mississippi River

Appalachian Mountains

East Coast

Based on this topographic profile across the central United States, which region probably has neither the thinnest nor thickest crust?



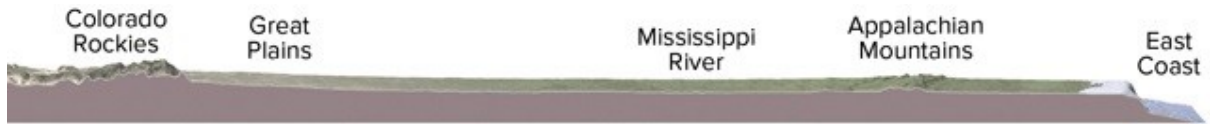
McGraw Hill Education

Colorado Rockies

Mississippi River

East Coast

Based on this topographic profile across the central United States, which region probably has the thinnest crust?



McGraw Hill Education
Colorado Rockies

Great Plains

Mississippi River

Appalachian Mountains

East Coast

Which of these best describes the location of the core within Earth?

The core is located in the central zone of Earth, beneath the mantle.

The core is located between the thin surface crust and the thick mantle.

The core is located at the surface of Earth, forming a thin skin.

What is the largest of Earth's concentric zones by volume?

the crust

the mantle

the core

The asthenosphere is part of the

mantle.

lithosphere.

The asthenosphere is beneath the
lithosphere.
mantle.
outer core.

What happens to a mountain in terms of isostatic adjustment following a period of significant erosion?

The continent underneath will be uplifted.
The continent underneath will subside.
Erosion does not affect isostasy.

What is the condition of equilibrium or balance in a system called? Geologists often use this term to describe crustal blocks floating on the asthenosphere.

isostasy
convection
Curie point
geothermal gradient

The lithosphere is
also called the crust.
also called the mantle.
the rigid portion of Earth (crust and upper mantle).
where convection occurs in the mantle.

Which type of crust has the greater thickness?

continental

oceanic

Oceanic crust is

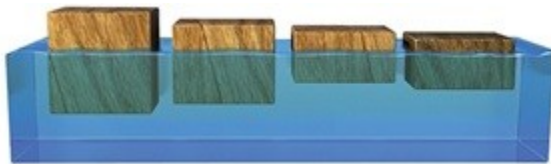
thinner and less dense than continental crust.

thinner and denser than continental crust.

thicker and less dense than continental crust.

thicker and denser than continental crust.

The leftmost block of wood is like a mountain range on Earth in that it



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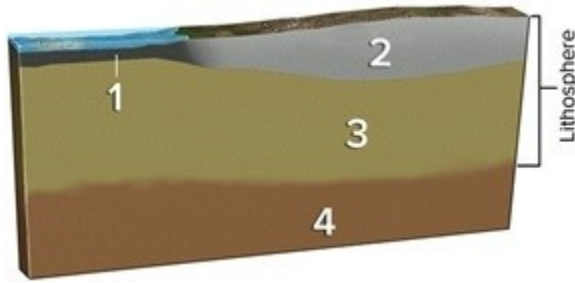
is composed of less dense materials and is a thick block (crust) compared to other blocks (land areas on Earth).

is composed of more dense materials and is a thick block (crust) compared to other blocks (land areas on Earth).

is over a part of the Earth where the mantle is unusually thin.

is underlain by ocean.

In this diagram, which layer(s) correspond to the mantle?



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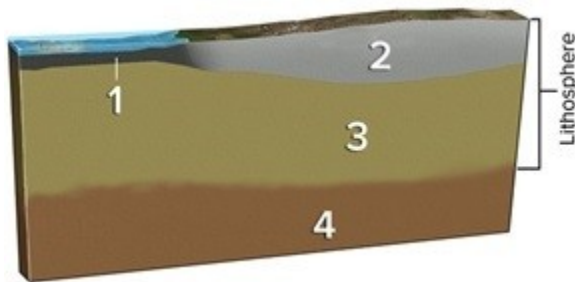
1 and 2

3

3 and 4

4

In this diagram, which layer(s) is(are) able to flow rather than being brittle?



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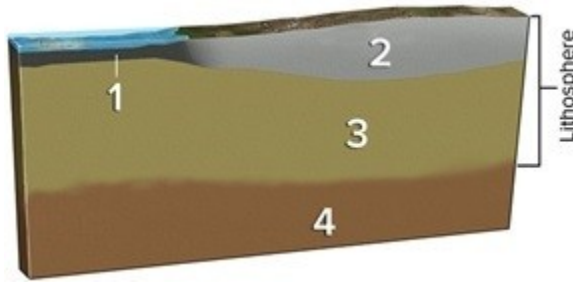
1 because water helps lubricate it

2 because the rocks are of a different composition than in the other layers

1, 2, and 3 because they are not under as much pressure as 4

4 because it is under so much more pressure than 1, 2, and 3

Which of the layers in the diagram below are solid or mostly solid?



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1 and 2

2 and 3

1, 2, and 3

All four layers are solid or mostly solid.

Which of the following is true about processes that affect Earth?

Atmospheric pressure is less at sea level than in high mountains.

Forces decrease downward within Earth.

Forces are imposed on deep rocks from all directions.

All heat inside Earth comes from magma.

None of these is true about Earth processes.

Which of the following is true about gravity?

Gravity of the Sun and Moon exert a pull on Earth.

The mass of Earth causes a downward pull on objects on Earth.

Gravity causes ice, water, and rocks to move downhill.

All these are true about gravity.

Which of these descriptions is not true about air pressure?

Air pressure is relatively low on top of high mountains.

Air pressure is relatively high at sea level.

Differences in air pressure are related to gravity.

Elevation does not affect air pressure.

Which of the following is true about forces and energy imposed on Earth from space?

Internal processes within the Moon produce light during the night.

