

Year End Science Review

What is matter?

- Everything around us that has
 - volume (takes up space)
 - mass (made of atoms)
 - Weight (heaviness)

Why can't matter really be created or destroyed?

- All matter already exists, it just changes form or state

What are physical properties of matter?

- Color
- Hardness
- Roughness
- Size
- Shape
- How it looks
- How it behaves

What is a physical change in matter?

- A physical change is when matter changes in some way without changing the substance
- Mixtures and solutions are physical changes

List examples of physical changes

- Sharpening a pencil
- Freezing water
- Water boiling then evaporating
- Tearing paper
- Wax melting
- Melting butter
- Kool-aid and sugar dissolved in water
- Salt dissolves in the ocean
- Oil spill in the ocean

When a physical change happens, what happens to the weight of the substance?

- The weight remains the SAME

Describe a solid, liquid, and gas

- A solid has a definite shape and volume. The particles are close together and fixed. They vibrate slowly.
- A liquid takes the shape of its container, but it has a definite volume. The particles are close together, but they are mobile, so they flow.
- A gas fills the space available and takes the full space of its container. The particles are far apart and move freely.

What is a chemical change?

- When two or more substances combine and form an entirely new substance.

What are signs of a chemical change?

- A gas is created (bubbles form)
- Unexpected temperature change (hot or cold)
- Light is given off (it glows)
- Odor is given off (it smells)
- Something burns
- Unexpected color change
- Precipitation (a solid is formed in a solution)
- A new substance is made that cannot easily be reversed

What are examples of chemical changes

- Vinegar and baking soda combine and a gas is given off (it bubbles)
- Baking cookies or cake
- Burning wood
- Burning a candle
- Rocket launching or Gas powering a car
- Copper turning green
- Rusting
- Digesting food

When a chemical change takes place, what happens to the weight?

- When the substances combine, the combined weight stays the SAME.

When a penny turns green, its a

- Chemical change

When a paper has been torn,
how does its weight change?

- It stays the same

When you break a
wire in half, it is a

- Physical change

If we combine vinegar and baking soda in a water bottle with a balloon attached to the top what will happen?

- The balloon expands like it is being blown up because the vinegar and baking soda creates a gas that fills up the balloon.
- The balloon traps the gas and inflates.

How much solid shortening
would you need to get 8 ounces
of melted shortening?

- 8 ounces

Why does a candle weigh less after it is burned?

- Some of it became a gas when it burned.

What happens when water freezes?

- Physical change

What happens when water is heated and evaporates?

- Physical change

When a shovel is left out in the weather, how do you know if a chemical change has happened to it?

- Unexpected color change from rusting, which is a chemical change.

What are we studying when we study genetics and heredity?

- The process of traits being passed from parent organisms to offspring.

In what way will a kitten
look like its parents?

- The kitten will have the same body structures.

Name at least 5 traits a dog would inherit from its parent.

- Two eyes
- Two ears
- A nose
- Hair/fur
- Same number of legs
- Size
- A Tail
- Facial structure

Name human characteristics that will vary depending on the traits of your parents or grandparents.

- Hair color
- Skin color
- Curly or straight hair
- Eye color
- Height
- Attached or unattached earlobes
- Ability to curl your tongue
- Hitchhiker's thumb

A butterfly lays an egg that turns into a caterpillar.

- How do you explain the fact that this offspring looks so different from its parent?
- During the life cycle of the butterfly, it changes from a caterpillar to a butterfly.
- A tadpole changes to look like its parent the frog.
- A mealworm changes to look like its parent the darkling beetle.

Name a specialized structure an animal has that helps it survive in its environment.

- Deer legs- can run fast to get away from predators
- Scorpion's tail for defense and to catch prey
- Polar bear's hollow fur for camouflage and insulation
- Giraffe's long neck to eat food at the top of trees

If a panda bear is raised at a zoo, where it is always given food, would it be able to survive and find its own food if it were released in the wild?

