

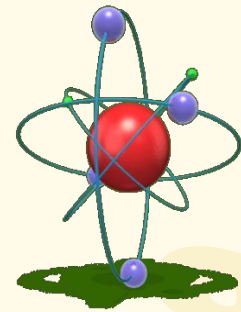


Grade 2

SCIENCE IMPLEMENTATION

Matter

JUNE 13 2023

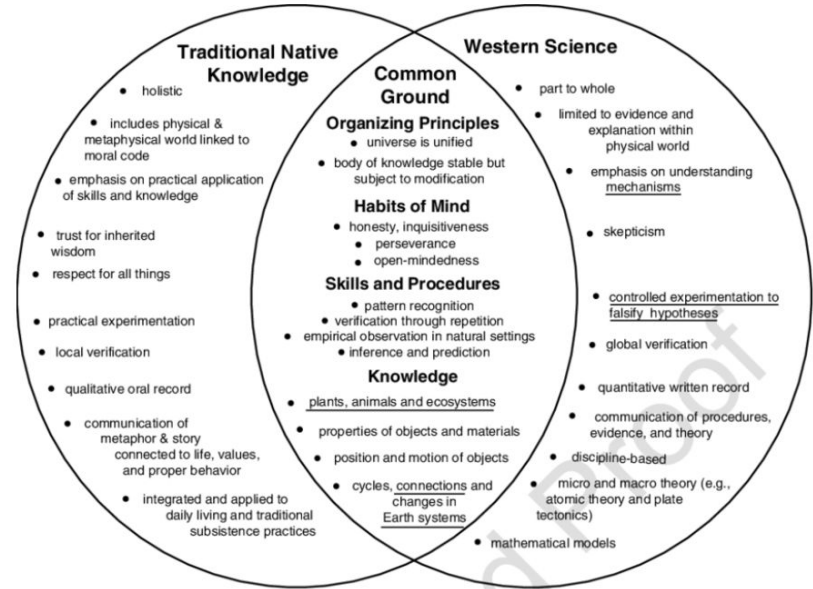




Acknowledgment of Land and People



In the spirit of reconciliation, we want to acknowledge that this gathering is taking place on traditional lands across the province of Alberta, home to many diverse First Nations, Métis and Inuit peoples. We acknowledge that this land is a traditional meeting ground giving voice to its original peoples and the story of creation of this country in a way that history has forgotten.



Similarities and differences between traditional Native knowledge and western science (Sparrow et al. 2006) (Modified with permission from Stephens (Stephens 2000), with the modifications underlined)

In book: [Linking Ecology and Ethics for a Changing World \(pp.49-62\)](#). Publisher: Springer. December 2013

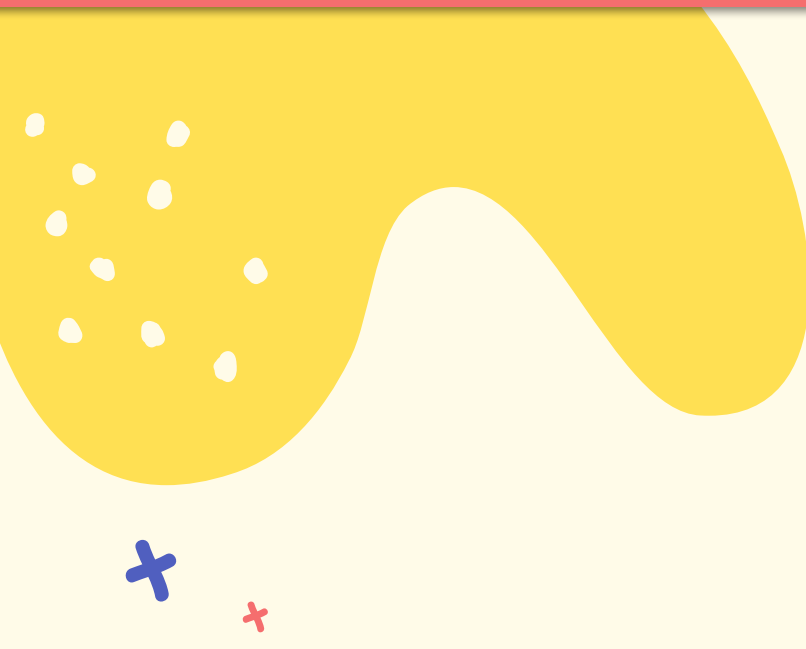
DOI: [10.1007/978-94-007-7470-4_4](https://doi.org/10.1007/978-94-007-7470-4_4)

[Abridged Source: Researchgate.net](#)

AGENDA

01	Backgrounder • Phases of Learning
02	Understanding #1 • Surface & Deep
03	Understanding #2 • Surface & Deep
05	Assessment
06	Integrating Computer Science • Skills and Concept
07	Resources

A Quick Look Back to Kindergarten



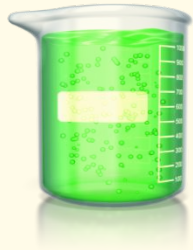
Understanding what they
would have come from
Kindergarten knowing
already!

SKILL SORT

What does it mean to SORT?

Introduction to Sort

KM1 Children examine properties of natural or constructed objects.



KM1.1 What makes an Object an Object?



