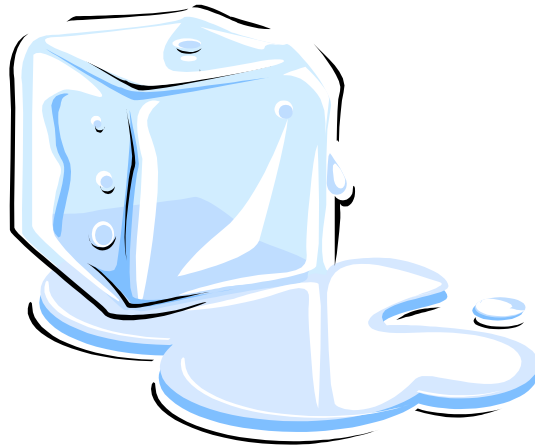


Liquids and Solids



Name: _____

Ontario Science and Technology Curriculum 1999

Strand: Matter and Materials

Topic: Properties of Liquids and Solids

Grade: 2

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Developed by T. Tasker

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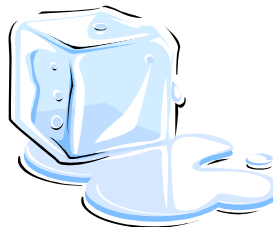
Overall Expectations:

- demonstrate an understanding of the properties of familiar liquids (eg. vinegar, detergent, water, oil) and solids (eg. sugar, salt, sand), and of interactions between liquids and between liquids and solids
- investigate the properties of and interactions between liquids and between liquids and solids and identify the types of objects or materials that can be used to contain liquids and solids (eg. a plastic bowl will hold a liquid or a solid but a paper towel will only hold a dry solid)
- identify and describe ways in which we use our knowledge of liquids and solids in making useful objects and in living in our environment

* All specific expectations are covered by this unit and are mentioned at the end of each activity with the exception of the following which are covered by all activities.

MM10: plan investigations to answer some of these questions or solve some of these problems, and describe the steps involved

Materials box			
milk water juice chocolate syrup bubbles dish soap molasses vegetable oil vinegar chocolate bar candles flour baking soda	sugar salt sand powered milk jell-o crystals rocks matches jars (8) kettle masking tape marker food colouring popsicle sticks	ice cubes powdered soap long neck bottle funnel bowls (2) spoon paper tin turkey pan bond paper paper towels cotton polar fleece wood	plastic wrap kitty litter box styrofoam cup paper plate plastic cup paper clip classroom toys cork



Dear Parent or Guardian,

We are beginning our next Science and Technology Unit, Matter and Materials, Properties of Liquids and Solids. By the end of this unit, your child will:

- demonstrate an understanding of the properties of familiar liquids (eg. vinegar, detergent, water, oil) and solids (eg. sugar, salt, sand), and of interactions between liquids and between liquids and solids
- investigate the properties of and interactions between liquids and between liquids and solids and identify the types of objects or materials that can be used to contain liquids and solids (eg. a plastic bowl will hold a liquid or a solid but a paper towel will only hold a dry solid)
- identify and describe ways in which we use our knowledge of liquids and solids in making useful objects and in living in our environment

As outlined in the Science and Technology Curriculum, Ministry of Education , 1999.

Home Links:

To help your child further their understanding of this science unit, here are some fun activities for you and your family:



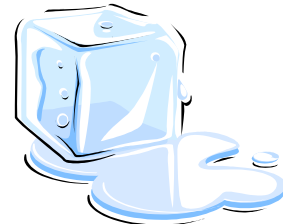
- bake with your child (this demonstrates how solids and liquids mix and make yummy results).
- talk about the different states of water that come down from the sky (rain, snow, freezing rain).
- play with boats in the bathtub and talk about what makes them float.