- No, the ability to hunt in the wild is **LEARNED** from an animal's parents

Polar bears from the Arctic have thick fur. What advantages does this give bears?

- They stay warmer in the cold climate.

Name 2 adaptations desert animals have made to survive.

- They are active at night rather than during the day
- They live in burrows underground

Give an example of an animal instinct.

- Salmon migrate upstream to spawn
- A cat purrs
- A duck swims
- A spider spins a web
- A termite eats wood
- Sea turtles return to the sea after hatching

How has the knowledge of genetics changed our food supply?

- Scientists have produced faster growing plants with better looking and better tasting fruit.
- Improved quality and variety of tomatoes, corn, and apples, etc.
- Better producing milk cows, faster growing pigs, etc.

How is geologic time measured?

- In millions of years (mya)

Which geologic period of time do we know the most about?

- The last 65 million years or cenozoic era

What are some types of erosion?

- Wind, storms: hurricanes & tornadoes
- Water, rivers, rain, ocean waves
- Ice, snow, hail, sleet, glaciers
- Plants, animals, people
- Gravity

What are the types of weathering?

- Physical weather- breaking rock into sediment
 - ice, water, wind, abrasion
- Chemical weather- changing minerals that make up rock
 - Rusting-oxidation, acid rain

What's the strongest type of erosion?

- Ice erosion

Many valleys in Northern Utah are u-shaped, which shows a glacier carved them. How long does it take a glacier to carve a valley?

- Thousands, even millions of years

Which type of erosion moves the most rock on Earth's surface?

- Water erosion

How long did it take for water and wind to carve the Grand Canyon?

- Water and wind carved the Grand Canyon in about 6 million years.

In 100 years, how will a butte or the arches in Arches National Park change because of wind erosion?

- It will change very little

Which mountain range is older, the Rocky Mountains or the Appalachian Mountains. How do we know?

- The Appalachian Mountains
- We know they are older because they are about 15,000 feet shorter because of erosion.

What causes earthquakes?

- The movement of the Earth's tectonic plates.

How do the plates move?

- They converge- push together
- They diverge- pull apart
- They transform- slide past each other

What are fold mountains?

- Fold mountains are the most common type of mountain. The world's largest mountain ranges are fold mountains. These ranges were formed over millions of years.
- Fold mountains are formed when two plates collide head on, and their edges crumbled, much the same way as a piece of paper folds when pushed together.

