

Grade Two Science

Aligned to Alberta Curriculum

Written by Tracy Bellaire and Andrew Gilchrist

This teacher resource has been designed to give students an understanding and appreciation of the 5 topics in Grade 2 Science Alberta Curriculum. Those 5 topics are Exploring Liquids, Buoyancy and Boats, Magnetism, Hot and Cold Temperatures and Small Crawling and Flying Animals. The lessons are designed to involve tactile participation and knowledge application while providing opportunities to connect ideas between topics and school subjects.



TRACY BELLAIRE is an experienced teacher who continues to be involved in various levels of education in her role as Differentiated Learning Resource Teacher in an elementary school in Ontario. She enjoys creating educational materials for all types of learners, and providing tools for teachers to further develop their skill set in the classroom. She hopes that these lessons help all to discover their love of science!



ANDREW GILCHRIST taught primary and junior classes for the Hastings Prince Edward District School Board in Ontario. He earned his teaching degree with a Teaching Subject qualification in History. He recently co-authored a series of mathematics programs that focus on fluency skills with basic math operations and fractions. The series, used for children with special education needs, was used for a study with University of Ottawa. Students using the program demonstrated achievements in fluency at twice the rate of regular in-class instruction, allowing them to catch up with peers.

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Some material appearing in this book has been used in other published works, such as Earth and Space Science Grade 2 (OTM2153), Physical Science Grade 2 (OTM2145) and Magnets (OTM2128).

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AT A GLANCE

Skills: Science Inquiry

2.1 Investigate, with guidance, the nature of things, demonstrating an understanding of the procedures followed. Students will identify one or more possible answers, predictions or hypotheses to questions asked by themselves and others.

2.2 Recognize pattern and order in objects and events studied; and, with guidance, record procedures and observations, using pictures and words; and make predictions and generalizations, based on observations. Students will use materials and make observations relevant to the questions asked, carry out simple procedures and identify materials used.

2.3 Construct, with guidance, an object that achieves a given purpose, using materials that are provided. Construction tasks will involve building stable objects that float on water. Students will identify the purpose of the object to be constructed through questions like “What structure do we need to make?” or “What does it accomplish?”

Attitudes

2.4 Demonstrate positive attitudes to the study of science and to the application of science. Students will show growth in acquiring and applying curiosity, inventiveness, perseverance, appreciation of the value of experience and observation, a willingness to work with others, a sense of responsibility for actions taken and respect for living things and environments with a commitment for their care.

Topic A: Exploring Liquids

2.5 Describe some properties of water and other liquids, and recognize the importance of water to living and nonliving things. Students will recognize and describe the characteristics of liquids in terms of the flow of a liquid, the shape of drops and the surface of calm water. Students will recognize that water is a component of many materials and living things and understand human responsibilities for maintaining clean supplies of water while identifying actions taken to ensure safe water supplies.

2.6 Describe the interaction of water with different materials, and apply that knowledge to practical problems of drying, liquid absorption and liquid containment. Students will compare water with other liquids based on colour, ease of flow, tendency of drops to form a ball or bead shape and how the liquids interact with other liquids and solid materials. Students will compare the amount of liquid absorbed by different materials such as paper, sponge, fabric and plastic and evaluate the suitability of different materials for containing liquids by observing what materials can hold water. Students will demonstrate that liquid water can be changed to other states through heating and cooling, predict that a wet surface will dry more quickly when exposed to wind or heating and apply this understanding to practical situations such as drying fabrics or materials and predict the water level in open containers will decrease due to evaporation but the level in close containers will stay the same.

Topic B: Buoyancy and Boats

2.7 Construct objects that will float on and move through water, and evaluate various designs of watercraft. Students will describe, classify and order materials on the basis of buoyancy in order to distinguish between materials that sink in water and those that float; alter or add to a floating object so that it will sink as well as add or alter a non-floating object to make it float; assemble materials with the purpose of having them float, carry a load and be stable in water. Students will develop and adapt methods of construction appropriate to the design task; change the design of a watercraft so it can be propelled through water; evaluate and explain the appropriateness of various materials to the construction of watercraft through considering the degree to which a material is waterproof or can make waterproof joints with other parts, the stiffness or rigidity of the material and the buoyancy of the material.

Topic C: Magnetism

2.8 Describe the interaction of magnets with other magnets and with common materials. Students will identify where magnets are used in the environment and why they are used; distinguish materials that are attracted by a magnet from those that are not, predict what metallic and non-metallic items will be attracted by a magnet while recognizing that magnets attract materials with iron and steel parts; recognize magnets have polarity and demonstrate that poles repel or attract each other, state a rule for when poles will repel or attract each other, design and produce a device that uses a magnet; demonstrate that some materials will interact with a magnet while other materials will be transparent to effects of a magnet.