Happy Adventures,

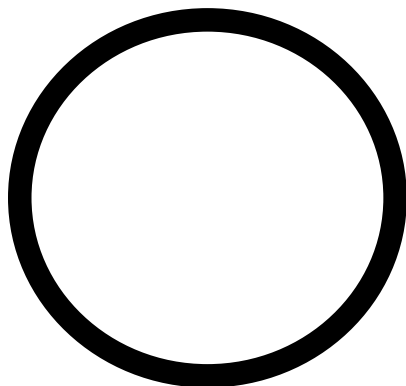
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Properties of Liquids and Solids

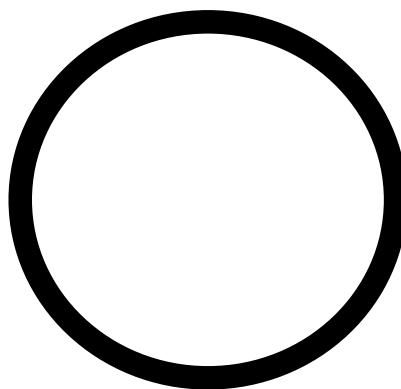
Safety Symbols



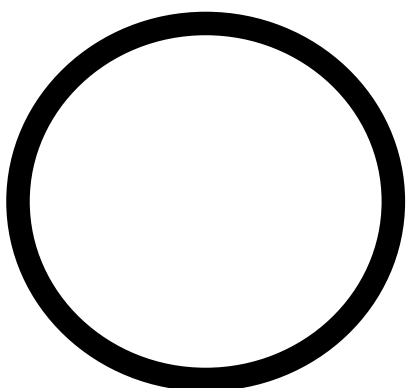
Before we start our liquids and solids unit, there are some important symbols we have to know. Glue the symbol in the correct circle.



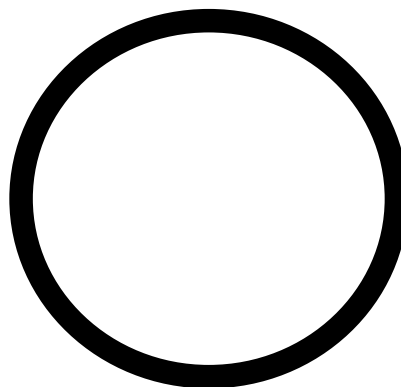
CORROSIVE



POISONOUS



EXPLOSIVE



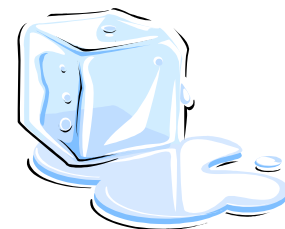
COMBUSTIBLE and
FLAMMABLE

There are some important words we need to know too. Let's write them down on our special notepad below.

A rectangular box containing a small illustration of a blue liquid spill at the top center. Below the illustration are four horizontal lines for writing.

Properties of Liquids and Solids

Looking at Liquids and Solids



As a class let's make a list of liquids and solids we can see around our classroom. Write the list on your special notepad below:

Liquids	Solids

As a class let's make a list describing the properties of liquids and solids. Write the list down on your special notepad below:

Liquids	Solids

Grade 2 MMactivity002 covers:

MM1: describe the properties of liquids and solids, using their observations

MM4: recognize that the states of liquids and solids remain constant in some circumstances (eg. solids remain solid when broken; liquids remain liquid when poured), but may change in other circumstances (eg. liquids may freeze when the temperature drops; solids may melt when the temperature drops; solids may melt when heated)

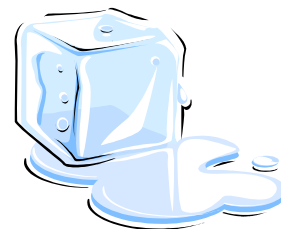
MM14: compare the properties of liquids with those of solids to determine which materials take the shape of their container (eg. water will fill a margarine container completely but ice cubes will leave spaces)

MM20: identify objects in the immediate environment as solids (eg. sand, ice, rocks) or liquids (eg. milk, vinegar, water)

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Properties of Liquids and Solids

The Three States of Water



There are three different states of water; solid, liquid and gas. Using four out of your five senses (look, touch, smell and listen - Do NOT taste) describe the ice and water. Draw what you see. Describe, using words, what you feel, smell and hear. Using only one of your five senses, describe water gas. Draw and describe, using words, what you see. Why would you not be allowed to touch the water gas? _____

Draw a picture			
Describe using words	_____ _____ _____	_____ _____ _____	_____ _____ _____
State	_____	_____	_____

How did we make water vapour? _____

How would we make ice? _____

Grade 2 MMactivity003 covers:

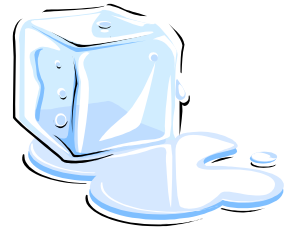
MM3: describe, using their observations, the characteristics of the three states of water, and identify the conditions that cause changes from one state to another (eg. water turns to ice when placed in a freezer)