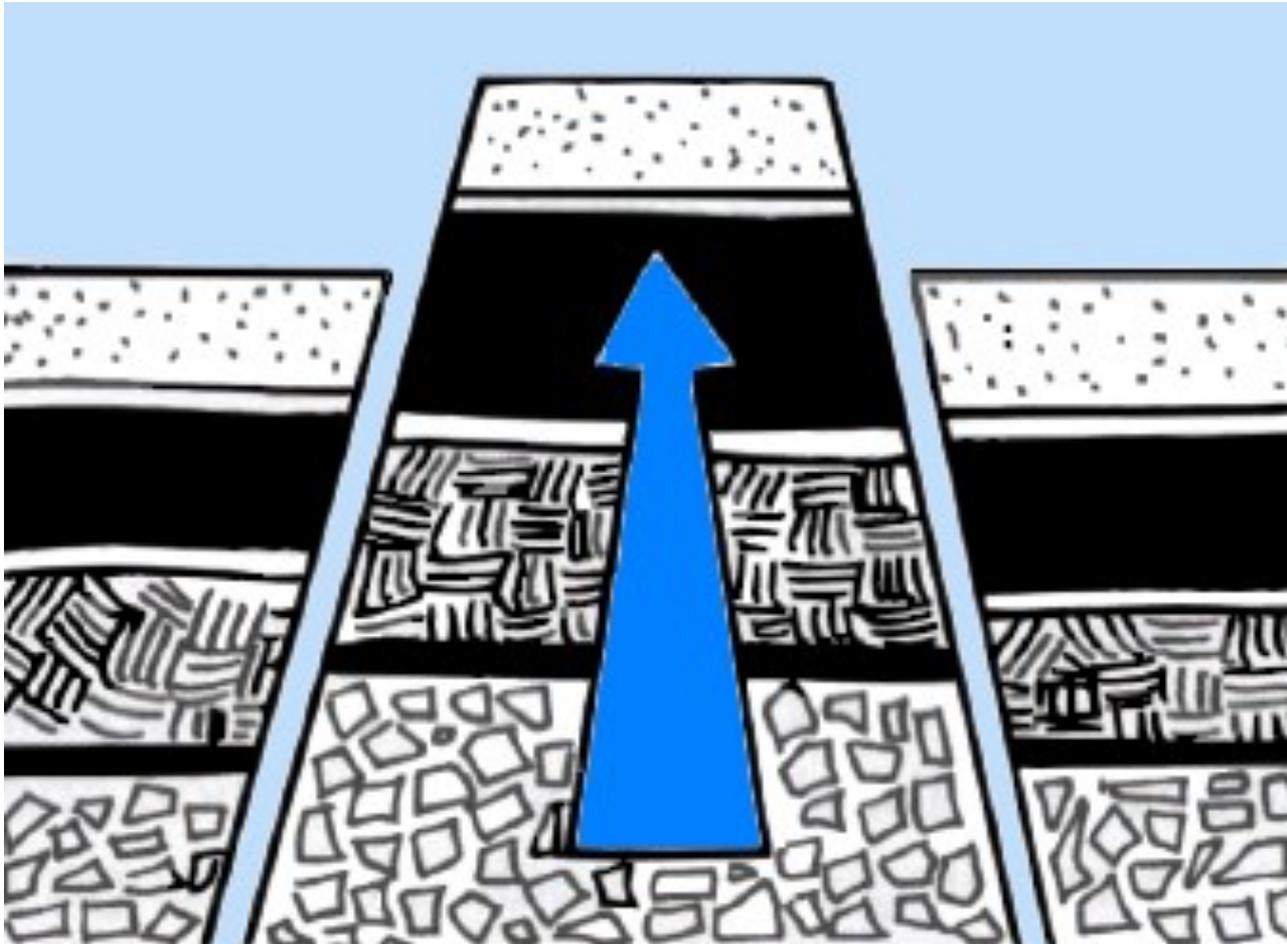
What do fold mountains look like?



What are fault-block mountains?

- These mountains form when faults or cracks in the earth's crust force some materials or blocks of rock up and others down.
- Instead of the earth folding over, the earth's crust fractures (pulls apart). It breaks up into blocks or chunks. Sometimes these blocks of rock move up and down, as they move apart and blocks of rock end up being stacked on one another.