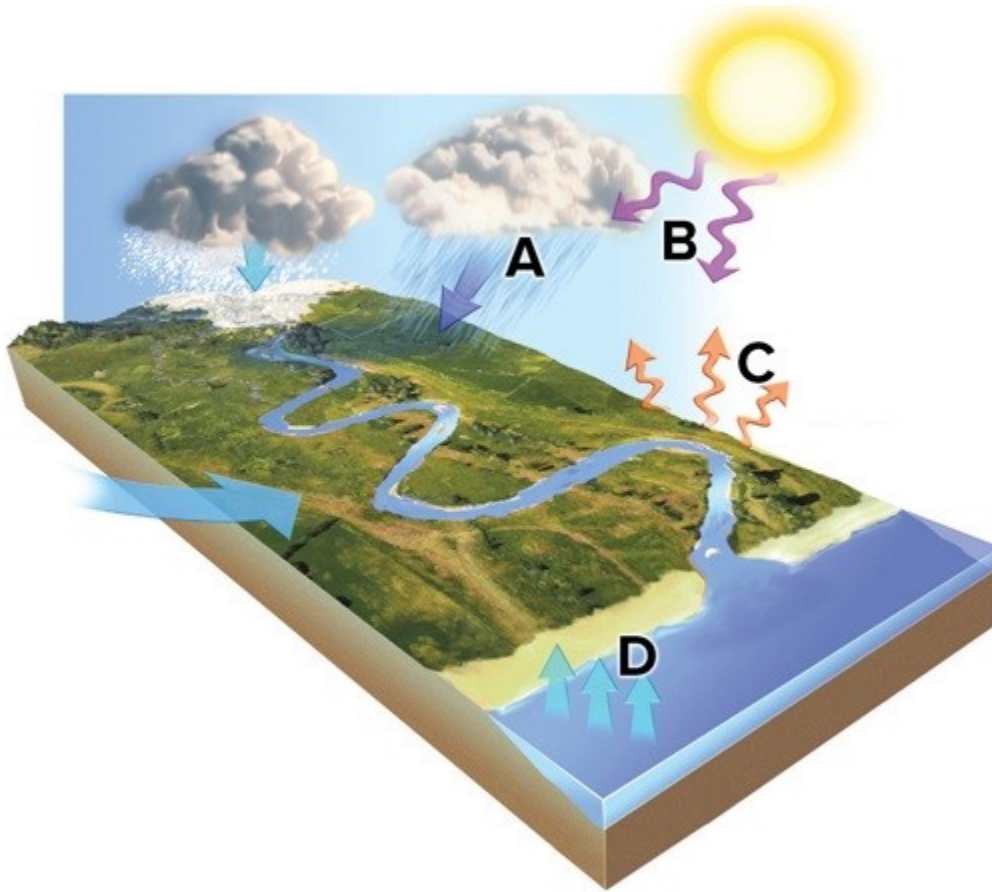
All the Sun's electromagnetic energy is blocked by Earth's protective atmosphere.

Our massive Sun is the only object that exerts a gravitational pull on Earth.

All of these choices are correct.

None of these choices are correct.

Which arrows in this figure indicate infrared energy, which has been converted from ultraviolet energy?



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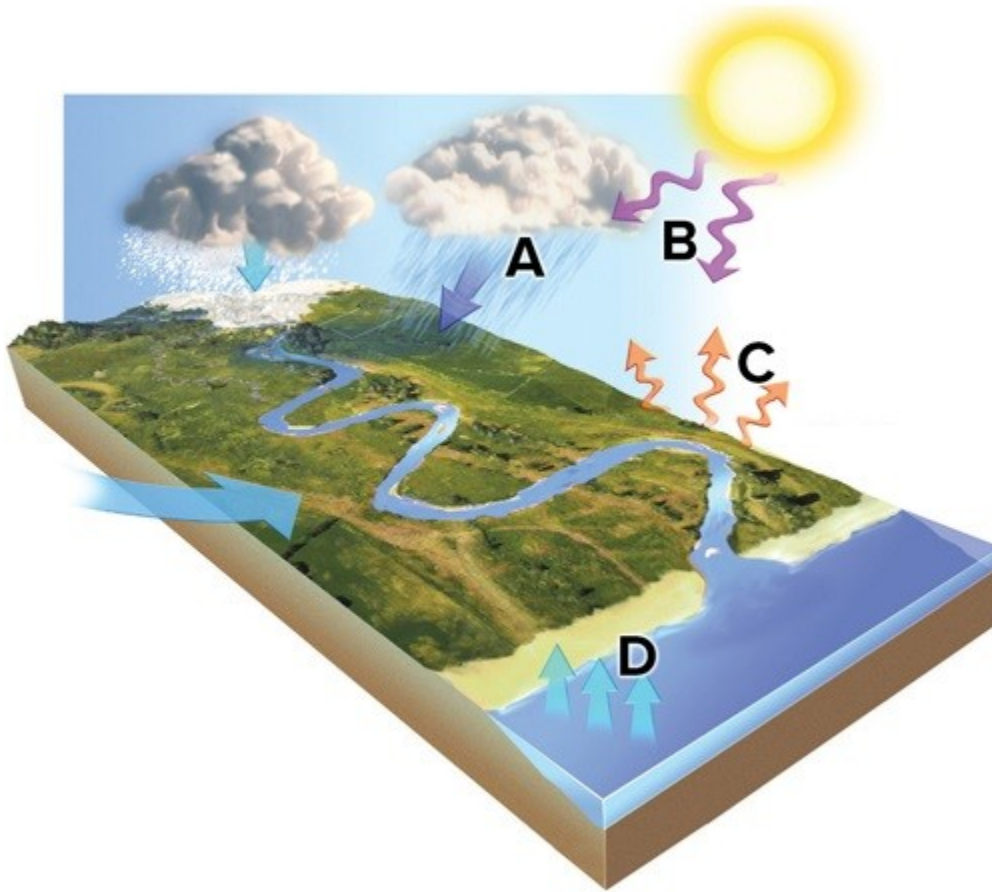
A

B

C

D

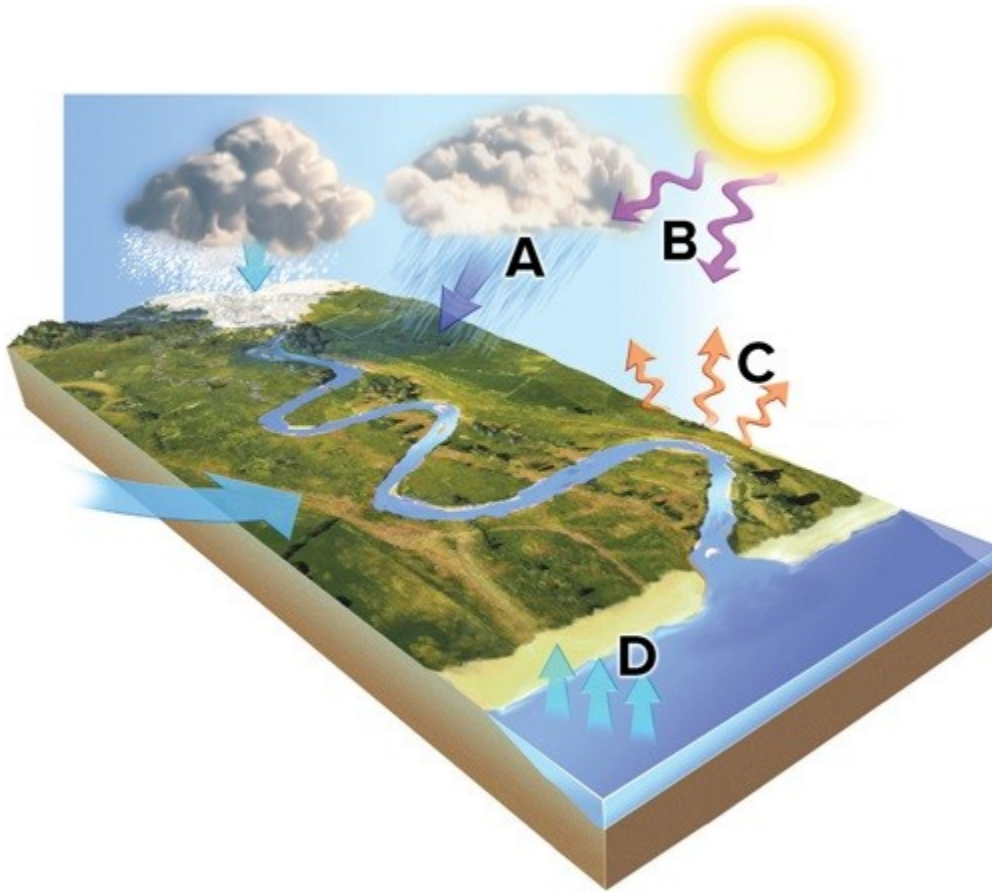
Which arrows in this figure indicate evaporation?



