

DURATION:

45 minutes

GRADE:

1–3

30 students maximum

KEYWORDS:

Chemical change

Physical change

Molecule

Atom

Matter

Mixture

Solution

CURRICULUM**LINKS BY GRADE:**

Grade 1 (Properties of Matter)

Grade 2 (Physical and
Chemical Change)

Grade 3 (Matter, Thermal Energy)

CURRICULAR**COMPETENCIES:**

Questioning and Predicting

Planning and Conducting

Processing and Analyzing

Communicating

Evaluating

THIS WORKSHOP DEVELOPS STUDENTS' IDEAS AROUND WHAT MATTER IS AND HOW MATTER CAN CHANGE. THROUGH HANDS-ON EXPERIMENTS, STUDENTS WILL LEARN TO DIFFERENTIATE BETWEEN CHEMICAL AND PHYSICAL CHANGE.

WHAT WILL HAPPEN IN THE EXPLORING MATTER WORKSHOP?

Working in small groups with their adult chaperones, students will combine familiar household materials to create some surprising results that bubble, fizz, dissolve and mix (or don't mix). They'll see carbon dioxide turn directly from solid to gas and experience reactions that get hot and cold.

CLASSROOM ACTIVITY: THE SWIRLS AROUND US

The change of state from a solid to liquid is called **melting**. To melt a solid, we need to give it heat energy, so the molecules can move more freely around each other. In this activity, ice is surrounded by liquids at different temperatures. The hotter the liquid, the faster the ice absorbs heat energy. When the temperature of the ice reaches 0°C, it begins to melt.

MATERIALS

- » Clear, heat-safe cups for liquids
- » Hot water, cold water and other types of liquids (salt water, oil) for the extension activities
- » Coloured ice cubes made from water dyed with food colouring (at least 1 tray of ice cubes is recommended)

WHAT TO DO**Preparation:**

1. Make ice cubes from water dyed with food colouring.

Demonstration:

1. Set-up cups containing water at different temperatures. Hot water may be stored in a Thermos® and then poured into a cup prior to adding an ice cube.
2. Have the coloured ice cubes ready to be dropped into each cup.
3. Ask student volunteers to drop an ice cube into each cup. Have them place an ice cube slowly into the hot water, to avoid getting splashed by hot liquid.
4. Ask students to observe the swirling liquids. As the ice cube melts, what happens to the liquid?

KEY QUESTIONS:

- » What is the name of the transition from solid to liquid?
- » Which liquid does the ice cube melt the fastest in?
- » How do we tell that the ice melts faster in one cup than the other?

Activity continued on other side



EXTENSIONS:

Try different liquids other than fresh water, like oil or salt water. Make observations as to what happens with these different liquids when the ice cube melts. For instance, when an ice cube is placed in salt water, the ice cube melts and creates a freshwater layer. Fresh water is less dense than salt water and therefore will float on top. As the layer of fresh water increases, the temperature of the water decreases causing the ice to melt more slowly. In the case of a freshwater medium containing a freshwater ice cube, the densities are the same, so there is a continuous flow of heat, because of the convection currents that are created from the warm stream of liquid.

MORE ABOUT CHEMISTRY AT TELUS WORLD OF SCIENCE

Peter Brown Family Centre Stage Shows:

Cold
Fire
Chemistry
Bubbles

Check scienceworld.ca/centrestage for availability.

RECOMMENDED RESOURCES:

- » Science World Resources | Units | States of Matter
scienceworld.ca/resources/units/states-matter
- » Science World Resources | Units | Wonderful Water
scienceworld.ca/resources/units/wonderful-water
- » Science World Resources | Units | Bubbles
scienceworld.ca/resources/units/bubbles
- » *Teaching Chemistry with Toys* by Jerry L. Sarquis, Mickey Sarquis, and John P. Williams (Terrific Science Press 1995). ISBN 0-07-064722-4
- » American Chemical Society | Inquiry in Action | Resources for inquiry chemistry
inquiryinaction.org