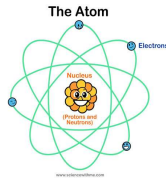


### Review: Matter

- **What are the states of matter?**
  - Solid, liquid, gas, plasma
- **What are the smallest units of matter that retain unique characteristics?**
  - Elements – atoms
- **What are elements made of?**
  - One type of atom only



### Review: Matter

- **What are compounds?**
  - Two or more elements combined to form a unique substance
- **Minerals are a type of compound. What makes them different from other compounds?**
  - Solid, natural, inorganic, crystalline

### Review: Matter

- **What is a rock?**
  - A solid mixture of two or more minerals or other substances (but mostly minerals)



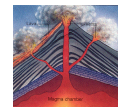
### Properties of Minerals

- **Identifying Minerals**
  - Geologists have identified over 3,000 minerals, each with unique properties
- **How can we identify these different minerals from each other? Properties!**
  - Color: color of mineral
  - Streak: color of mineral's powder
  - Luster: how light reflects off mineral
  - Density: mass over volume
  - Hardness: how hard is mineral
  - Crystal system: what shape are crystals
  - Cleavage/fracture: how mineral breaks
  - Special properties: fluorescent, magnetic, reacts with acid, etc



### How Minerals Form

- **Minerals can form from a hot solution of . . .**
  - Magma or lava!
  - Water!
- **What is a solution?**
  - a mixture with one substance dissolved into another
- **As solution (magma, lava, water) cools, minerals begin to form crystals. This is called . . .**
  - Crystallization



## How Minerals Form

- Minerals can also form from water solutions by evaporation. What?
  - water evaporates, leaves mineral crystals behind



## Uses of Minerals



- **Gemstones:**
  - Hard, colorful mineral with a brilliant or glassy luster
  - Mostly for jewelry, but also for mechanical parts and for grinding/polishing
  - Gem: a cut gemstone
- **Metals:**
  - Metals are ductile (can be stretched, hammered, spun into wire), also often conductive to electricity and heat
  - We make all sorts of tools and objects out of metals
- **And many other uses!**
  - Medicines, food, cosmetics, fertilizers, building materials . . . .

## Uses of Minerals

- **Why is mining important to society?**
  - Without mining, we could not make all of the things we use that contain minerals
- **Why is mining controversial, how can it be dangerous or damaging?**
  - Dangerous job for miners
  - Pollutes the environment, damages landscape
  - Mining of conflict minerals encourages human rights abuses

## Uses of Minerals

- **Ore**
  - Rock that contains a useful metal or other mineral
- **Prospecting**
  - Searching for ore deposits
- **Mining**
  - Removing ore from the ground
- **Smelting**
  - Separating useful minerals from the rock, usually by melting
- **Alloy**
  - A man-made solid mixture of two or more elements, at least one of which is a metal