Topic D: Hot and Cold Temperature

2.9 Recognize the effects of heating and cooling and identify methods for heating and cooling. Students will describe temperature in relative terms using expressions such as “hotter than” and “colder than”, measure temperature in degrees Celsius (C), describe how heating and cooling materials can change them, identify safe practises for handling hot and cold materials in order to avoid potential dangers, recognize the human body is relatively constant while a change in temperature often signals a change in health. Students will identify ways in which the temperature in homes and buildings can be adjusted, describing how local buildings are heated by identifying energy sources, air or water circulation systems, school building heating and cooling systems. Students will describe the role of insulation in keeping things hot or cold, identify places where some form of insulation is used, identify materials that insulate animals from the cold, design and construct a device to keep something hot or cold and describe ways in which temperature changes affect us in our daily lives.

Topic E: Small Crawling and Flying Animals

1.10 Describe the general structure and life habits of small crawling and flying animals and apply this knowledge to interpret local species that have been observed. Students will recognize that there are many kinds of small crawling and flying animals, identify a range of examples found locally, compare and contrast small local animals, including invertebrates, recognize that small animals have homes where they meet their basic needs of air, food, water, shelter and space and describe any special characteristics that help the animals survive. Students will identify each animal’s role in the food chain and identify ways in which animals are considered helpful or harmful to humans and the environment, identifying animals as plant eaters, animal eaters or decomposers. Students will describe the relationship of these animals to other living and non-living things in their habitat, give examples of ways that small animals avoid predators including the use of cover, camouflage, flight and keen senses and recognize how some plants and animals must adapt to extreme conditions to meet basic needs. Students will describe conditions for the care of small animals and demonstrate responsible care in maintaining a small animal for a number of days.

Taken from the Alberta Education Grade 2 Science Curriculum.

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TOPIC A: EXPLORING LIQUIDS

CHARACTERISTICS OF LIQUIDS

LEARNING INTENTIONS:

Students will learn about the properties of liquids.

SUCCESS CRITERIA:

- identify different liquids by their characteristics
- record observations in a chart and use the information to identify and describe liquids
- make conclusions about common properties or characteristics of liquids

MATERIALS NEEDED:

- plastic cups labelled A, B, C, D, E
- a variety of liquids (such as water, milk, vinegar, juice (orange and grape), syrup, ketchup, honey, glue, liquid soap, olive oil, peanut butter and molasses)
- a cookie tray, a plastic tray or bag, newspaper, white paper, paper towel
- a very low ramp to test liquid flow
- a popsicle stick or stir stick or spoon
- a fan, a heater and a hair dryer
- cleaning and safety materials if needed
- copy of *Properties of Liquids* Worksheet for each student or group
- copy of *Describing Liquids* Worksheet for each student or group
- copy of *Comparing Liquids* Worksheet for each student or group
- copy of *Observing Liquids* Worksheet for each student or group
- copy of *When Things Get Wet* Worksheet for each student or group
- pencils, pencil crayons, clipboards for students as needed
- cleaning products as needed

PROCEDURE:

*The following worksheets may be used as one long lesson, as separate shorter lessons or as science lab learning stations.

1. Discuss with students the meaning of liquids. Lead students in a brainstorming activity or discussion about the different liquids they know. Give students the Properties of Liquids Worksheet to complete. Come back together as a large group to take up answers.
2. Give students the Describing Liquids Worksheet. Tell students you will demonstrate each liquid, but they must make observations. Pour liquids one at a time (olive oil, peanut butter, glue, syrup, honey, grape juice, ketchup, milk, juice, water) one at a time into a bowl (you may want to use a separate or disposable bowl for the glue). Each time, call upon one or two students to touch each liquid and describe how it feels to the rest of the group. Students will complete the worksheet as each liquid is being explored.
3. Ask students what happens when a liquid touches some other object or material. Lead a discussion on how some things will absorb liquids while others will not. Give students the Comparing Liquids Worksheet (front and back) and read through the introduction, materials needed and What To Do sections. As a large group or in small student groups, conduct the experiment. Students will make predictions, record their predictions and observe that will happen when liquid is poured on the different materials. Conduct the experiment by slowly pouring a spot of water and a spot of oil on the paper towel, white paper, newspaper and cookie tray. Students will fill in the lines and the chart on the back of the worksheet.
4. Lead students in a discussion about how we know what liquid is what we think it is. Some liquids, for example, have a smell, a texture or feel, or a certain colour. Explain to students how it could be important to test and observe liquids before us-

ing them (for example, vinegar and water look the same. How can we tell them apart?) Give students the Observing Liquid Worksheet. Read through each section with the students. Students will work through the steps and observe each liquid in the cups in order to fill in the chart and the blanks on the worksheet.

