

**You Be The Chemist Grades - Curriculum Connections  
Alberta 5-8**

Lesson 1: Goofy Putty

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
  - 4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)

Lesson 2: Goldenrod Detector

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.9 Use an indicator to identify a solution as being acidic or basic.

Grade 6: none

Grade 7: none

Grade 8: none

Lesson 3: Rusting Wool

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.8 Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.

Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.8 Recognize that air is composed of different gases, and identify evidence for different gases. Example evidence might include: effects on flames, the “using up” of a particular gas by burning or rusting, animal needs for air exchange.

Grade 7: none

Grade 8: none

#### Lesson 4: Buoyant Butter

Grade 5: none

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 3<sup>rd</sup> point: compare densities of materials; and explain differences in the density of solids, liquids and gases, using the particle model of matter

#### Lesson 5: Rubber Eggs

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.
- 5-7.8 Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.

Grade 6: none

Grade 7: none

Grade 8: none

#### Lesson 6: The Moving Molecule Stomp

Grade 5: none

Grade 6: none

Grade 7: UNIT C: HEAT AND TEMPERATURE

- 2 Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models
  - 3<sup>rd</sup> point: explain the difference between solids, liquids, and gases in terms of density, using the particle theory of matter (e.g., in general, solids are more dense than liquids, which are more dense than gases)

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 3<sup>rd</sup> point: compare densities of materials; and explain differences in the density of solids, liquids and gases, using the particle model of matter
  - 6<sup>th</sup> point: investigate and compare the compressibility of liquids and gases

### Lesson 7: Lumpy Liquids

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.3 Distinguish substances that will dissolve in a liquid from those that will not, and demonstrate a way of recovering a material from solution.
- 5-7.8 Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 1. Investigate and describe fluids used in technological devices and everyday materials
  - 3<sup>rd</sup> point: describe examples in which materials are prepared as fluids in order to facilitate transport, processing or use (*e.g., converting mineral ores to liquids or slurries to facilitate transport, use of paint solvents to facilitate mixing and application of pigments, use of soapy water to carry away unwanted particles of material*)
- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)

### Lesson 8: Milk Rainbow

Grade 5: none

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)

### Lesson 9: Egg-Dye Solutions

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.9 Use an indicator to identify a solution as being acidic or basic.

Grade 6: none

Grade 7: none

Grade 8: none

### Lesson 10: Iron In Cereal

#### Grade 5: TOPIC A: ELECTRICITY AND MAGNETISM

- 5-5.3 Demonstrate and interpret evidence of magnetic fields around magnets and around current-carrying wires, by use of iron filings or by use of one or more compasses.

#### TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.

Grade 6: none

Grade 7: none

#### Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)

### Lesson 11: The Great Escape

#### Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.

#### Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.8 Provide evidence that air takes up space and exerts pressure, and identify examples of these properties in everyday applications

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#### Grade 7: UNIT C: HEAT AND TEMPERATURE

- 2 Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models
  - 3<sup>rd</sup> point: describe the effect of heat on the motion of particles; and explain changes of state, using the particle model of matter
  - 4<sup>th</sup> point: distinguish between heat and temperature; and explain temperature, using the concept of kinetic energy and the particle model of matter

#### Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
  - 3<sup>rd</sup> point: investigate and identify factors that affect solubility and the rate of dissolving a solute in a solvent (*e.g., identify the effect of temperature on solubility; identify the effect of particle size and agitation on rate of dissolving*)

-4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 1<sup>st</sup> point: investigate and compare fluids, based on their viscosity and flow rate, and describe the effects of temperature change on liquid flow

#### Lesson 12: Diaper Polymers

Grade 5: none  
Grade 6: none  
Grade 7: none  
Grade 8: none

#### Lesson 13: Disappearing Glass

Grade 5: none  
Grade 6: none  
Grade 7: none

#### Grade 8: UNIT C: LIGHT AND OPTICAL SYSTEMS

- 1. Investigate the nature of light and vision; and describe the role of invention, explanation and inquiry in developing our current knowledge
  - 3<sup>rd</sup> point: investigate light beams and optical devices, and identify phenomena that provide evidence of the nature of light (*e.g., evidence provided by viewing the passage of light through dusty air or cloudy water*)
- 2. Investigate the transmission of light, and describe its behaviour using a geometric ray model
  - 3<sup>rd</sup> point: investigate, measure and describe the refraction of light through different materials (*e.g., measure differences in light refraction through pure water, salt water and different oils*)

#### Lesson 14: Wacky Waxy Watercolours

Grade 5: none  
Grade 6: none  
Grade 7: none  
Grade 8: none

#### Lesson 15: Floating Paper Clips

#### Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.5 Recognize that the surface of water has distinctive properties, and describe the interaction of water with other liquids and solids.

Grade 6: none  
Grade 7: none  
Grade 8: none

### Lesson 16: Fountain Of Soda

#### Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.
- 5-7.8 Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.