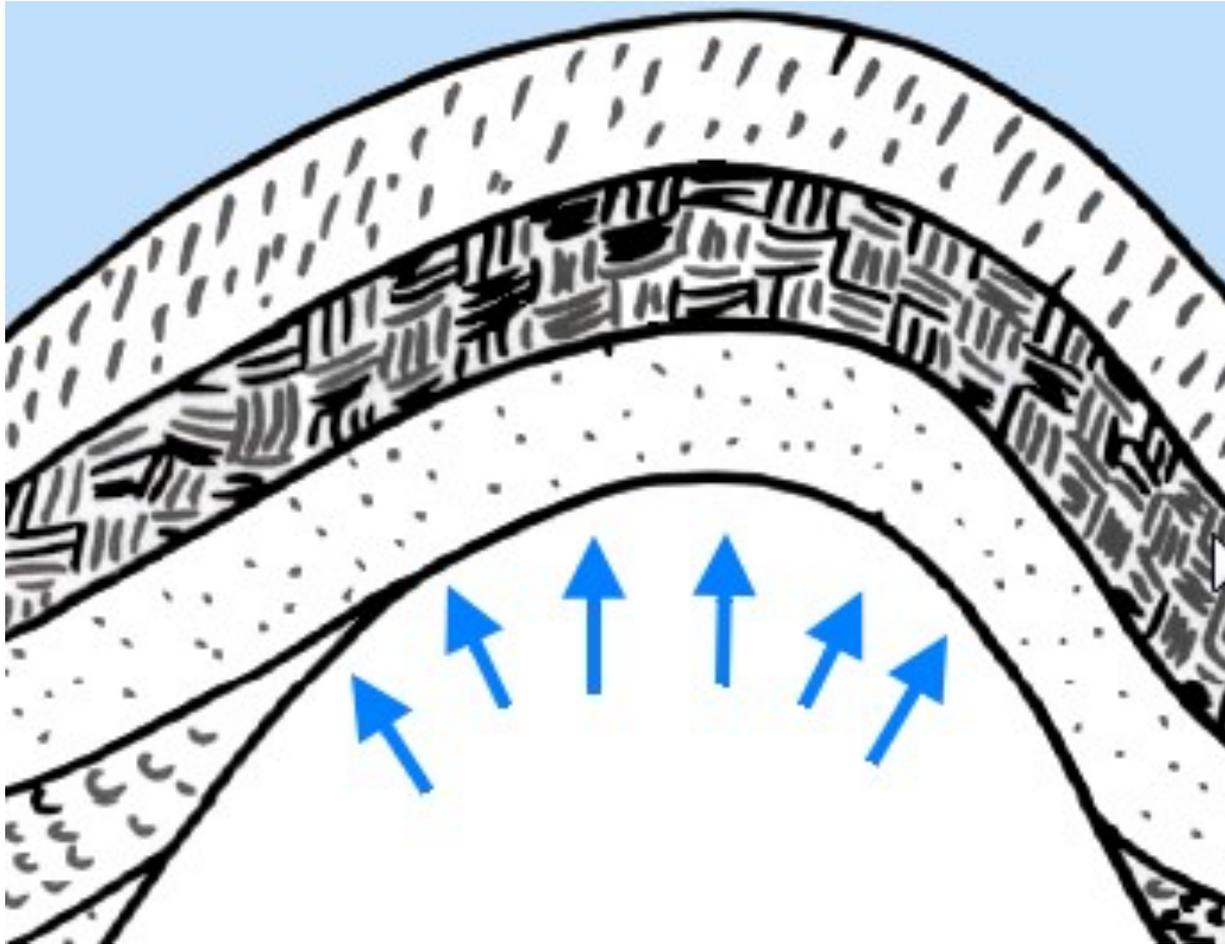
What do fault-block mountains look like?



What are dome mountains?

- Dome mountains are the result of melted rock (magma) pushing its way up under the earth crust. Without actually erupting onto the surface, the magma pushes up overlaying rock layers. At some point, the magma cools and forms hardened rock.
- The uplifted area created by rising magma is called a dome because of looking like the top half of a sphere (ball). The rock layers over the hardened magma are warped upward to form the dome. But the rock layers of the surrounding area remain flat.

