Humpty Dumpty → Physical: Cracked, Chemical: Fried

Starchy Goop: 250 mL cornstarch + 110 mL water → Viscosity Example!

Properties Of Matter (p. 458 – 465)

I. Physical Properties

1. Define the term physical property.

p. 458

Physical Property – any characteristic of a material that you can observe without changing the identity of the substances that make up the material

2. Match each physical property to the correct definition. (Not in the book.)

0.1 Viscosity: Not too thick → cold; Not too thin → hot

5W-30 – winter (thinner)

10W-30 – summer (thicker)

1. C - Viscosity		A. Ability of a solid to be hammered without shattering. (Gold vs. ice)
2. D - Conductivity		B. Temperature when substance changes from liquid to gas.
3. A - Malleability		C. The resistance of a liquid to flowing. (pop vs. molasses)
4. F - Melting Point		D. The ability to allow heat to flow. (and electricity) → copper
5. B - Boiling Point		E. The ratio of the mass of a substance to its volume. (Never changes when smaller or larger)
6. E - Density		F. Temperature when substance changes from solid to liquid.

3. How can each of the following physical properties help you identify substances?

Appearance: Shape, Color, State Of Matter, Measurements

Behavior: Magnetism, Malleability, Viscosity

Separation: Sifting, Magnetism (sand + iron filings) p. 459

II. Physical Change

1. Define the term physical change.

Physical Change – change in size, shape, or state of matter

Ex. - Paper Demo

2. Identify four state of matter changes that are considered physical changes. p. 460

1. Freezing
2. Evaporation
3. Boiling
4. Condensation

3. Define the term distillation.

Distillation – process for separating substances in a mixture by evaporating a liquid and recondensing its vapor

Filtration – ~~Larger~~ particles are trapped by a filter, while smaller particles pass through. Ex: Kidneys, Tea bags, Coffee

4. Explain why distillation works for converting seawater into fresh water.

1. Water has a lower boiling point than compounds in seawater
2. Water boiled + collected in separate container.
3. Dissolved compounds are left in original container.

p. 461

III. Chemical Properties & Change

p. 461

1. **Define the term chemical property.**

   Chemical Property – characteristic of a substance that indicates whether it can undergo a certain chemical change

Examples:
- Sticks
- Newspapers
- Gasoline

2. **Flammability is a material's ability to burn in the presence of oxygen.**

   Circle One : (True) False

3. **The property that describes how readily a substance combines chemically with other substances is called** reactivity **.** (Not in the book.)

Flame-Resistant
- Clothing
- X-mas Trees
- Insulation

4. **Nitrogen is a more reactive element than oxygen.** (Not in the book.)

   Circle One : True (False) → highly reactive

5. **Why isn't iron used to make coins?** (Not in the book.) Aluminum?

   Iron is highly reactive in the presence of oxygen + water.

6. **What is the benefit of pumping nitrogen gas into underwater steel tanks?** (Not in book.)

   Less rust forms in the tanks.

IV. Detecting Chemical Change

1. **Define the term chemical change.**

   Chemical Change – a change of one substance to another

2. **List three examples of chemical changes.**

   1. Decomposition (rotten eggs)
   2. Rust
   3. Antacid Bubbles

   - Baking a cake
   - Food Digestion
   - Leaves changing colors

3. **Circle the letters of examples of evidence for a chemical change.**

   a. a change in color → (Leaves, Copper Bracelet, Burnt Objects)
   b. a filter trapping particles
   c. the production of a gas (Vinegar + Baking Soda, Baking Bread → CO_2 released)
   d. the formation of a solid precipitate (from two liquids) p. 462 → (Cottage Cheese, Yogurt)

V. The Conservation Of Mass

p. 465

1. **Define the term law of conservation of mass.**

   Law Of Conservation Of Mass – mass of all substances that are present before a chemical change equals the mass of all the substances that remain after the change

2. **What are four things that wood changes into after a fire has occurred?**

   1. Ashes 2. Smoke 3. Heat 4. Light