

List of Big Ideas

days 1 & 2

- The world we live in gradually emerged over about 4.6 billion years.
- Humans have only existed for a tiny fraction of that time.

day 3

- The world we live in gradually emerged over about 4.6 billion years.
- The Grand Canyon only formed about 10 million years ago, but its rocks reveal geologic events that happened as many as 1.7 billion years ago.
- Earth's history is also recorded in fossils.

day 4

- Earth's history is divided into eons, eras, and periods based on major changes that occurred at those times.

day 6

- Both rocks and minerals are naturally formed solids.
- Minerals are elements or compounds.
- Rocks are mixtures that usually contain minerals.

day 7

- A mineral is a naturally formed, inorganic solid that has a definite crystalline structure.

day 8

- Properties like luster, streak, cleavage, and fracture can be used to identify minerals.

day 9

- Properties like hardness and density, and special properties like magnetism and radioactivity can be used to identify minerals.

day 11

- A mineral's properties are determined by how it forms and what it is made of.

day 12

- Reclamation reduces the harmful effects of mining by returning land to its original condition after mining is completed.

days 13 & 14

- There is heat and pressure inside the Earth, and they get more and more extreme the deeper you go.
- The Grand Canyon only formed about 10 million years ago, but its rocks reveal geologic events that happened as many as 1.7 billion years ago.
- Igneous rocks form when molten rock cools and hardens.
- Sedimentary rocks form when particles settle and get compacted and cemented together. (day 14 only)

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day 16

- Igneous rocks form when molten rock cools and hardens.
- Magma forms when solid rock melts.

day 17

- Intrusive igneous rock forms beneath Earth's surface, where the temperature is hot and cooling is slow.
- Extrusive igneous rock forms at or near Earth's surface, where the temperature is cooler and cooling is fast.

day 20

- Sedimentary rocks form when particles settle and get compacted and cemented together.
- Sedimentary rocks form at or near Earth's surface.
- The particles that make up sedimentary rocks can be fragments of other rocks, minerals that are dissolved in water, or the remains of organisms.

day 21

- Sedimentary rock formations contain layers, or strata, which form through a process called stratification.

day 22

- When particles settle, the heaviest particles tend to settle first, and the lightest particles tend to settle last.

day 23

- Metamorphic rocks form when an existing rock changes because of heat and/or pressure.
- Metamorphic rocks form deep beneath Earth's surface, where heat and pressure get more and more extreme the deeper you go.

day 24

- Igneous rocks form when molten rock cools and hardens.
- Sedimentary rocks form when particles settle and get compacted and cemented together.
- Metamorphic rocks form when an existing rock changes because of heat and/or pressure.
- Weathering is when rocks break apart to form small pieces or bits.
- Erosion is when something like water or wind picks up loose bits of rock.
- Transport is when the water or wind carries the bits of rock to another place.
- Deposition is when the water or wind slows down and the loose bits settle.
- The rock cycle is a series of processes that cause rocks to change from one type to another.
- Depending on what happens to it, any type of rock can change into any other type of rock.

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day 26

- Metamorphic rocks form when an existing rock changes because of heat and/or pressure.
- When metamorphic rocks are forming, increased pressure can prevent them from melting.

day 27

- Metamorphic rocks form when an existing rock changes because of heat and/or pressure.
- Sometimes heat and pressure will cause the minerals in a rock to combine and form new minerals.

day 28

- Deformation is a change in shape that happens when heat and pressure cause a rock formation to fold, bend, or twist.

day 29

- When a rock is changing because of pressure, its grains tend to line up with each other.

day 31

- Weathering is when rocks break apart to form small pieces or bits.
- Erosion is when something like water or wind picks up loose bits of rock.
- Transport is when the water or wind carries the bits of rock to another place.
- Deposition is when the water or wind slows down and the loose bits settle.
- Uplift is when movements inside the Earth push rocks to the surface.
- The rock cycle is a series of processes that cause rocks to change from one type to another.
- Depending on what happens to it, any type of rock can change into any other type of rock.

day 32

- The rock cycle is a series of processes that cause rocks to change from one type to another.
- Depending on what happens to it, any type of rock can change into any other type of rock.

day 33

- Rocks can be classified by composition, which is the minerals and other materials that make up a rock.
- Rocks can also be classified by texture, which is the size, shape, and arrangement of the grains that make up a rock.

List of Big Ideas

day 36

- Based on composition, the Earth has three layers – crust, mantle, and core.
- The core is the densest layer, and the crust is least dense.

day 37

- Based on physical properties, the Earth has five layers – lithosphere, asthenosphere, mesosphere, outer core, and inner core.

day 38

- The lithosphere is the rigidly solid outer layer of the Earth that consists of the crust and upper mantle.
- The lithosphere is divided into pieces called tectonic plates.

day 39

- Continental drift is the hypothesis that the continents once formed a single land mass, and they broke apart and drifted to their present locations.
- Sea-floor spreading is when new oceanic crust forms as tectonic plates move apart and magma rises and solidifies.

day 41

- When part of a fluid is warm and part is cool, the warm part rises and the cool part sinks.
- This results in a motion cycle called a convection current.

days 42 & 43

- Convection currents in the mantle cause tectonic plates to move.
- Divergent motion is when plates move apart, and convergent motion is when they move toward each other.
- Divergent boundaries form when plates move apart, and convergent boundaries form when they move toward each other.

day 44

- Based on physical properties, the Earth has five layers – lithosphere, asthenosphere, mesosphere, outer core, and inner core.
- The lithosphere is the rigidly solid outer layer of the Earth that consists of the crust and upper mantle.
- Convection currents in the mantle cause tectonic plates to move.
- Tectonic plates move very slowly, no more than a few centimeters per year.

days 45 & 46

- The movements of tectonic plates can cause rock layers to bend or break.
- When a rock layer breaks and forms two blocks of rock that grind past each other, the surface where they meet is called a fault.

List of Big Ideas

day 49

- Many earthquakes and volcanoes are caused by the movements of tectonic plates.

day 50

- Most earthquakes happen near the edges of tectonic plates because the moving plates grind against each other.
- Grinding plates can cause rock to change shape and, when it bounces back to its original shape, energy is released that causes an earthquake.

day 51

- Earthquakes release energy in seismic waves that travel away from the epicenter in all directions.

day 52

- A volcano is an opening that allows magma and gases to flow out onto Earth's surface.

day 53

- Magma that contains a lot of water or silicon tends to cause explosive eruptions.

day 54

- Magma erupts as either lava (liquid) or pyroclastic material (solid).
- Pyroclastic material can range in size from huge boulders to tiny particles of volcanic ash.

day 56

- Eruptions release large amounts of ash and gases that can block sunlight and cause global temperatures to drop.

day 57

- Eruptions can cause drastic changes in Earth's surface.

day 58

- Magma often forms near the edges of tectonic plates, where pressure decreases enough to lower rock's melting point to its current temperature.
- Once formed, magma rises toward the surface because it is less dense than the surrounding rock.

day 59

- Mid-ocean ridges form at divergent boundaries.
- When ocean crust sinks at convergent boundaries, it releases water that mixes with the surrounding rock and lowers its melting point.