MM9: ask questions about and identify needs and problems related to the use of liquids and solids, and explore possible answers and solutions (eg. devise and explain a plan to build a model raft; predict changes that will occur when ice or water is heated/cooled)

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Properties of Liquids and Solids

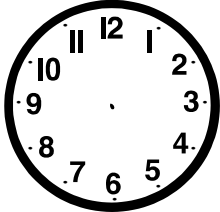
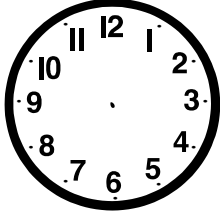
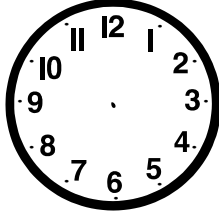
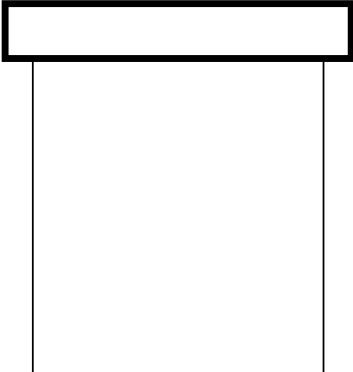
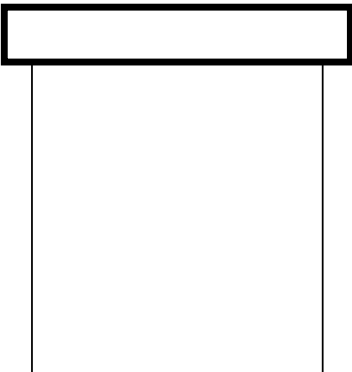
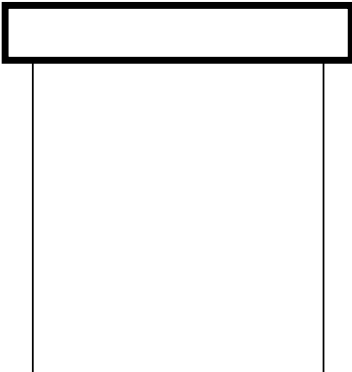
Changing States



Purpose: _____

Materials:
 1) a jar
 2) water
 3) freezer

- Method:
- 1) Pour water into the jar.
 - 2) Draw what the jar looks like and record the time.
 - 3) Place the jar in the freezer.
 - 4) Later that day, take the jar out of the freezer and draw what it looks like and record the time.
 - 5) Leave the jar on a desk.
 - 6) Later that day, draw what it looks like and record the time.

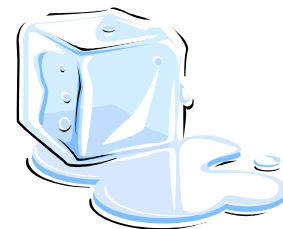
		
		
What will happen when we place it in the freezer? _____	What will happen when we leave it on the desk? _____	_____

Can solids turn into liquids? _____

Can liquids turn into solids? _____

Properties of Liquids and Solids

Looking at Liquids



Materials:
1) a variety of liquids
in plastic cups,
labelled A, B, C . . .

Method:

- 1) Choose a cup of liquid.
- 2) Using three out of five of your senses describe the liquid and fill in the chart below.

Sense	Liquid A	Liquid B	Liquid C	Liquid D	Liquid E
Look					
Smell					
Feel					
I think it is . . .					

Which liquid was your favourite? _____

Why was it your favourite? _____

How is your favourite different than water? _____

Grade 2 MMactivity005 covers:

MM12:record relevant observations, findings, and measurements, using written language, drawings, charts, and concrete materials (eg. record data from experimentation with liquids and solids on a chart; list characteristics of different liquids that they have observed)

MM17:compare the properties of water with the properties of at least one other liquid (eg.. detergent, oil, molasses)

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Properties of Liquids and Solids

Mixing Liquids Together



Purpose: _____

- Materials:
- 1) chocolate syrup
 - 2) juice
 - 3) molasses
 - 4) food colouring
 - 5) oil
 - 6) vinegar
 - 7) liquid soap
 - 8) eight glasses of water
 - 9) eight popsicle sticks

Method:

- 1) Choose a liquid.
- 2) Pour it into a glass of water and stir with a popsicle stick.
- 3) Record the results in the chart below.
- 4) Repeat steps 1 to 3 with a different solid.