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- A
- B
- C
- D

Which arrows in this figure indicate ultraviolet energy, an external energy source?



McGraw Hill Education

- A
- B
- C
- D

Which of the following are ways that the atmosphere interacts with Earth's surface?

Liquid water on the surface can evaporate, becoming water vapor in the atmosphere.

The atmosphere includes a low percentage of water vapor, most of which comes from the oceans.

Earth's atmosphere blocks most of the Sun's harmful ultraviolet radiation.

Some energy that strikes the earth is converted into infrared energy.

All these are ways that the atmosphere interacts with Earth's surface.

What is the relationship between the Sun and wind on Earth's surface?

The solar wind creates Earth's surface winds.

Uneven heating of Earth by the Sun results in wind.

They are unrelated.

What happens to material that is hotter than its surrounding material deep within the Earth?

The hot material slowly moves up toward the surface.

The hot material moves slowly down toward the core.

Nothing; the hot material doesn't move at all.

Radioactive decay in Earth, especially in Earth's crust, creates a tremendous amount of pressure.

heat.

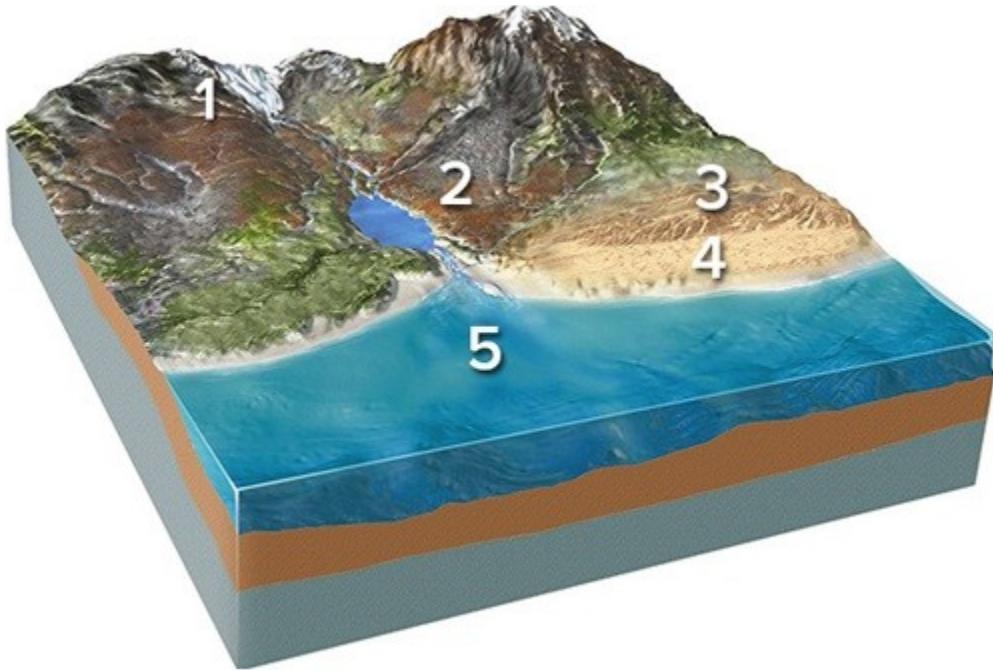
Radioactive decay within Earth produces heat; the other form of heat produced by Earth comes from

heat trapped when Earth was formed.

solar radiation trapped in the rock on Earth's surface.

heat produced by air as it moves across the oceans.

Which of the following locations would contain a wide variety of sediment, from large angular blocks to fine rock powder, produced from grinding of the rocks?



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location 1, along the margins of a glacier

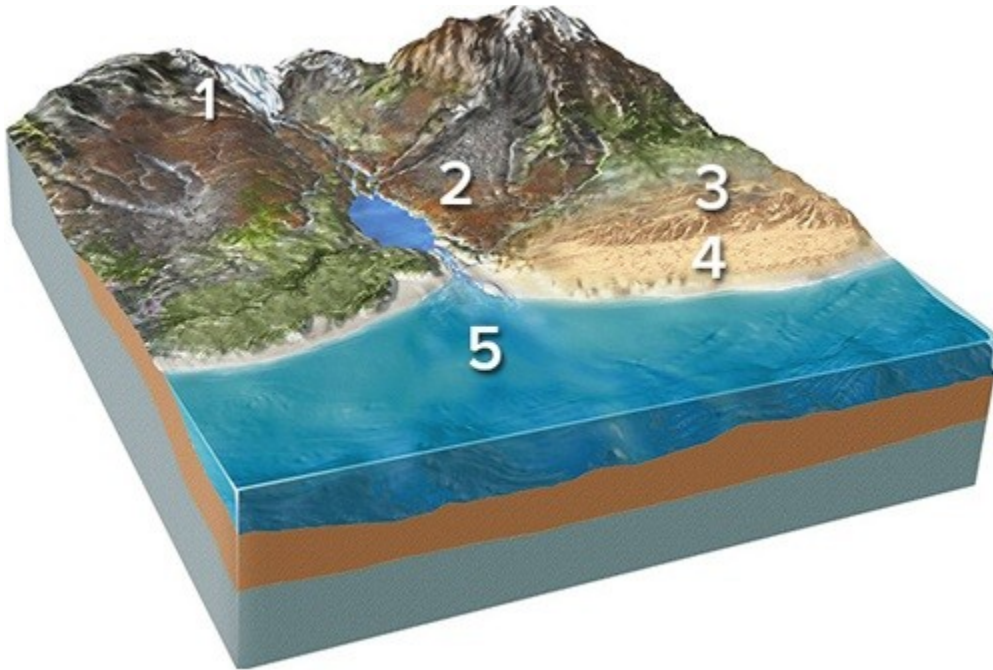
location 2, along a steep mountain front

location 3, in sand dunes

location 4, along a beach

location 5, on relatively deep seafloor

Which of the following locations would contain large, angular rocks that broke away from bedrock and moved downhill?



