

<b>Grade 8</b>				
<b>Ch. 10 Lesson 1</b>				
<b>Earth and Space Science</b>				
<b>Page #</b>	<b>Question</b>	<b>Answer(s)</b>	<b>Links/Sources</b>	<b>Student Resources</b>
364	How can scientists use features on Earth's surface to learn about Earth's history?	Features in the surface of the Earth can give evidence to changes that have occurred, and fossils can give information about organisms that no longer exist or have changed.		
365	How have thick sheets of glacial ice affected Earth's surface?	Sample answer: Glaciers have worn off jagged mountains scooped out large valleys, and deposited huge amounts of boulders, rocks, gravels and sand in many places completely <u>changing the original shape of the land</u>		
365	How much of the Earth's surface has been shaped by glaciers?	Sample answer: Almost every continent has evidence of glacial activity.		
365	What features do glaciers form?	Sample answer: Glacial features include - U-shaped valleys, cirques, moraines, glacial till, glacial erratics, glacial striations.		
366	How can the inner core be solid despite extremely high temperatures?	Sample answer: The iron and nickel in the core are under pressure from the rest of the planet pressing on them. The pressure is so great that despite extreme temperatures the core doesn't melt.  Note: New information has been discovered and published concerning the Earth's inner core. Let students conduct research to discover new ideas <u>about Earth's inner core</u>	<a href="https://www.livescience.com/earth-core-superionic">https://www.livescience.com/earth-core-superionic</a>	
366	Do you think Earth looks the same today as it did when God created it?	Sample answer: No.		
366	In what ways do you think our planets has changed throughout history?	Sample answer: I think the size of the oceans and continents have changed and that they are not in the same place they once were. I think mountains have been pushed up and deposits of sediments have changed the topography of Earth.		
366	What if any of the Earth's structure have remained the same?	Sample answer: Possible the core has stayed the same.		
367	What type of evidence do you think scientists are looking for to confirm or disprove the theory of plate tectonics?	*Answers will vary. Accept well thought-out ideas, such as, evidence from earthquakes, volcanoes, core samples, and seafloor spread.		
367	Which of God's activities described in Proverbs 8:27-29 might relate to this section?	*Answers will vary: Establishing the heavens, setting the boundary for the sea, marking out the foundations of the Earth, and mighty acts of Creation are described in Proverbs 8:27-29.		

367	If a plate moves an average of 4 cm/yr, how long will it take to move 1m?	*It would take 25 years to move 1m.		
367	What might speed this process up?	*Sample answer: A natural event such as a volcanic eruption or an earthquake. Note: Such events would only move a portion of the plate, it is unlikely that the entire plate would move under these circumstances. Plate movement is due to much greater forces than this. The amount of plate movement is closely related to the time the pulling pressure or colliding pressure has been building up. It is more likely that volcanoes and earthquakes result from plate movement rather than cause plate movement. It is possible that the Genesis flood may have contributed to plate movement.		
367	Which plate would result in great geologic change -- the Pacific Plate or the North American Plate. Explain the reason for your answer.	Sample answer: I think the Pacific Plate would cause the greater geologic change because it is much larger than the North American plate and it is subducting under the North American plate causing more earthquakes and volcanoes on the North American plate.		
368	How can scientists determine where a boundary exists and what type of boundary is there?	*Scientists study earthquakes, which usually only happen where plates meet. By looking at the movement of the crust they can determine what type of boundary is at a certain location.		
369	Where will the candy bar break when it is pulled apart?	Sample answer. Near the middle.		
369	How have the Earth's plates moved in the past?	Sample answer: Some plates have changed their direction of movement and their speed of movement.		
370	Do you think these time estimates are based on catastrophism or uniformitarianism?	*Uniformitarianism.		
370	Can you tell anything about the worldview that may have influenced these conclusions?	*Sample answer: The millions of years in their conclusions tells us they are outside the biblical time frame of thousands of years.		
370	What other possibilities could be suggested to explain the formation of supercontinents?	*Sample answer: Perhaps the violent events of the worldwide Flood impacted the continents. Emphasize that this is an interpretation of data based on a biblical worldview.		
370	How might this be related to what you have been reading?	Sample answer: Genesis 7-11 tells the story of the Flood and the events immediately following it. Perhaps God created one giant continent in the beginning that broke apart during the Flood.		

