**MATTER GRADE K-Gr 1 SUMMARY**

**Grade K-1 Learning Standards (From BCEd Curriculum)**

**Kindergarten**

* Humans interact with matter every day through familiar materials
* Properties of familiar materials
* colour, texture (smooth or rough), flexibility (bendable or stretchable), hardness, lustre (shiny or dull), absorbency, etc.
* fabric, wood, plastic, glass, metal/foil, sand, etc.

**Gr 1**

* Matter is useful because of its properties
* specific properties of materials allow us to use them in different ways
* solids keep shape; liquids and gases flow
* properties of local materials determine use by First Peoples (local examples: cedar for canoes, mountain goat horns used as spoons, etc.)

**WHAT DO K’s and Gr 1’s need to know about matter?**

The main learning for K’s and Gr 1’s about matter is to distinguish matter from things that aren’t matter (feelings, energy) and to use strong descriptors (but they needn’t be standard) to describe things.

Students can learn to sort materials according to various properties (size, type of material, shape, texture, temperature, natural or synthetic).

Students should start to be able to think like scientists by observing, describing and sorting materials around them. Do simple experiments as suggested below, but have them use the vocabulary to have follow up discussions. Take opportunities for age-specific drawing and (where possible) writing of observations.

Grade ones should be able to describe Solids, Liquids and Gases from a very general perspective—able to classify materials into these 3 forms (they don’t need to know about the particle basis of this classification).

**CURRICULAR COMPETENCIES**

Questioning and predicting-ask questions, make simple predictions about familiar objects & events

Planning and conducting-make exploratory observations of the local environment based on senses, make simple measurements (perhaps using non-standard units)

Processing and analyzing data and information-discuss observations; represent observations by drawing, compare observations and predictions; moving towards identifying simple patterns and connections.

Evaluating-compare my observations with those of others; consider the environmental consequences of my actions

Applying and innovating-I can take part in caring for myself, family, classroom and school; apply learning to new situations; introduce new or refined ideas

Communicating-I can share my scientific understanding orally, in drawing and moving towards writing; I can express and reflect on personal experiences of place

**WHY IS IT IMPORTANT?**

Being able to describe and identify matter is a key skill in terms of starting to learn how to collect evidence from the world around them and identify it. As they move into Grade 1, being able to identify how the properties of items make them useful for their purpose is an important skill.

**KEY VOCABULARY**

Property-a characteristic or trait of a substance

Matter-any physical substance

Shape-the outward form of an object

Size-how big or small an object is

Texture-rough, smooth, fuzzy, slippery

Flexibility—bendable, stretchable,inflexible

Natural materials—thinks formed in nature

Hardness—sort, hard, squishy, sharp

Lustre—shiny, dull

Colour

State—solid, liquid, gas

**SOME INQUIRY QUESTIONS**

* What is matter and what is not?
* How can I describe things so others understand?
* What properties of material are useful?
* How can I investigate the properties of material?
* What natural materials can be used for survival purposes? (Warmth, shelter, clothing, food, water carrying)

**SUGGESTED PROVOCATIONS/ACTIVITIES/EXPERIMENTS**

Read ***Comparing Properties*** by Charlotte Guillain and use this to help understand the properties of matter.

Sort a variety of materials from around the classroom, from items around the home or from outside using a paper Venn diagram t or hula hoops. Sort based on natural vs. synthetic or using the materials characteristics (heavy or light; rough or smooth; stiff or bendable; float or sink; soft or hard; hot or cold), or what materials are composed of (wood, metal, plastic, fabric, glass, rock, and water).

Create an explosion in a bag to explain the three states of matter! LIQUID—Pour 1/4 cup of warm water into a ziploc bag. Next add 1/2 cup of vinegar to the water (food colouring optional). SOLID—In a tissue, dump 3 tsp. of baking soda. Fold the tissue up like a square. Then close the bag up, leaving space to drop the pouch. Zip it up, let go of the pouch, and watch the bag expand—GAS! Soon the bag will look like a giant bubble. Hold it up and look what’s happening inside, an acid-base. Do a variety of experiments which demonstrate changing states of matter back and for, such as water, juice or chocolate (solid, liquid and gas states).

Using M&Ms, smarties or gummy bears, investigate the following questions. What happens when one candy is placed in water? Do some colors dissolve in water faster than others? What would the colors look like if we place two or more candies in the water? Does the temperature of the water affect how fast the candy dissolves? Have the students create science questions of their own to investigate as well.

**CROSS-CURRICULAR CONNECTIONS**

Using the Three Little Pigs story, look at the three types of materials the pigs used to protect themselves from the wolf. Which was the strongest? Why? Have the students choose a material to build a house to protect themselves from the wolf’s strong wind. What material would they choose and why?

Cook—make butter or ice-cream, describe the properties of the food as it changes. <https://www.instructables.com/id/How-to-Make-Homemade-Ice-Cream-in-a-Bag/>

Explore some chemistry and art connections here: <https://www.acs.org/content/acs/en/education/students/highschool/chemistryclubs/activities/art-and-chemistry.html>

**INDIGENOUS PERSPECTIVES**

Go on a walk to a local beach and collect some shells (be sure to clean the shells before use) that would work as bowls. Make dandelion tea and use the bowls to serve it in. Information on teas can be found in the FNESC Science First Peoples resource, chapter 2: <http://www.fnesc.ca/wp/wp-content/uploads/2015/08/PUBLICATION-61496-Science-First-Peoples-2016-Full-F-WEB.pdf>

Use cedar as a material to explore and look at ways it was traditionally used in West Coast life throughout the seasons. Cedar was used for clothing, rot resistant canoes, water tight baskets, making rope, medicines, fish traps, tools and art. Go on a trip and look at the cedar tree. Notice the bark. Notice the scent. Have an elder or district AbEd teacher come in to do cedar weaving with the students.

Story of Cedar <https://www.youtube.com/watch?v=H_lVHL4eYqM>

**RESOURCES**

Think Like a Scientist:

<https://www.education.com/lesson-plan/think-like-a-scientist-observe-sort-and-classify/>

Sesame Street experiments: <http://www.sesamestreet.org/toolkits/stem/experiments>

and a guide to go with: <http://www.sesamestreet.org/sites/default/files/media_folders/Images/STEM_EXP_EdGuide.pdf>

This kitchen science teacher’s guide is full of quick easy inexpensive experiments:

<https://eclkc.ohs.acf.hhs.gov/school-readiness/article/kitchen-science>

Properties of liquids vs. gases: <https://www.scienceworld.ca/resources/activities/incompressible-water>

Heating and cooling of wax: <https://www.scienceworld.ca/resources/activities/candles>

States of matter unit from science world: <https://www.scienceworld.ca/resources/units/states-matter>

This is a great chemistry resource with detailed background and several different series of inquiries that deepen as your students learn: <http://www.inquiryinaction.org/pdf/InquiryinAction.pdf>

And these resources from Comox School District (including links to French resources): <https://portal.sd71.bc.ca/group/wyhzgr4/Pages/default.aspx>