McGraw Hill Education

location 1, along the margins of a glacier

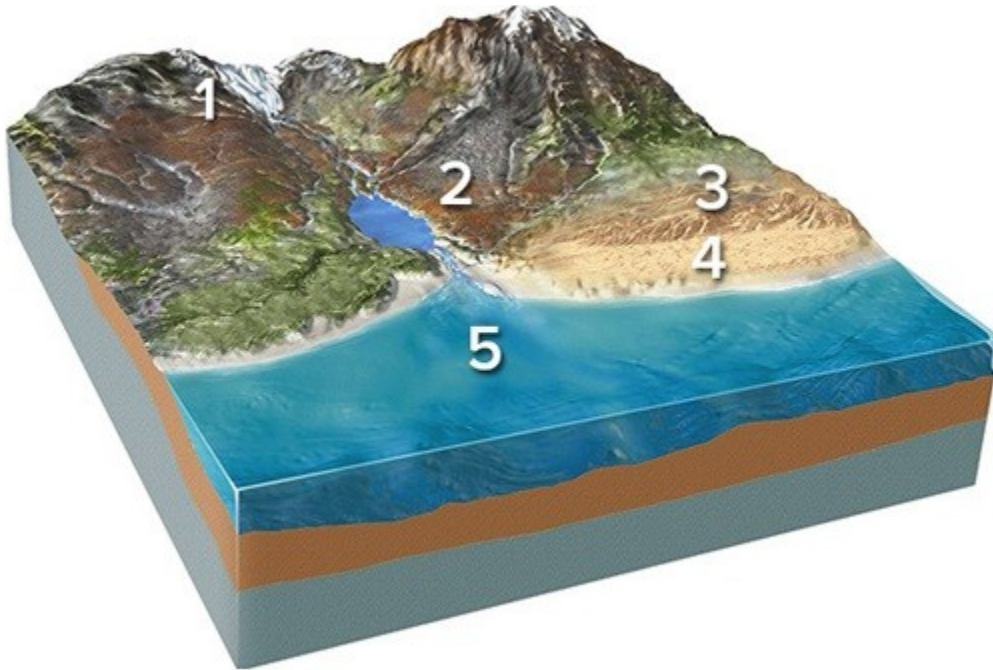
location 2, along a steep mountain front

location 3, in sand dunes

location 4, along a beach

location 5, on relatively deep seafloor

Which of the following locations would contain sand, rounded stones, and broken shells?



McGraw Hill Education

location 1, along the margins of a glacier

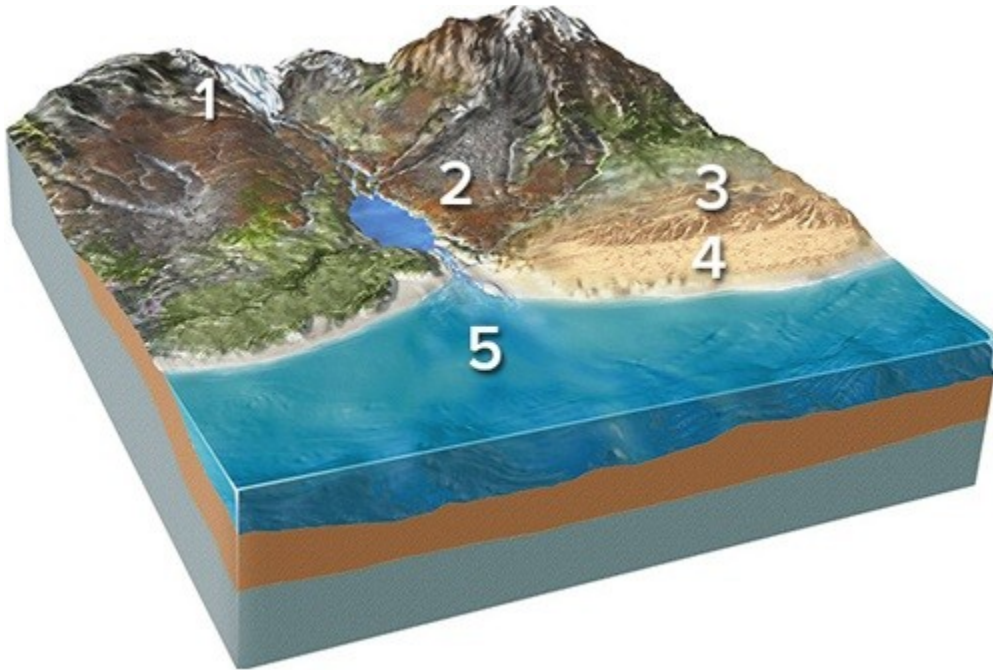
location 2, along a steep mountain front

location 3, in sand dunes

location 4, along a beach

location 5, on relatively deep seafloor

Which of the following locations would contain mud and the remains of small creatures?



McGraw Hill Education

location 1, along the margins of a glacier

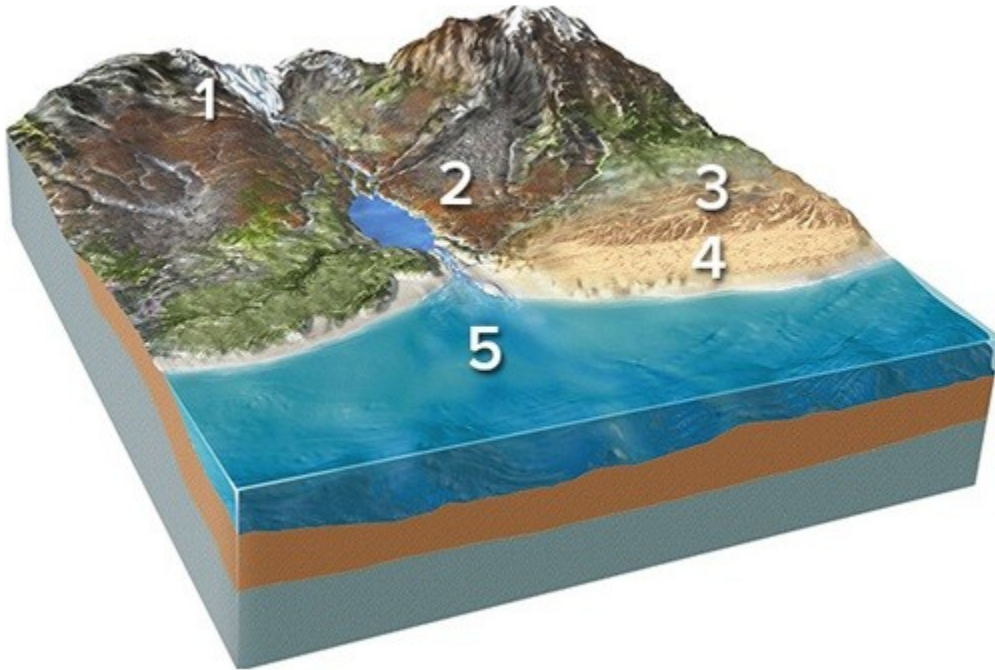
location 2, along a steep mountain front

location 3, in sand dunes

location 4, along a beach

location 5, on relatively deep seafloor

Which of the following locations would most likely contain large, angular rocks?