5. Ask the students if they have ever been outside in the rain. What happens to their clothes? (Or role-play an example, where a shirt absorbs a small amount of rain or a drink). Discuss with the students the ways things can get dry (for example, what does wind do, or heat do, to wet things?). Give students the When Things Get Wet Worksheet and read through the introductory question, the What I Need, the What I Do Section and the questions on the worksheet. Demonstrate the procedure as needed by drying a sample piece of fabric with the fan, the heater and the hair dryer.

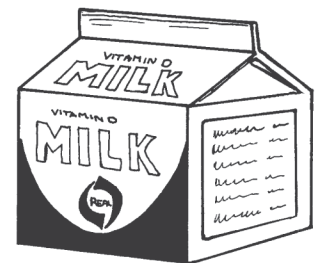
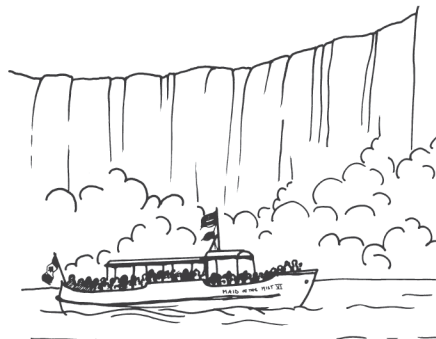
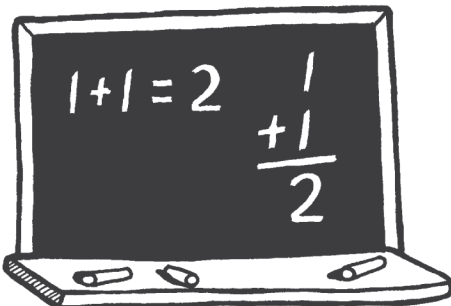
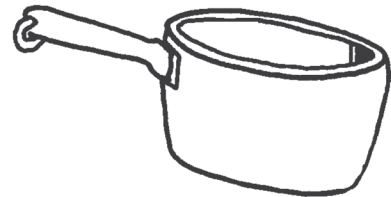
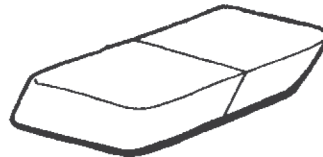
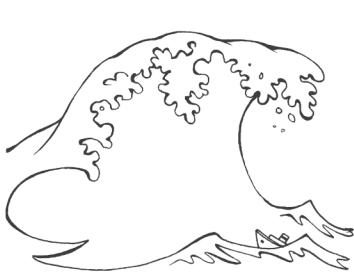
DIFFERENTIATION

Slower learners may benefit from working with a peer to identify and compare liquids the worksheets. Other accommodations may include circling identified liquids rather than colouring them or working through the worksheets verbally instead of in written form.

For enrichment, faster learners could look through magazines and cut out pictures of liquids and glue them on paper to make a collage. Students would also practise the spelling of names of liquids and explore common uses for each liquid.

Properties of Liquids

Liquids are materials that change shape. They take the shape of their container. We can pour liquids. Water and juice are some examples of liquids. Colour the liquids below.



Describing Liquids

There are a lot of words used to describe the properties of liquids. Draw a line from each word to at least one liquid it describes. Each word can describe more than one liquid.



olive oil



peanut butter



glue



maple syrup



honey

sticky

thick

thin

slick

clear

slippery

oozing

runny



water



grape juice



ketchup



milk



orange juice

Comparing Liquids

We know that liquids have different properties. Some liquids pour faster than others, and some are thicker than others. Let's take a closer look at how well liquids can be absorbed by different materials.

You'll need:

- water
- oil
- paper towel
- white paper
- newspaper
- cookie tray

What to do:

1. Make predictions about what will happen when a liquid is poured on a paper towel, white paper, newspaper, and a cookie tray. Record them on Worksheet 6.
2. Slowly pour a small amount of each liquid onto the paper towel, white paper, newspaper, and the cookie tray.
3. What happened to the water? What happened to the oil? Record your observations.
4. Make conclusions about what you have observed.

Let's Predict

What do you think will happen when you pour a liquid on:

...the paper towel? _____

...the white paper? _____

...the newspaper? _____

...the cookie tray? _____

Let's Observe

	What happened to the water?	What happened to the oil?
paper towel		
white paper		
news-paper		
cookie tray		

Let's Conclude

What is the same for water and oil?

What is different between water and oil?

What was the best material to hold in the liquids?