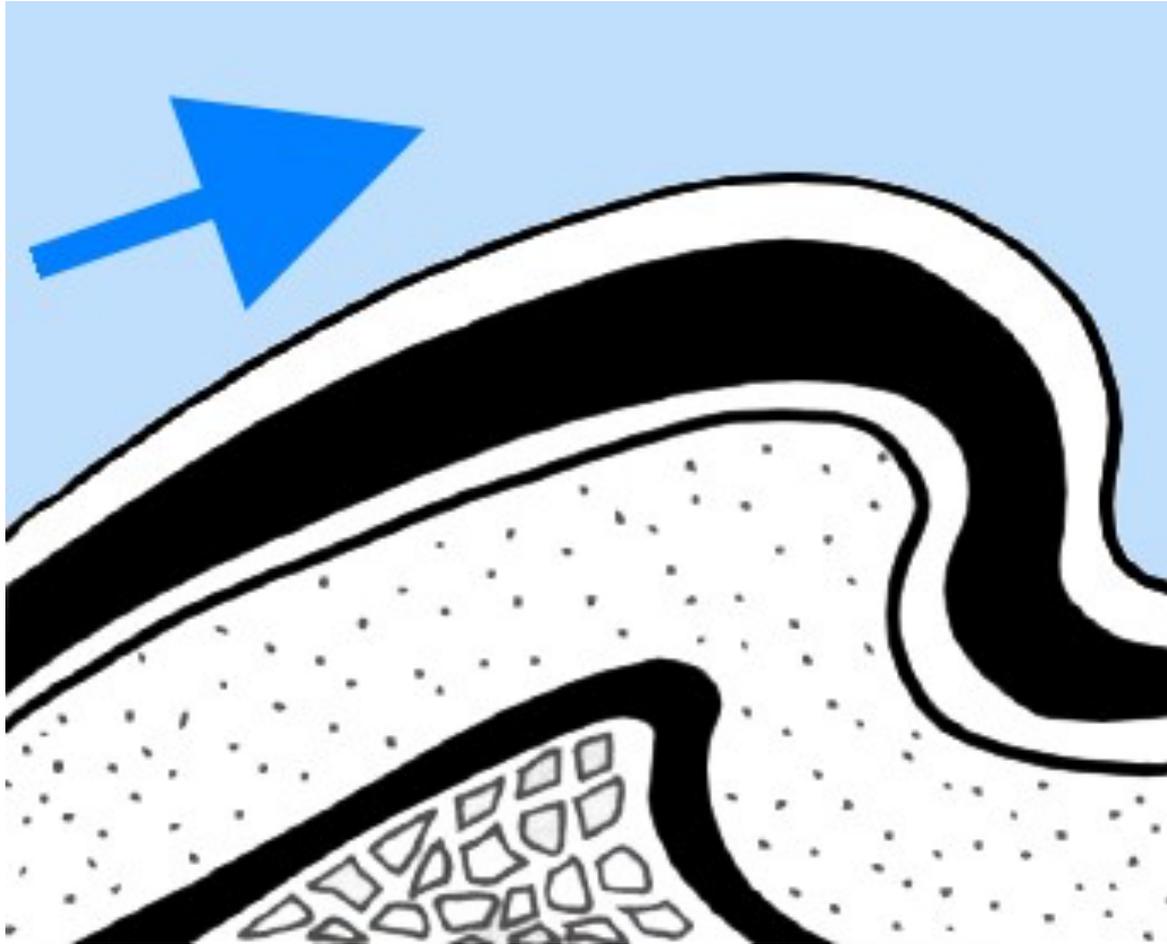
What does a dome mountain look like?



What are volcanic mountains?

- Volcanic Mountains are formed when molten rock (magma) deep within the earth, erupts, and piles upon the surface.
- Magma is called lava when it breaks through the earth's crust. When the ash and lava cools, it builds a cone of rock. Rock and lava pile up, layer on top of layer.

What do volcanic mountains look like?



What are plateau mountains?

- Plateau mountains are not formed by internal activity. Instead, these mountains are formed by erosion. Plateaus are large flat areas that have been pushed above sea level by forces within the Earth, or have been formed by layers of lava.
- Plateau mountains are often found near folded mountains. As years pass, streams and rivers erode valleys through the plateau, leaving mountains standing between the valleys.

What is a volcano?

- An opening in the Earth's crust where magma, rock and hot gases spew or spit out.

What is uplift?

- When forces of heat and pressure deep within the Earth cause part of the Earth's surface to rise up above the surrounding land.

How do volcanoes, earthquakes, and/or uplift affect Earth's surface?

- They create mountains and valleys
- They widen oceans
- They can create new islands
- They can destroy too

What is a seismograph?