McGraw Hill Education

location 1, along the margins of a glacier

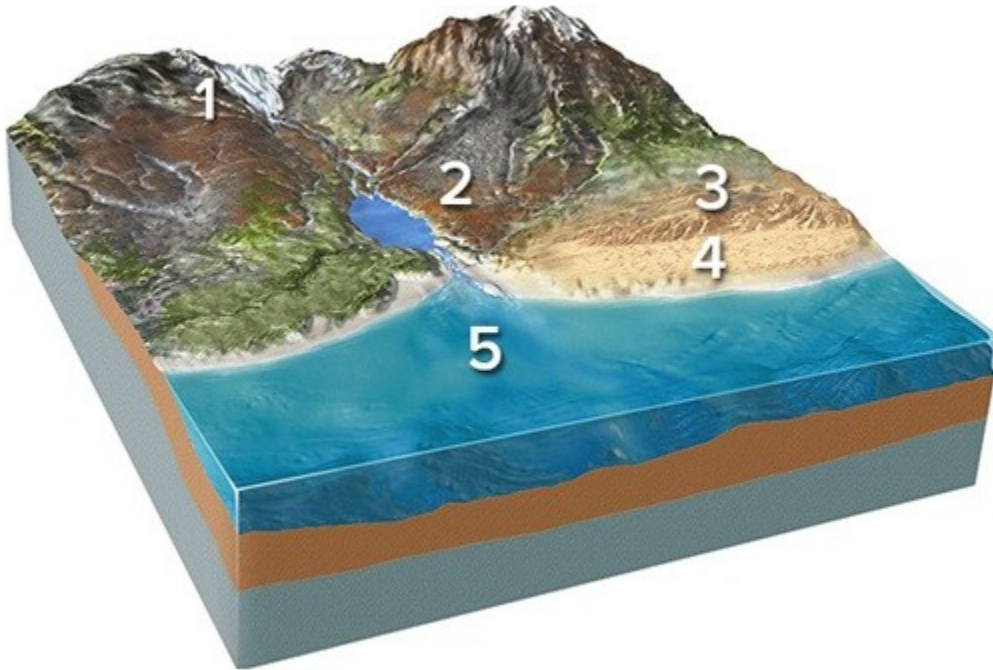
location 2, along a steep mountain front

location 3, in sand dunes

locations 1 and 2

locations 2 and 3

Which of the following locations would most likely contain a high percentage of sand?



McGraw Hill Education

location 2, along a steep mountain front

location 3, in sand dunes

location 4, along a beach

locations 2 and 3

locations 3 and 4

Which of the following surface environments is the most likely site for deposits in this photograph?



©Stephen J. Reynolds

steep mountain front

river channel

sand dunes

beach

lake bottom

Which of the following surface environments is the most likely site for deposits in this photograph?



©Stephen J. Reynolds

steep mountain front

glacier

sand dunes

beach

lake bottom

What type of rock would the materials shown in this photograph produce?



©Stephen J. Reynolds

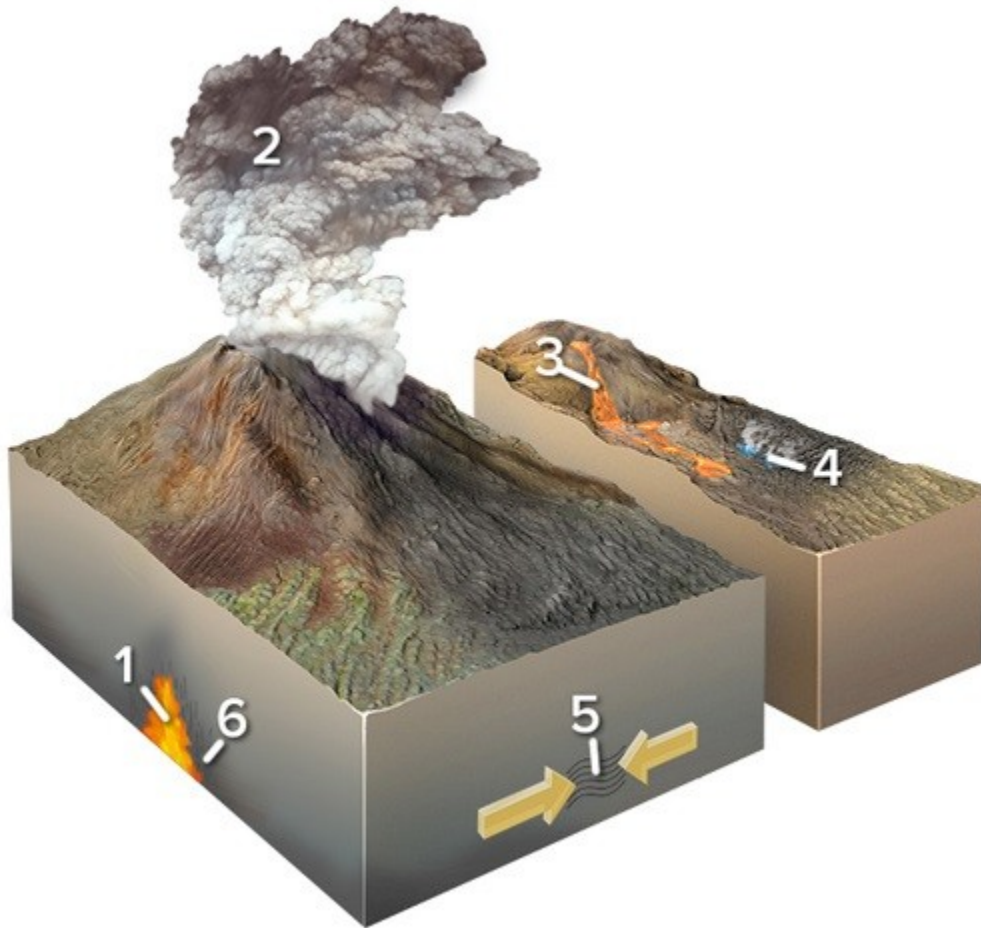
sedimentary

igneous

metamorphic

hydrothermal

Which of the following locations would form an igneous rock?



