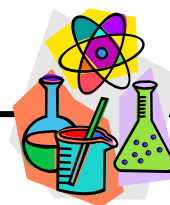
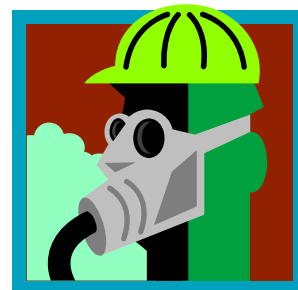


Science 10-4 Unit A: Investigating Properties of Matter



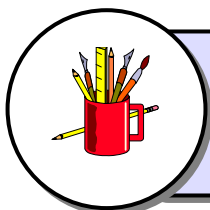
Matter Properties and Safety

1. Review information on the Workplace Hazardous Materials Information System (WHMIS) and Household Hazardous Products Symbols (HHPS) from the document [Safety in Science](#) and/or other sources. With a group, choose a hazardous substance and create a skit to demonstrate how to safely handle, store and dispose of it. Present your skit to the rest of the class.



2. With a partner or classmates, explore one or more of the following questions.


- Should students use cleaning supplies and chemicals in schools or the workplace if they fall under the WHMIS criteria for hazardous chemicals?
- Should cleaning supplies and other chemicals, e.g., pesticides, that fall under the WHMIS or HHPS criteria for hazardous chemicals be used in places where animals and small children spend time?
- How will learning more about WHMIS and HHPS benefit us at school, home and the workplace?



Use Tool [Preparing to Share an Opinion](#).

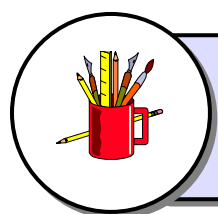
3. Conduct a chemical safety inventory of products in your classroom, science lab, school storage room, home/garage or workplace and identify how each of the following safety standards are met:
 - chemicals are clearly marked with HHPS labels
 - chemicals are stored in their original containers
 - instructions on each container regarding where and how the chemical should be stored have been followed
 - people who use the chemicals or share the space are aware of the safety precautions that must be taken.

If any WHMIS and/or HHPS standards are not met, work with others to create an action plan to improve the situation.



Use Tool [Action Plan Template](#).

4. Compare and contrast the following pure substances and mixtures using Venn diagrams:
 - zinc and brass
 - iron and stainless steel
 - acetic acid and vinegar
 - pure water and salt water.



Use Tool [Venn Diagram](#).

5. Investigate pure substances and mixtures used at home and in the workplace. Describe how the properties of the substance or mixture help it do the job it is used for. Use a chart like the one below.

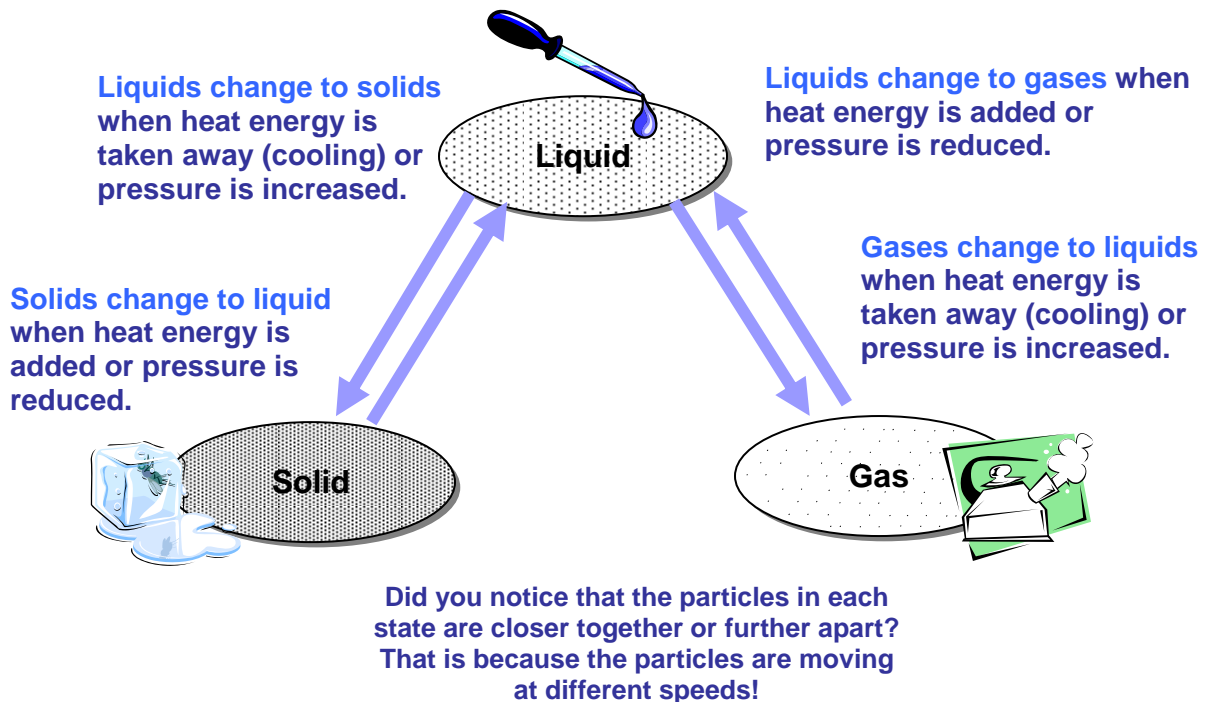
Pure Substance or Mixture	Properties	How it is used

6. With a group, discuss the differences between the physical and chemical properties of matter. Describe the physical and chemical properties of the following substances:

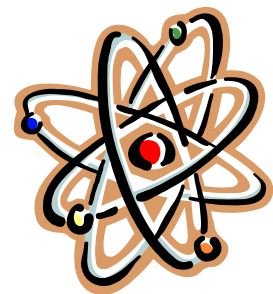
Substance	Physical Properties	Chemical Properties
iron	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
vinegar	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
motor oil	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
salt	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

States of Matter

The state of a substance—solid, liquid or gas. A substance's state depends on how fast its particles are moving and how far apart they are. State is affected by temperature and pressure.



7. Create a diagram that explains the physical properties of the phases of matter; e.g., solid, liquid, gas. Explain and show what happens to the particles of the matter during the different phases; e.g., electrons are excited and move around quickly.



8. With a group, discuss examples of each of the following and how these processes relate to the Particle Theory of Matter:
- melting
 - freezing
 - evaporating
 - condensing.
9. Create an experiment to show how a substance changes its state.



Use Tools [Planning an Experiment](#), [Experiment/Investigation Template II](#) and [Analyzing and Interpreting Experiment Results](#).