- A device used to measure wave movement through the Earth's crust
- What can it help predict?
 - Earthquakes

Describe a location in Utah that was created by a volcano, earthquake, or uplift.

- Volcano: lava flows in Southern Utah and also near Delta. Topaz mountain, Henry Mountains.
- Earthquake: Most of the valleys and mountain ranges of Northern and Central Utah.
- Uplift: The Colorado Plateau in the southeast portion of the state nearly all the canyon country.

How is a V-Shaped Valley Formed?

- River flowing for thousands or millions of years

How is a U-Shaped Valley formed?

- Glacier erosion over thousands or millions of years

How is a plateau formed?

- Uplift from the heat and pressure of magma under the surface of the earth.

How is a butte formed?

- Water and wind erosion over thousands or millions of years.

How is an arch formed?

- Rainwater & wind

What is the process by which rocks are broken down into smaller pieces?

- Weathering

What is the process by which pieces of the Earth's surface are moved from one place to another?

- Erosion

What is the process by which pieces of the Earth's surface dropped into a new location?

- Deposition

Over time, what will weathering do to Delicate Arch?

- Break it apart and erode the arch away

What is the range of magnitudes
for most major earthquakes

- 8.0 - 9.0

What is a fault line?

- A crack in the earth's surface along plate boundaries
- Where plate movement takes place, causing earthquakes.

Where are earthquakes most likely to happen?

- Along fault lines

What does a young mountain look like compared to an old mountain.

- A young mountain has a higher elevation (taller) because it hasn't been eroded as long as the older mountain.

What are the types of volcanoes?

- Shield- low dome shape, erupt quietly with smooth flowing lava
- Cinder cone- cone shaped with steep sides,
- Composite volcanoes- cone shaped, steeper than shield, but not as steep as cinder cones,

What's the structure of the Earth? Describe each part.

- Inner Core
- Outer Core
- Mantle
- Crust

What substances are attracted to a magnet?

- Iron & steel

What are the characteristics of magnetic substances?

- They can push or pull objects because of their poles
- They have force fields around them

Ancient people discovered magnetic rocks called lodestone. How did they use them?

- As compasses

What happens when two north poles of magnets are placed together?

- They repel

Which poles attract to each other?

- North and South
- Opposites

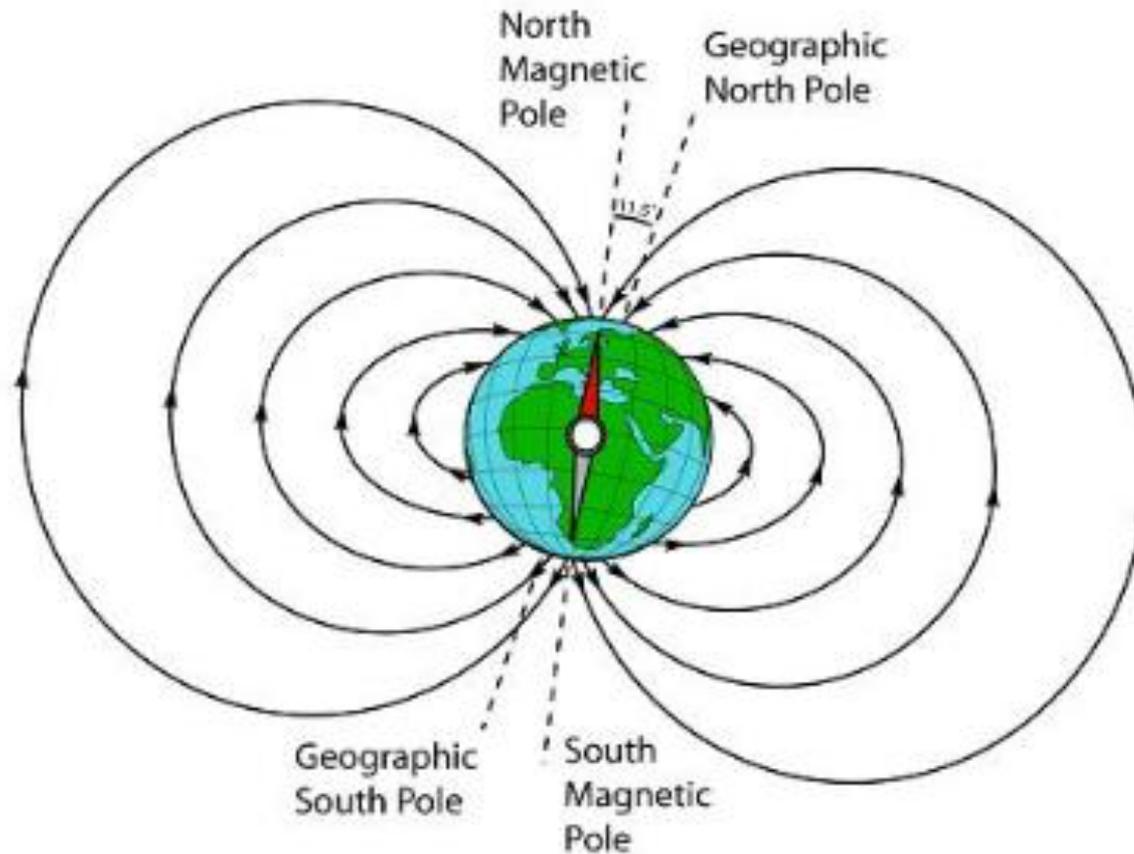
How is Earth's magnetic field similar to that of a magnet?