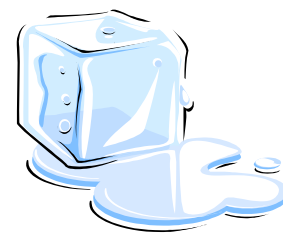
Liquid	chocolate syrup	juice	molasses	food colouring	oil	vinegar	liquid soap
Did it Mix							

What did you learn?

Grade 2 MMactivity006:

MM16:describe, using their observations, the behaviour of various liquids (eg. water, oil) when poured on different surfaces (eg. rough wood, smooth wood, cloth), when combined with solids (eg. powdered milk), and when combined with other liquids (eg. vinegar), and explain how the reactions they observe determine the uses of these liquids and solids

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Properties of Liquids and Solids

Mixing Solids and Liquids

Purpose: _____

- | |
|--|
| Materials:
1) sugar
2) salt
3) sand
4) rocks
5) ice
6) powdered milk
7) soap
8) eight glasses of water
9) eight popsicle sticks |
|--|

- Method:
- 1) Choose a solid.
 - 2) Pour it into a glass of water and stir with a popsicle stick.
 - 3) Record the results in the chart below.
 - 4) Repeat steps 1 to 3 with a different solid.

Solid	sugar	salt	soap powder	sand	rocks	ice	powder milk
Did it Dissolve							

What did you learn?

Grade 2 MMactivity007:

MM2:distinguish between solids that dissolve in water (eg. sugar) and solids that do not (eg. sand)

MM6:identify, through observation, various substances that are buoyant (eg. wood, oil), that can absorb another substance (eg. paper towel), and that can dissolve another substance (eg. water)

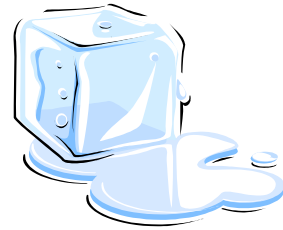
MM12:record relevant observations, findings, and measurements, using written language, drawings, charts, and concrete materials (eg. record data from experimentation with liquids and solids on a chart; list characteristics of different liquids that they have observed)

MM16:describe, using their observations, the behaviour of various liquids (eg. water, oil) when poured on different surfaces (eg. rough wood, smooth wood, cloth), when combined with solids (eg. powdered milk), and when combined with other liquids (eg. vinegar), and explain how the reactions they observe determine the uses of these liquids and solids

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Properties of Liquids and Solids

The Volcano and The Fireworks



Materials:

- 1) a long neck bottle, wrapped in black construction paper and placed on a tinfoil plate (decorations optional)
- 2) 60 mL of baking soda
- 3) 200 mL of vinegar
- 4) red food colouring
- 5) funnel

Method:

- 1) Using the funnel pour the baking powder into the long neck bottle.
- 2) Mix the red food colouring and vinegar together.
- 3) Using the funnel pour the red vinegar into the long neck bottle. Be sure to take the funnel away quickly!

I spy with my little eye:	Describe what happened with words: <hr/> <hr/> <hr/> <hr/> <hr/>
---------------------------	---

What did you learn? _____

Materials:

- 1) a big clear bowl
- 2) a second bowl
- 2) water
- 3) oil
- 4) various colours of food colouring
- 5) spoon

Method:

- 1) Fill $\frac{1}{3}$ of the clear bowl with water.
- 2) In a separate bowl mix the oil and food colouring.
- 3) Pour the oil and food colouring mixture into the water bowl.

I spy with my little eye:	Describe what happened with words: <hr/> <hr/> <hr/> <hr/> <hr/>
---------------------------	---

Grade 2 MMactivity008 covers:

MM16: describe, using their observations, the behaviour of various liquids (eg. water, oil) when poured on different surfaces (eg. rough wood, smooth wood, cloth), when combined with solids (eg. powdered milk), and when combined with other liquids (eg. vinegar), and explain how the reaction they observe determine the uses of these liquids and solids;

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Properties of Liquids and Solids

Making Glue



Purpose: _____

Materials:

- 1) A bowl
- 2) A spoon
- 3) Flour
- 4) Water
- 5) One small, square piece of paper

Method:

- 1) Pour the flour into the bowl.
- 2) Pour the water into the bowl gradually, constantly stirring.
- 3) Place a small bit of paste onto the piece of paper.
- 4) "Glue" the piece of paper inside the box below.