370	How long do sediments take to settle out of the water once they stop moving?	Answers will vary. Students should see larger pieces settle out first; smaller pieces will take longer. They should conclude smaller sediment would be found farther away from continents <u>because it stays suspended longer.</u>		
370	Do you think these time estimates are based on catastrophism or uniformitarianism?	Sample answer: Uniformitarianism.		
370	How do you think these time estimates were calculated?	Sample answer: By measuring the current rate of plate movement and using these measure to calculate time.		
370	Can you tell anything about the worldviews that may have influenced these conclusions?	Sample answer: The millions of years in these conclusions tells that an acceptance of the idea of uniformitarianism influenced them and that they are made outside of a Biblical worldview that involves thousands rather than millions of years.		
370	What other possibilities could explain the formation of a super continent?	Sample answer: The supercontinent may have been formed at the time of Creation.		
370	Why are some sediments transported only a short distance?	Sample answer: There are two possible reasons. One may be because the sediments are too large to be transported a great distance or, the current is not strong enough to carry the sediments very far.		
370	In what order did the sediments settle?	Large sediments on the bottom and then smaller and smaller sediments deposited one on top of the other ending with the smallest sediments on top.		
370	Did all the sediments settle out? Why or why not?	No. Some sediments are so small the stay suspended. Eventually, in time most of these will settle out.		
370	How could you decrease the time for the turbidity to clear?	Sample answer: You could use filters to filter out the water above the sediments.		
370	How long do you think the water will take to become as clear as it was at the beginning of the activity?	Sample answer: I think it will take at least one week of the water being complete undisturbed.		
370	Where would you expect to find the finest sediments on the ocean floor: near the edge of the continents or out away form the edges of the continents? Explain.	Sample answer: I expect the finest sediments would be found on the ocean floor far from the edges of the continents, because these sediments stay suspended and take longer to land on the bottom because they travel a longer time.		
371	How do you think water might play a role in the formation of caves:	*Sample answer: Water flows into cracks of the land and erosion occurs.		

371	How can mass movement affect different ecologically catastrophic events?	*Sample answer: If a mass movement such as a landslide occurs by a river, the rock and sediment could dam the river. A lake will form behind the dam. If the dam bursts, the lake will drain, causing flooding.		
371	What are eskers?	*Eskers are long, winding ridges of stratified sand and gravel deposited by glaciers.		
371	What are moraines?	*Moraines are composed o soil and rock deposited by a glacier and are not stratified.		
372	What geologic processes might explain why these layers are no longer horizontal?	*Sample answer: Referring to the Types of Boundaries chart on page 368, converging oceanic crust could collide with a continental crust to two continental plates could have collided pushing the layers up. The Himalaya Mountains are an example of this.		
372	How does this photograph show and example of the principle of original horizontality?	*Sample answer: The lines on the rocks are horizontal.		
372	What processes during or after the flood might have caused certain rock layers to be uplifted?	Sample answer: Two plates could have collided and lifted up the land, or a major earthquake that occurred could have tilted the land.		
372	Could these geographically widespread layers be formed by the kinds of geologic processes we see at work in the world today?	Sample answer: It is unlikely that today's processes could have cause these widespread layers.		
372	What do you think is represented by the top line of the diagram being wavy instead of flat?	*Sample answer: Some type of erosion is happening to the top layer.		
372	Is there any way to know how long those book/papers have been there?	*Sample answer: If someone saw you stack the books/paper, we could tell; we could narrow it down to a particular time period by certain clues.		
372	What is the oldest?	*The granite is the oldest.		
372	Is an intrusion always younger or older than the rock layers around and beneath it?	The intrusion layer is always younger than the rock layers around and beneath it		
372	What type of events in Earth's history might lead to large amounts of rock or sediment being eroded?	Sample answer: Floods, strong winds, earthquakes, tsunamis, etc.		
372	Were there any layers of rock deposited after the igneous dike formed?	Yes.		
372	What type of unconformity is shown	A disconformity is shown between layers 4 and 5.		
372	Which layers show significant erosion?	Layer 4 and layer 7.		
372	Which layers show no apparent erosion?	Layers 2, 3, 5, and 6.		