- It has a North and South pole

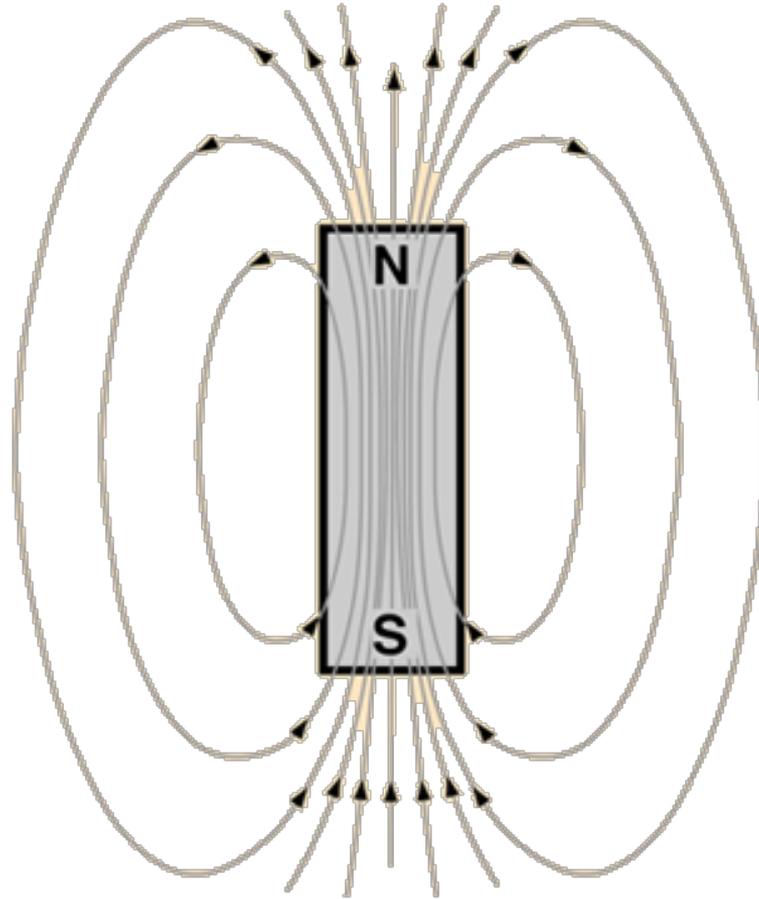
What is our best evidence that Earth has a magnetic field?