What did the paste feel like? _____

How could you make different coloured glues? _____

Grade 2 MMactivity009 covers:

MM19: describe, using their observations, some ways in which solids and liquids can be combined to make useful substances (eg. flour and water make paste)

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Properties of Liquids and Solids

What is the Quicker Picker Upper?



Purpose: _____

Materials:

- 1) water
- 2) a tin turkey pan
- 3) bond paper
- 4) paper towels
- 5) cotton
- 6) polar fleece
- 7) wood
- 8) plastic wrap

Method:

- 1) Pour some of the water into the turkey pan.
- 2) Wipe it up with one of the materials.
- 3) Record your results in the chart below.
- 4) Repeat steps 1 to 3 for the rest of the materials.

Material	bond paper	paper towels	cotton	polar fleece	wood	plastic wrap
Rating: bad OK good great						

Which material would you use to wipe up a spill? _____

Which material would you not use to wipe up a spill? _____

Grade 2 MMactivity010 covers:

MM6: identify, through observation, various substances that are buoyant (eg. wood, oil), that can absorb another substance (eg. paper towel), and that can dissolve another substance (eg. water)

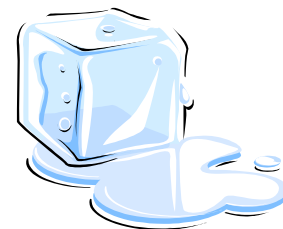
MM15: compare different materials with respect to their capacity to absorb, and identify ways in which this capacity determines how these materials are used (eg. bond paper, paper towels, cotton, linen, wood, plastic)

MM16: describe, using their observations, the behaviour of various liquids (eg. water, oil) when poured on different surfaces (eg. rough wood, smooth wood, cloth), when combined with solids (eg. powdered mild), and when combined with other liquids (eg. vinegar), and explain how the reactions they observe determine the uses of these liquids and solids

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Properties of Liquids and Solids

What's Buoyant?



Let's write down the definition of buoyancy:

Purpose: _____

- Materials:**
- 1) a kitty litter box
 - 2) water
 - 3) wood
 - 4) styrofoam cup
 - 5) paper plate
 - 6) plastic cup
 - 7) paper clip
 - 8) toys from around the classroom
 - 9) cork

- Method:**
- 1) Fill the kitty litter box with water.
 - 2) Choose one object.
 - 3) Make a prediction of whether it will float or not.
 - 4) Place it in the water.
 - 5) Record your results in the chart below.
 - 6) Repeat steps 2 through 5 for the other objects.

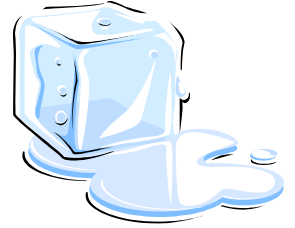
Object	Wood	Styrofoam cup	Paper plate	Plastic cup	Paper clip	Toy	Cork
Prediction (float or sink)							
Results (float or sink)							

If you were going to build a boat, what materials would you use?

Why? _____

Properties of Liquids and Solids

Let's Make a Book

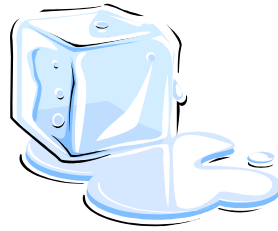


As a class we are going to make a book! In this book we are going to write about our “Properties of Liquids and Solids” science unit. Pick your favourite science activity and describe it using pictures and words.

Grade 2 MMactivity012 covers:

MM13: communicate the procedures and results of investigations for specific purposes, using demonstrations, drawings, and oral and written descriptions (eg. write a booklet for the school library describing class experiments in investigating liquids and solids)

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Solids and Liquids Certificate

This certificate hereby certifies

as a Grade 2 Solids and Liquids expert.

Principal

Teacher

Share your science booklet with at least one family member at home. After you have shared complete the following:

- 1) Cut out your Solids and Liquids Certificate.
- 2) Get the person you shared your science booklet with to fill out the form below, detach it and bring it back to school.

C

_____ shared their science booklet with
the following family members:

Parent's Signature



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