Grade 6: none

Grade 7: none

#### Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
  - 2<sup>nd</sup> point: investigate the solubility of different materials, and describe their concentration (*e.g., describe concentration in grams of solute per 100 mL of solution*)
  - 3<sup>rd</sup> point: investigate and identify factors that affect solubility and the rate of dissolving a solute in a solvent (*e.g., identify the effect of temperature on solubility; identify the effect of particle size and agitation on rate of dissolving*)
  - 4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)
- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 17: Blubber In Sea Mammals

Grade 5: none

Grade 6: none

#### Grade 7: UNIT C: HEAT AND TEMPERATURE

- 3 Apply an understanding of heat and temperature in interpreting natural phenomena and technological devices
  - 3<sup>rd</sup> point: compare and evaluate materials and designs that maximize or minimize heat energy transfer (*e.g., design and build a device that minimizes energy transfer, such as an insulated container for hot drinks; evaluate different window coatings for use in a model home*)
  - 6<sup>th</sup> point: investigate and describe practical problems in controlling and using thermal energy (*e.g., heat losses, excess energy consumption, damage to materials caused by uneven heating, risk of fire*)

Grade 8: none

### Lesson 18: Puffed Rice Fleas

Grade 5: none  
 Grade 6: none  
 Grade 7: none  
 Grade 8: none

### Lesson 19: Hold The Salt

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.
- 5-7.3 Distinguish substances that will dissolve in a liquid from those that will not, and demonstrate a way of recovering a material from solution.
- 5-7.4 Demonstrate a procedure for making a crystal.
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.

Grade 6: none  
 Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
- 4. Identify, interpret and apply technologies based on properties of fluids
  - 1<sup>st</sup> point: describe technologies based on the solubility of materials (*e.g., mining salt or potash by dissolving*)

UNIT E: FRESHWATER AND SALTWATER SYSTEMS

- 1. Describe the distribution and characteristics of water in local and global environments, and identify the significance of water supply and quality to the needs of humans and other living things
  - 2<sup>nd</sup> point: recognize that fresh water and salt water contain varying amounts of dissolved materials, particulates and biological components; and interpret information on these component materials
  - 4<sup>th</sup> point: describe, in general terms, methods for generating fresh water from salt water, based on evaporation, distillation and reverse osmosis

### Lesson 20: Liquid Rainbow

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 1. Investigate and describe fluids used in technological devices and everyday materials
  - 4<sup>th</sup> point: identify properties of fluids that are important in their selection and use (*e.g., lubricant properties of oils, compressibility of gases used in tires*)
- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
  - 4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)
- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 2<sup>nd</sup> point: observe the mass and volume of a liquid, and calculate its density using the formula  $d = m/v$  [*Note: This outcome does not require students to perform formula manipulations or solve for unknown terms other than the density.*]

Lesson 21: Making Paper

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)

Lesson 22: Balloon Rockets

Grade 5: none

Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.1 Provide evidence that air takes up space and exerts pressure, and identify examples of these properties in everyday applications.
- 6-5.2 Provide evidence that air is a fluid and is capable of being compressed, and identify examples of these properties in everyday applications
- 6-5.7 Recognize that streamlining reduces drag, and predict the effects of specific design changes on the drag of a model aircraft or aircraft components

TOPIC B: FLIGHT

- 6-6.7 Describe differences in design between aircraft and spacecraft, and identify reasons for the design differences. **Note:** Model aircraft or rockets may be constructed and used as part of this topic. It is recommended that these models be simple devices of the student's construction, not prefabricated models. Propulsion of rockets by chemical fuels is neither required nor recommended, due to safety considerations.

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)
- 4. Identify, interpret and apply technologies based on properties of fluids
  - 5<sup>th</sup> point: construct a device that uses the transfer of fluids to apply a force or to control motion (*e.g., construct a model hydraulic lift; construct a submersible that can be made to sink or float by transfer of a fluid; construct a model of a pump*)

### Lesson 23: Paper Chromatography

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 1. Investigate and describe fluids used in technological devices and everyday materials
  - 4<sup>th</sup> point: identify properties of fluids that are important in their selection and use (*e.g., lubricant properties of oils, compressibility of gases used in tires*)
- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)
  - 4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)

### Lesson 24: Exploding Bags

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea

- 5-7.6 Produce carbon dioxide gas through the interaction of solids and liquids, and demonstrate that it is different from air.
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.
- 5-7.8 Recognize and describe evidence of a chemical reaction. Explain how the products of a reaction differ from the original substances.

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 25: Gasping For Air

Grade 5: none

Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.1 Provide evidence that air takes up space and exerts pressure, and identify examples of these properties in everyday applications.

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 26: Capillary Carnations

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.5 Recognize that the surface of water has distinctive properties, and describe the interaction of water with other liquids and solids.

Grade 6: none

Grade 7: none

Grade 8: UNIT B: CELLS AND SYSTEMS

- Investigate and describe the role of cells within living things
  - 4<sup>th</sup> point: describe the movement of gases and liquids into and out of cells during diffusion and osmosis, based on concentration differences [*Note: This outcome requires a general understanding of processes, not a detailed analysis of mechanisms.*]

Lesson 27: Melting Ice With Salt

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.

