

## 4th Grade

### Earth & Space Science

#### Chapter 8 Lesson 1

Page	Question	Answer(s)	Links/Sources
263	How does a rock change from one type of rock to another type of rock?	Heat and pressure must be applied to it.	
263	How did applying pressure to the sedimentary rock change it?	It turned lots of little pieces into one big multicolored piece.	
263	Why has a hot plate needed to make a model igneous rock?	You needed to add heat so the small pieces would actually melt together.	
264	What precious stone make up the foundation of New Jerusalem?	Jasper, Sapphire, Agate, Emerald, Onyx, Ruby  Chrysolite, Beryl Topaz Turquoise, Jacinth, Amethyst	Revelation 21:19-21.
264	What minerals would topaz be able to scratch?	Since topaz has a hardness level of 8, anything below this will be scratched by topaz.	See chart 1 Talc 2 Gypsum 3 Calcite 4 Fluorite 5 Apatite 6 Orthoclase 7 Quartz
266	Explain where an igneous rock with large crystals must have been formed.	Large crystals in rock, like granite, it is believed to have formed deep under the surface of the earth where elements were allowed to cool slowly while under pressure. This combination, according to the theory, gives the crystalline structure the environment it needs to solidify.	
267	Why are pumice and obsidian different?	Pumice had a lot of gas bubbling through it when it solidified. Obsidian was super hot, had virtually no gasses escaping from it and cooled very quickly.	

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267	How were stones used in this story?	Different stones were used to represent the 12 different tribes of Israel.	Joshua 4:1-4.
267	How can you tell which mineral in a group is the hardest?	In a group of 3 – A,B,C: A scratch B? A scratch C? B scratch A? B scratch C? C scratch A? C scratch B? Only one mineral will score two scratches. That is the hardest. The one that scores zero scratches is the softest.	
268	What characteristics of a rock describe what God is like?	God is a fortress; He does not erode like the sand. God is a stronghold; He can stand up to heat and pressure. God is a refuge; like the hardest of rocks, God cannot be changed by circumstances.	2 Samuel 22:2-3
268	Does the rock cycle always follow the same sequence?	No. For example the Metamorphic/Sedimentary Rock circuit may cycle through a thousand times before those same elements experience melting and cooling to create an igneous rock.	
269	Explain the differences and similarities between Sandstone and Quartzite.	Sandstone is sedimentary. Quartzite is metamorphic. Sandstone rubs apart easily and isn't very strong. Grains of sand are probably indistinguishable in Quartzite and you can build with it.	
269	Explain some processes that could have made a river rock smooth.	Many answers possible. For example, sandstone could have heated up into quartzite, then thrown into a river by a volcanic blast, then the water tumbled the jagged edges off to create a round stone.	

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269	What does the house on the rock represent?	Basing your life on the teachings of Jesus and making decisions based on what He would do, rather than on the personal emotions of the moment.	Matthew 7:24-28
270	What process must occur before a metamorphic rock can change into an igneous rock?	The metamorphic rock must melt then cool down again into a solid.	
271	#3 Which of these is a sedimentary rock made up of the same ingredients as the metamorphic rock quartzite?	C. Sandstone	
271	#4 Why can't the Mohs scale be used to identify rocks?	Mohs scale only works on single minerals. Rocks are composed of many different minerals.	
271	#5 Explain why obsidian doesn't have air pockets like pumice.	Obsidian must have cooled further down the lava flow after the gasses had escaped from molten elements.	
271	#6 Explain how sedimentary rocks are formed from igneous rocks.	Igneous rocks must undergo weathering that breaks them down into smaller pieces. This weathering can occur by rain, snow, ice, animals, plants or chemical changes. Then the smaller pieces settle together and if pressure is applied for long enough, the small pieces of rock will bind together to create a new, larger, sedimentary rock.	