


Grade 7 Science

Unit 3: Pure Substances and Mixtures



The Particle Theory of Matter

The particle theory of matter is:

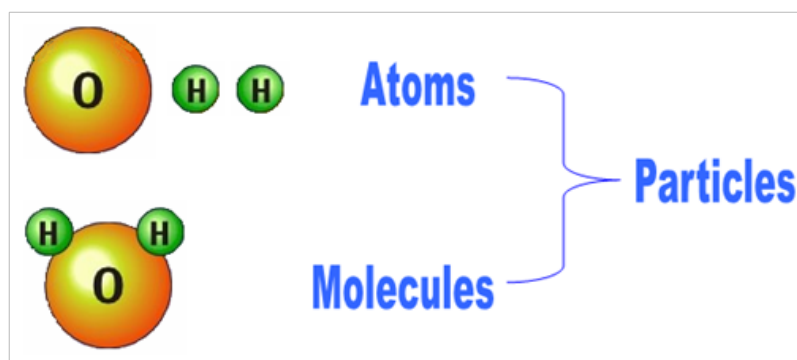
A scientific model of the structure of matter; according to the particle theory, all matter is made up of extremely tiny particles, and each pure substance has its own kind of particle, different from the particles from any other pure substance.

There are five main points to the particle theory:

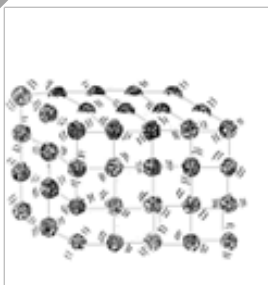
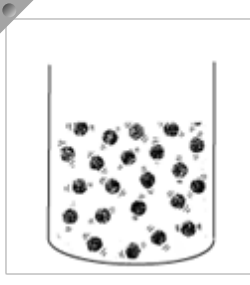
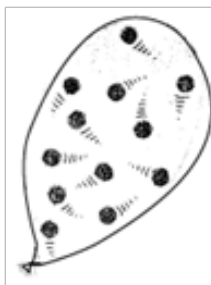
1. All matter is made up of particles
2. All particles in a pure substance are identical (no two different pure substances have the same particles)
3. All particles have space between them
4. All particles are always moving – more energy (heat) produces more movement
5. All particles are attracted to one another

The Particle Theory of Matter

There are two things we refer to as particles. These two things are atoms and molecules. Molecules are made from atoms. See the illustration below:



The different states of matter can be explained using the particle theory:

| Criteria | Solid | Liquid | Gas |
|------------|---|--|---|
| Spacing | Very Close | Far Apart | Very Far Apart |
| Movement | Slow Shakes, No Change of Location | Rapid Movements | Extremely Fast Movement |
| Attraction | Very High Ability to Attract | Low Ability to Attract | Very Low Ability to Attract |
| Picture |  |  |  |

*Do Demos

The Particle Theory of Matter

All of the information we have seen today will be posted as a note on the webpage. Today's homework is to go online and print that note. The note should then be stored in your binder. This information will be used for the rest of grade 7 science, for grade 8 science, and the rest of your scientific career.

Filtration

Next class we will be doing an experiment. We will use any remaining time to discuss this experiment, so that you are prepared when you arrive next class. Here is the worksheet:

| Name _____ | Date _____ | | | | | | | | | | | | |
|---|-----------------------------|----------|-----------------------------|-------------|----------------|----------|----------|-------------|---------|---------------|---------|----------------------|---------|
| FILTRATION | | | | | | | | | | | | | |
| Purpose: The purpose of this experiment is to separate a mixture of a solid and a liquid. | | | | | | | | | | | | | |
| Equipment: <table border="0"><tr><td>• Beaker</td><td>• 100 mL graduated cylinder</td></tr><tr><td>• Hot plate</td><td>• Filter paper</td></tr><tr><td>• Funnel</td><td>• Filter</td></tr><tr><td>• Stopwatch</td><td>• Paper</td></tr><tr><td>• Thermometer</td><td>• Paper</td></tr><tr><td>• Graduated cylinder</td><td>• Paper</td></tr></table> | | • Beaker | • 100 mL graduated cylinder | • Hot plate | • Filter paper | • Funnel | • Filter | • Stopwatch | • Paper | • Thermometer | • Paper | • Graduated cylinder | • Paper |
| • Beaker | • 100 mL graduated cylinder | | | | | | | | | | | | |
| • Hot plate | • Filter paper | | | | | | | | | | | | |
| • Funnel | • Filter | | | | | | | | | | | | |
| • Stopwatch | • Paper | | | | | | | | | | | | |
| • Thermometer | • Paper | | | | | | | | | | | | |
| • Graduated cylinder | • Paper | | | | | | | | | | | | |
| Procedure: 1. Prepare the mixture. a. Add 100 mL of water to a beaker. b. Add 10 g of sand to the water. c. Stir the mixture with a glass rod. 2. Prepare the filter. a. Fold the filter paper in half. b. Fold the filter paper in half again. c. Place the filter paper in the funnel. 3. Filter the mixture. a. Pour the mixture into the funnel. b. Collect the filtrate in a beaker. c. Measure the volume of the filtrate. | | | | | | | | | | | | | |

| Name _____ | Date _____ |
|---|------------|
| 1. Prepare the mixture. a. Add 100 mL of water to a beaker. b. Add 10 g of sand to the water. c. Stir the mixture with a glass rod. | |
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| 3. Filter the mixture. a. Pour the mixture into the funnel. b. Collect the filtrate in a beaker. c. Measure the volume of the filtrate. | |

Before next class please have a group of three organized and fill in your hypothesis.

Attachments

3-12 Filtering Worksheet.pdf