McGraw Hill Education

locations 1 and 2

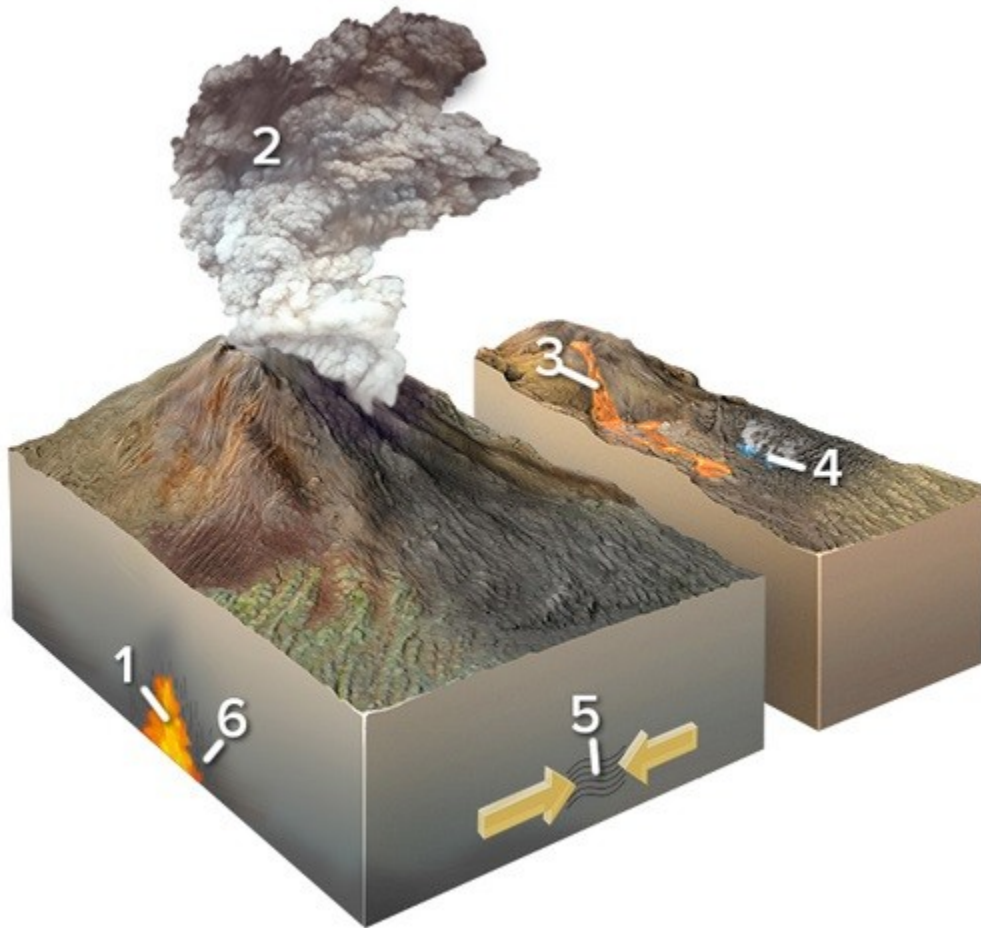
locations 2 and 3

locations 3 and 4

locations 1, 2, and 3

locations 5 and 6

Which of the following locations would form a metamorphic rock?



McGraw Hill Education

locations 1 and 2

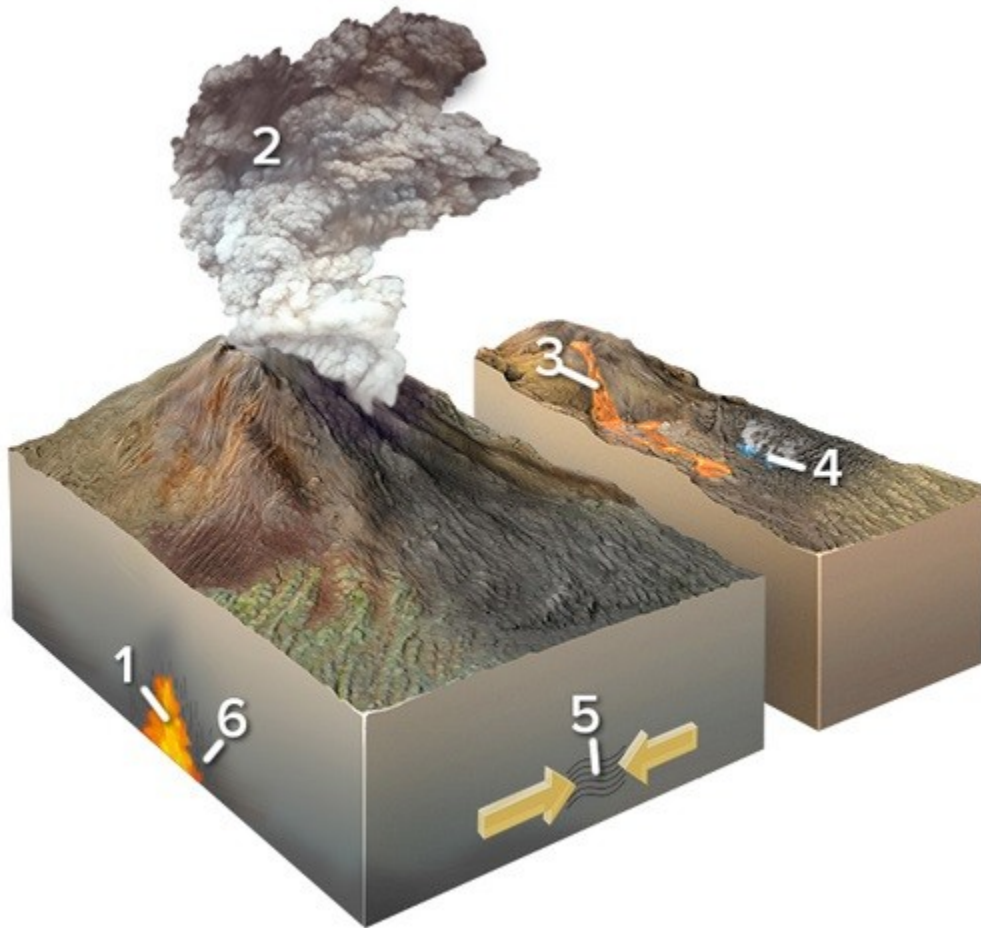
locations 2 and 3

locations 3 and 4

locations 1, 2, and 3

locations 5 and 6

Which of the following locations would form a hydrothermal rock?



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location 1

location 2

location 3

location 4

locations 2 and 3

Which of the following is NOT a typical environment in which a metamorphic rock forms?

solidification of lava

heating adjacent to underground magma

squeezing by tectonic forces

burial to great depths

Which of the following is NOT one of the main families of rocks?

sedimentary

igneous

metamorphic

meteorites

Which of the following is NOT a typical environment in which a sedimentary rock forms?

beside glaciers

river channels

heating next to a magma

deep seafloor

shoreline of a lake

Which of the following is NOT an environment in which an igneous rock forms?

explosive eruption of volcanic ash

cooling and solidification of lava

solidification of magma at depth

intense squeezing from tectonic forces

All these are conditions that form igneous rocks.

