

Review: Matter

- What are the states of matter?

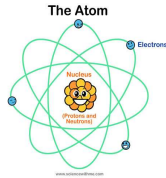
- Solid, liquid, gas, plasma

- 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
- Elements can also be called compounds

- **Minerals are a type of compound. What makes them different from other compounds?**

- Solid, natural, inorganic, crystalline, definite chemical composition

Review: Matter

- What is a **rock**?

- A solid mixture of two or more minerals or other compounds (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!**

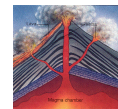
- Color: color of mineral
- Streak: color of mineral's powder
- Luster: how light reflects off mineral
- Density: mass over volume
- Hardness: how hard is mineral
- Crystal system: what shape are crystals
- Cleavage/fracture: how mineral breaks
- Special properties: fluorescent, magnetic, reacts with 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