Grade 6: none

Grade 7: UNIT C: HEAT AND TEMPERATURE

- 1 Illustrate and explain how human needs have led to technologies for obtaining and controlling thermal energy and to increased use of energy resources
  - 2<sup>nd</sup> point: trace linkages between human purposes and the development of heat-related materials and technologies (*e.g., development of hair dryers and clothes dryers; development of protective clothing, such as oven mitts, ski suits and survival clothing*)
  - 3<sup>rd</sup> point: identify and explain uses of devices and systems to generate, transfer, control or remove thermal energy (*e.g., describe how a furnace and wall thermostat keep a house at a constant temperature*)
- 2 Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models
  - 3<sup>rd</sup> point: describe the effect of heat on the motion of particles; and explain changes of state, using the particle model of matter
- 3 Apply an understanding of heat and temperature in interpreting natural phenomena and technological devices
  - 6<sup>th</sup> point: investigate and describe practical problems in controlling and using thermal energy (*e.g., heat losses, excess energy consumption, damage to materials caused by uneven heating, risk of fire*)

Grade 8: none

Lesson 28: Separating Salt & Pepper

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (*e.g., identify examples found in households*)

### Lesson 29: Antigravity Water

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.5 Recognize that the surface of water has distinctive properties, and describe the interaction of water with other liquids and solids.

Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.1 Provide evidence that air takes up space and exerts pressure, and identify examples of these properties in everyday applications.

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 30: Solid Or Liquid?

Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea

Grade 6: none

Grade 7: none

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 4<sup>th</sup> point: relate the properties of mixtures and solutions to the particle model of matter (*e.g., recognize that the attraction between particles of solute and particles of solvent helps keep materials in solution*)
- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 1<sup>st</sup> point: investigate and compare fluids, based on their viscosity and flow rate, and describe the effects of temperature change on liquid flow
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 31: Balloon In A Bottle

Grade 5: none

Grade 6: TOPIC A: AIR AND AERODYNAMICS

- 6-5.1 Provide evidence that air takes up space and exerts pressure, and identify examples of these properties in everyday applications.
- 6-5.2 Provide evidence that air is a fluid and is capable of being compressed, and identify examples of these properties in everyday applications.
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Grade 7: UNIT C: HEAT AND TEMPERATURE

- 2. Describe the nature of thermal energy and its effects on different forms of matter, using informal observations, experimental evidence and models
  - 3<sup>rd</sup> point: describe the effect of heat on the motion of particles; and explain changes of state, using the particle model of matter
  - 5<sup>th</sup> point: investigate and describe the effects of heating and cooling on the volume of different materials, and identify applications of these effects (*e.g., use of expansion joints on bridges and railway tracks to accommodate thermal expansion*)

Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 1. Investigate and describe fluids used in technological devices and everyday materials
  - 4<sup>th</sup> point: identify properties of fluids that are important in their selection and use (*e.g., lubricant properties of oils, compressibility of gases used in tires*)
- 3. Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter
  - 1<sup>st</sup> point: investigate and compare fluids, based on their viscosity and flow rate, and describe the effects of temperature change on liquid flow
  - 5<sup>th</sup> point: describe pressure as a force per unit area by using the formula  $p = F/A$ , and describe applications of pressure in fluids and everyday situations (*e.g., describe pressure exerted by water in hoses, air in tires, carbon dioxide in fire extinguishers; explain the effects of flat heels and stiletto heels, using the concept of pressure*)

### Lesson 32: Rubber-Band Racers

Grade 5: none

Grade 6: none

Grade 7: none

Grade 8: UNIT D: MECHANICAL SYSTEMS

- 2. Analyze machines by describing the structures and functions of the overall system, the subsystems and the component parts
  - 1<sup>st</sup> point: analyze a mechanical device, by:
    - describing the overall function of the device
    - describing the contribution of individual components or subsystems to the overall function of the device
    - identifying components that operate as simple machines
  - 2<sup>nd</sup> point: identify the source of energy for some familiar mechanical devices
  - 3<sup>rd</sup> point: identify linkages and power transmissions in a mechanical device, and describe their general

function (e.g., identify the purpose and general function of belt drives and gear systems within a mechanical device)

- 3. Investigate and describe the transmission of force and energy between parts of a mechanical system
  - 2<sup>nd</sup> point: build or modify a model mechanical system to provide for different turning ratios between a driving and driven shaft, or to achieve a given force ratio

### Lesson 33: T-shirt Tye-Dye

#### Grade 5: TOPIC C: CLASSROOM CHEMISTRY

- 5-7.1 Recognize and identify examples of the following kinds of mixtures:
  - two or more solids; e.g., sand and sugar
  - a solid and a liquid; e.g., sugar and water
  - two or more liquids; e.g., milk and tea
- 5-7.2 Apply and evaluate a variety of techniques for separating different materials.
- 5-7.7 Distinguish reversible from irreversible changes of materials, and give examples of each.

Grade 6: none

Grade 7: none

#### Grade 8: UNIT A: MIX AND FLOW OF MATTER

- 2. Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution
  - 1<sup>st</sup> point: distinguish among pure substances, mixtures and solutions, using common examples (e.g., identify examples found in households)