Rock that has formed from cooling magma or lava is

igneous rock.

metamorphic rock.

sedimentary rock.

Heat, pressure, and deformation are processes that can create metamorphic rocks.

igneous.

sedimentary.

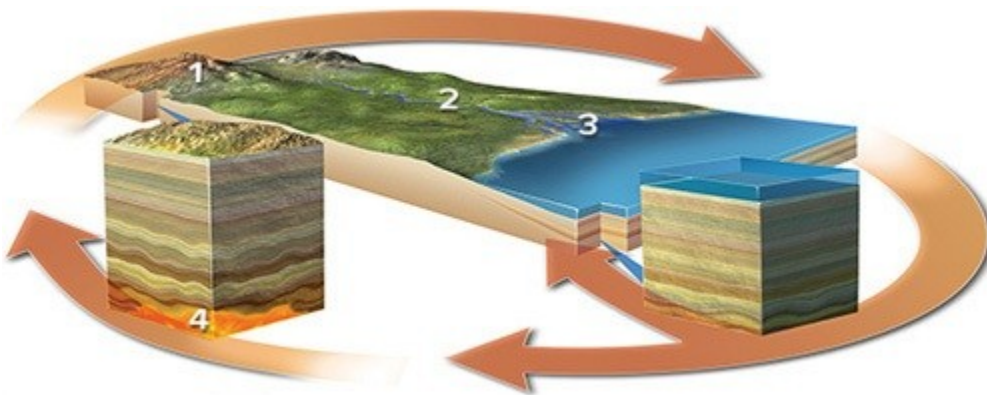
A type of rock that forms directly from precipitates of hot water is called a(n) hydrothermal rock.

sedimentary rock.

igneous rock.

Lava is molten rock that cools
on the surface.
underground.

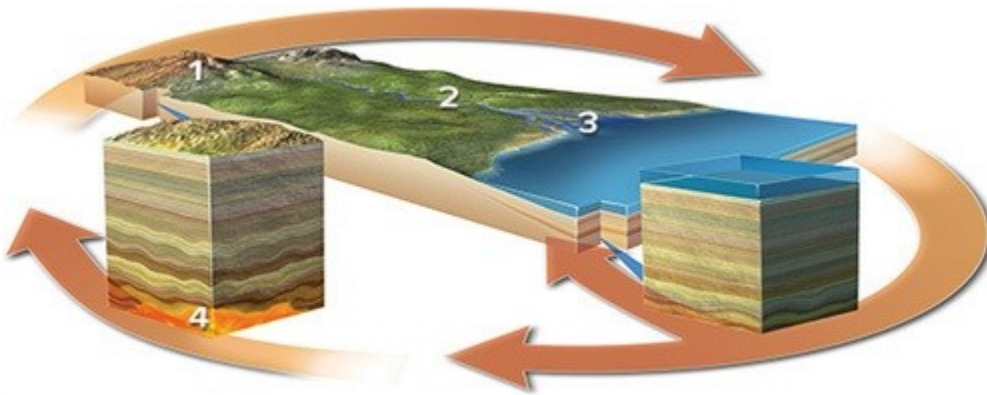
Which of the following locations would have weathering of bedrock or loose sediment?



McGraw Hill Education
location 1

- location 2
- location 3
- location 4
- locations 1 and 2

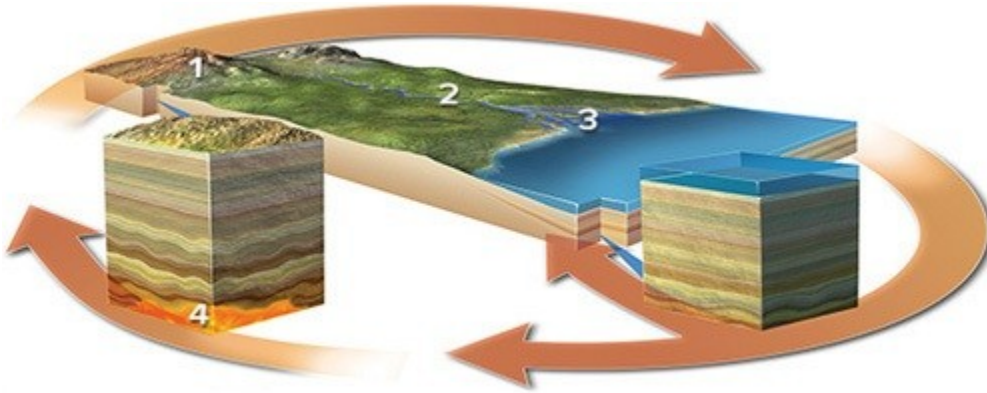
Which of the following best indicates a location where sediment is transported?



McGraw Hill Education

- location 1
- location 2
- location 3
- location 4

Which of the following best indicates a location where sediment is deposited but not eroded?



McGraw Hill Education

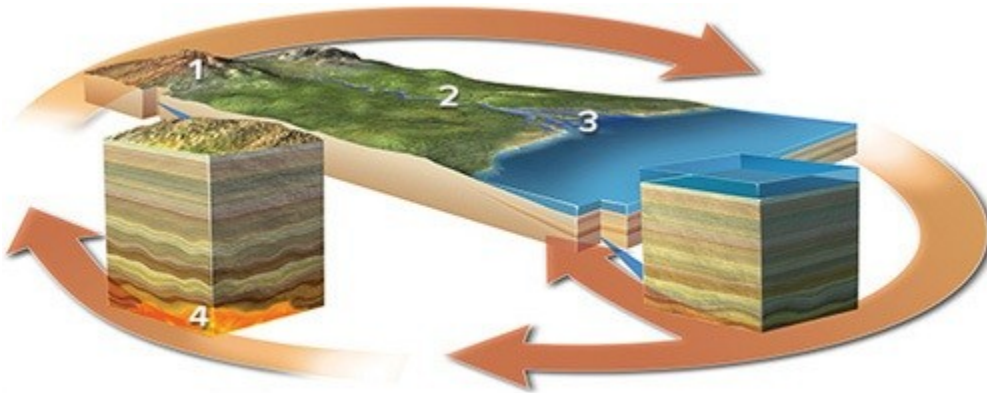
location 1

location 2

location 3

location 4

Which of the following settings would result in the formation of igneous rocks?



McGraw Hill Education

location 1

location 2

location 3

location 4

Which of the following does NOT list processes in an order consistent with a logical progression through the rock cycle?

weathering, erosion, deposition

solidification, melting, burial

erosion, deposition, burial

uplift, weathering, erosion

burial, metamorphism, melting

How are transportation and deposition of sediments related?

When transportation rates increase, deposition increases.

Deposition can only occur when the energy of transportation is zero.