372	Is it possible that originally there were more layers of rock than shown in the diagram? Explain.	Sample answer: There could have been one or more layers on top of layer 4 that eroded away before layer 5 was deposited. You can see that part of layer 4 is eroded. It is very possible that another layer above it was completely eroded away.		
374	What is the difference between magma and lava?	*Molten rock is referred to as magma when it is beneath the Earth's crust, and is referred to as lava when it reaches the surface.		
374	If scientists came upon this bulge and had no information from other scientists, how might scientists explain the bulge (before it erupted)?	*Sample answer: Material deposited over a long period of time may form a bulge or materials being pushed up from below may form it.		
374	How is a volcanic mountain such as this formed?	*By alternating eruptions of ash and lava.		
374	What might cause a growing bulge on the side of a volcanic mountain?	Sample answer: An upwelling of magma and/or a build up of gas underneath the crust.		
375	Why is the eruption of Mount St. Helens such an important geologic event?	*The eruption dramatically changed the landscape in less than one day. It showed scientists that the formation of strata does not always happen over long periods of time.		
375	Do you think the type of geologic events associated with this eruption are unique to Mt. St. Helens? Why or why not?	*Sample answer: No, because other places in the world have recorded rapid changes to the landscape caused by natural events.		
375	What do these events teach us about other geological structures?	*Sample answer: We can't assume that the structures formed in a uniform method that took thousands of years, so we can only hypothesize about Earth's history.		
375	What does Mount St. Helens reveal about the rate of some geologic events?	*Sample answer: They can form very rapidly.		
375	How much time would it have taken for the deposits of the Grand Canyon to form?	*The average depth of the Grand Canyon is 1.6 km. Help students convert 1.6 km to meters. Using the information that the deposition rate of Mt. St. Helens is 8 m/3hr calculate as follows: $8\text{m} \div 3\text{hrs} = 1600\text{m} \div x$ ; $x = 600\text{ hrs}$ or 25 days.		
375	Why is this important?	Sample answer: Deposits of sediments can form very rapidly.		
376	What can scientists learn from this geologic event?	*Just as volcanic eruption of Mount St. Helens changed the area quickly, the mudflow also made a major change to the area.		
376	How can scientists use their understandings of these two geological events to understand geological formations?	*They may conclude that other formations may have been formed in a short amount of time rather than over long periods of time as once believed.		
376	How does the formation of the little Grand Canyon provide an alternative explanation of other canyons?	*Sample answer: Millions of years aren't needed to carve out canyons.		

376	What does Psalm 29:10 say about the Flood?	*Psalm 29:10 says that the Lord sat enthroned at the Flood.		
376	If the Little Grand Canyon was carved out in a day, how quickly might the real Grand Canyon been carved out?	Sample answer: It may have been carved out much more quickly than it is believed by many to have been carved out.		
376	If we know a canyon can be carved out in a day, what kind of erosion might have been caused by months of receding floodwaters?	Sample answer: The receding floodwaters could have eroded tremendous amounts of material in a short time.		
377	Why did the crater at Mount St. Helens form so much more rapidly than the Grand Canyon?	*Sample answer: The eruption of Mount St. Helens was an explosive event. The carving of the Grand Canyon was due to erosion, which is generally a slower process.		
377	Why did strata form around Mount St. Helens after the eruption?	*Different materials erupted out of or flooded down the side of the volcano at different times. The sequence of events determined the sequence of each layer.		
377	One of the changes that occurred after Mount St. Helens erupted was that the nearby Columbia River began to flood. Why might this have happened?	*Sample answer: Sediment from the eruption traveled to the river bed, raising the water level.		
	* Means the answer is found in the TE.			