- A compass needle lines up with it

Draw the magnetic force field of the Earth

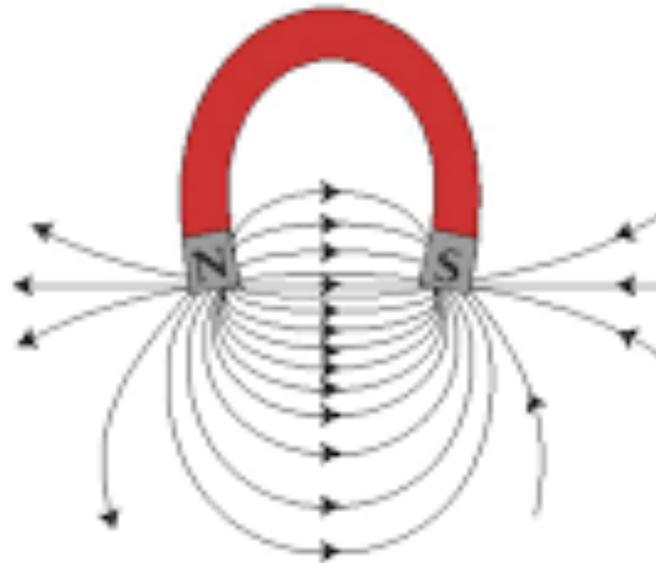


Draw the magnetic force field of a bar magnet



Draw the magnetic force field
of a horseshoe magnet

Field Lines in a Horseshoe Magnet



Two objects have collected static electricity with the same charge. What would the objects do when placed near each other?

- Repel

Which form of static electricity appears in nature?

- Lightning

Why is static electricity not widely used by people?

- It is stationary. It jumps in one place and doesn't flow continuously where it can be used.

Why does static electricity move from you to a metal object after you have walked over new carpet?

- It is attracted to the metal

How can you tell when static electricity has been discharge?

- Light is released and you can feel a shock.

When performing an experiment with electricity. What are some materials that would act as an insulator?

- Popsicle stick
- Rubberband
- Clay

Which type of electricity moves along a pathway to turn on a light?

- Current electricity

What would happen if you added more batteries to an electrical circuit containing light bulbs?

- The bulbs will be brighter

What are some materials that act as conductors of electricity?

- Paper clip
- Wire
- Water

If you wanted to make a light bulb glow. Which set of materials would you need?

- Battery (power source)
- Wire (conductor)
- Light bulb (load)

Which is better, a series or a parallel circuit? Why?

- A parallel circuit is better because it has more pathways

What can you use to open and close a circuit

- A switch

What is an open circuit?

- A circuit with a break or opening in the pathway that stops the flow of electricity

Which type of circuit
will make a load work?

- Closed circuit

How do you make an electromagnet?

- A wire is coiled around an iron core and connected to a source of electricity

What must happen for an electromagnet to have a magnetic field?

- It must be connected to an electrical source.

What is the most important difference between magnets and electromagnets?

- Electromagnets can be turned on and off

How are electromagnets used in our world?

- TV's
- Computers
- Telephones
- Doorbells
- Refrigerators
- MRI scanners
- Cranes

Why does a needle of a compass point north?

- The needle is magnetized

A picture of iron filings around a bar magnet shows what?

- The magnetic field is strongest at the poles

Why does a magnet mess up a compass so it points toward the magnet instead of Earth's North Pole?

- The magnet is closer than the Earth's magnet North

What is a hypothesis

- An educated guess or decision about what you think will happen in an experiment
- It is based on research
- You make a hypothesis before you do an experiment after you've researched your question

All science experiments begin with a question. Will any question lead to a good experiment?

- No, a scientific question must be testable and measurable to lead to an experiment

What's a variable

- Something you can change in an experiment
- You can only change one variable in an experiment or it is invalid

Science experiments must be what?

- Repeatable
- Done by different people with the same results