Deposition occurs when the energy of transportation decreases to a certain level.

Deposition and transportation are not related.

What is lithification?

Sediment turning into rock

Rock turning into a liquid

Sediment settling down after being transported

Sediment being created from rock

Magma turning into rock

According to the rock cycle, sediment that is being transported by a river could become a metamorphic rock after

uplift and weathering.

melting and solidification.

deposition and burial.

solidification and uplift.

Uplift can occur during the rock cycle

only after deformation and metamorphism.

only after melting and solidification.

only after metamorphism or solidification.

at any point after burial.

The rock cycle shows that rock is transformed after partial melting during metamorphism into
magma.

sediment.

igneous rock.

If rock is exposed to enough heat after metamorphism it will eventually
melt into magma.

crystallize into magma.

weather into magma.

solidify into magma.

Magma is molten rock that occurs

on the surface.

underground.

Choose the answer that best explains why a rock might not go through the complete rock cycle.

The exposed rock may never weather thus never enter the rock cycle again.

Rock may be involved in a variety of processes in different sequences.

Some rocks are forever trapped in the magma of Earth.

The rock cycle was conceived by James Hutton in an attempt to explain how older rocks become new sediment.

Earth was formed.

sedimentary rocks are formed deep within Earth.

metamorphism occurs in surface environments.

Name the cycle that describes water processes that occur on land, in the atmosphere, and in the oceans.

hydrologic

rock

spin

life

Which locations are composed of loose materials (not bedrock)?



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1 and 2

2 and 3

3 and 4

1 and 3

2 and 4

Which location(s) have loose, angular rocks?



©Stephen J. Reynolds

1

2

3

4

1 and 2

Which locations contain rocks that are in place (part of the bedrock)?



©Stephen J. Reynolds

1 and 2

2 and 3

3 and 4

1 and 3

2 and 4,

Which locations consist of sediment rather than sedimentary rocks?



©Stephen J. Reynolds

1 and 2

2 and 3

3 and 4

1 and 3

2, 3, and 4,

What are some components of the landscape shown in this photograph?



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a natural stain on the outside of the rocks

fractures and layers

loose rocks covering a slope-forming unit

rounding of the upper parts of the cliff

All of these choices are correct.

Which of the following is NOT a recommended strategy for observing a landscape?

Observe the entire landscape first and then focus on smaller parts, one part at a time.

Examine complexities of each feature rather than grouping features into types.

Focus on one type of feature at a time, noting where this type of feature is present.

Examine relationships between different features.

The vertical black lines indicated in rock units #3 and #4 indicate what type of feature?



©Stephen J. Reynolds

fractures

beddings

slopes

loose rock

Rocks that are more resistant to erosion are more likely to create

cliffs.

slopes.

soil-covered areas.

Rocks that are easy to erode often create

slopes.

ledges.

cliffs.

Which of the following is NOT true about how water moves on our planet?

Rainfall can coat rocks and soil with a thin film of water, helping them to weather.

Moving water and its sediment can erode into solid rock, sculpting Earth's surface.

Groundwater typically rises towards higher areas where it emerges as springs.

Wind causes waves in the oceans and helps guide ocean currents.

Glaciers can transport sediment and carve the underlying landscape.

Of Earth's four overlapping spheres, which of the following is mostly located below the surface?

atmosphere

lithosphere

biosphere

hydrosphere

How do glaciers affect the landscape?

They really don't because they glide over the land on a thin film of ice.

Everything they encounter is pushed forward in front of the glacier.

They transport and deposit sediment and erode the land they move over.

Water that is located beneath Earth's surface

is stagnant.

is entirely tied up in mineral structures.

moves through cracks and spaces.

never makes it to the surface.

What gas makes up 78% of Earth's atmosphere?

oxygen

nitrogen

carbon dioxide

helium

hydrogen

Of Earth's four overlapping spheres, which of the following is (are) mostly between the lithosphere and atmosphere?

atmosphere

lithosphere

biosphere

hydrosphere

both the biosphere and hydrosphere

The uppermost part of the oceans, as expressed by normal ocean waves, are in constant motion due to the effects of the

wind.

ultraviolet radiation.

gravity.

tides.

The most important agent for sculpting the landscape is

flowing water.

blowing wind.

gravity.

wave action.

Which of these processes is the most apparent interaction of all four of Earth's spheres?

A river transporting sediments

Movement of sand in sand dunes

Glacial erosion

Plant transpiration

What system is comprised of the Sun, planets, their moons, and other bodies that orbit the Sun?

solar system

planetary system

galactic system

ecosystem

Compared to the outer planets in our solar system, the inner planets
are larger.

contain more gas.

are rocky and so are called terrestrial planets.

have better developed planetary rings.

have none of the properties described here.

The largest object in the solar system is

Earth.

Earth's Moon.

Saturn.

Jupiter.

the Sun.

Which of the following is considered one of the outer planets?

Mars

Jupiter

Venus

Moon

None of these choices are correct.

The closest object to Earth is (the)

Moon.

Sun.

Venus.

Mars.

The Moon and Sun cause the tides in Earth's oceans because of
gravity.

heat.

magnetic pull.

What is the most common type of atoms joined together in a process called nuclear fusion?

oxygen

nitrogen

carbon

hydrogen

Rocky fragments left over from the formation of the solar system are called
asteroids.

plutoids.

galaxies.

Earth's orbit around the Sun is almost circular. Therefore, Earth receives about the same amount
of year-round _____.

heat and light

heat and precipitation

light and precipitation

The planets orbit the Sun in a(n) _____ path.

elliptical

oval

nearly circular

perfectly circular

Seasons on Earth are caused by _____.

Earth being farther away from the Sun at certain times of the year

Earth's axial tilt

changes in solar output

ocean currents and atmospheric pressure zones

Which of the following is a way that geology influences Rapid City and areas of the Black Hills, either presently or in the past?

flooding along creeks that drain the Black Hills

tilted rock layers that control the steepness of slopes

tourism from presidents' faces chiseled into granite

large gold deposits

All of these choices are correct.

The main cause of the Rapid City flood of 1972 was

rapid melting of glaciers in the Black Hills because of global warming.

failure of a dam because of a large landslide into the reservoir.

poor design and poor construction of a large concrete dam.

intense rainfall from a thunderstorm that resulted in a flash flood.

All of these choices are correct.

Mt. Rushmore is composed of which type of rock?

granite

sandstone

magma

basalt

Devils Tower was formed by

solidification of a magma chamber.

sedimentation from river deposits.

accumulations of windblown sand.

What is the orientation of the sedimentary rocks surrounding the older igneous and metamorphic rocks in the Black Hills?

The sedimentary rocks slope in toward the older rocks.

The sedimentary rocks slope away from the older rocks.

The sedimentary rocks are flat-lying, i.e., they are horizontal.

Answer Key

Test name: Ch1_Exploring Geology_6e

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