Characteristics

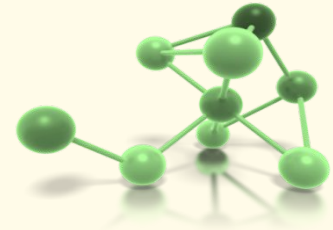
Properties



Describe & Sort



Experiment & Critical Thinking
Design
Compare & Contrast



KM 1.2 How do we interact with Matter?



Senses & Associated Terminology

An Object

- anything you can see or touch
- anything that can be perceived using senses.



A Property

- characteristics of objects including
 - colour
 - size
 - shape
 - texture

Allow students to discover and verbalise their own characteristics in a sort.

Let's Sort



Colour
Food
Instruments
people
things outside
smelly things



Create a word chart for how students grouped their items. Many will be used in properties and with the senses activities. Continue to build on the word chart as you move into senses.

Our Senses

Let's learn more about each



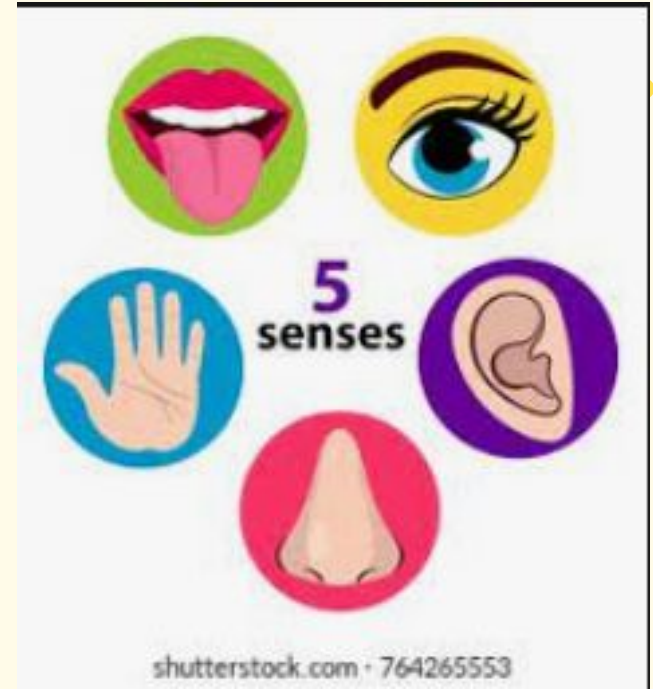
Sight

Hearing

Touch

Smell

Taste



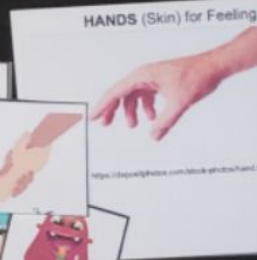
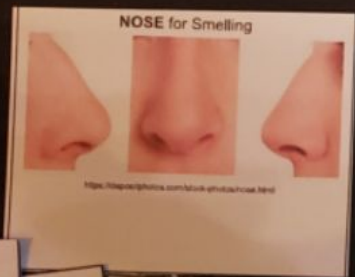
***Listen carefully
and see if you can
remember the 5
Senses!***



**The Five Senses | The Dr. Binocs Show | Educational
Videos For Kids - Peekaboo Kidz**

Five Senses - The Kiboomers Kids Learning Song

Five Senses: Taste, Smell, Sight, Hearing, Touch - Quiz for Kids.



Senses Chart

Make an ongoing list of describing words

Sight

bright, dark, dull, dim, colour, position

Touch

smooth, flat, wet, damp, dry, hard, flabby, gummy, sticky, woolly, spongy, velvety, furry, silky, soft, cold, cool, chilly, hot, warm, slippery, slimy, greasy, oily, rough, bumpy, pointed, sharp

Smell

stinky, nice, pleasant, sweet, fruity, perfume, floral.

Hearing

loud, soft, quiet, noisy,

Taste

sweet, salty, sour, yucky, yummy, bitter

Unpacking Our Senses: Relating **Senses** and **Properties**

S
E
N
S
E

Sight

- colour
- size
- shape
- texture
- shade or lightness/darkness

bright, dark, dull,
dim, colour,
position

Hearing

- sound

loud, soft, quiet, noisy,

Smell

- scent

stinky, nice, pleasant,
sweet, fruity,
perfume, floral.

**Touch
Holding**

- texture
- shape
- temperature
- weight

smooth, flat, wet, damp,
dry, hard, flabby,
gummy, sticky, woolly,
spongy, velvety, furry,
silky, soft, cold, cool,
chilly, hot, warm,
slippery, slimy, greasy,
oily, rough, bumpy,
pointed, sharp

Taste

- sweet
- sour
- bitter
- salty
- umami (savory)

sweet, salty, sour,
yucky, yummy, bitter,
sweet, sour, bitter,
salty, umami (savory)

P
R
O
P
E
R
T
Y

D
E
S
C
R
I
B
I
N
G

W
O
R
D
S

How do the properties affect design? (Kindergarten)



Wooden geometric solids



Stem Building Blocks



Stacking Rocks



Quick Look Back

Extending the Kindergarten
Understandings into Grade 1

Considerations

Science

1M 1.1/1.2 Students analyze properties of objects and investigate how they can be changed.

- Measurable properties of objects include: length, how much flat space an object covers(area), weight(mass)
- Ask questions about observed objects.
- Identify measurable properties of objects.
- Directly compare the length, area, and weight of various objects.
- Properties that can be changed include: length, area, weight(mass), shape, & texture

Math

1G1 Students interpret shape in two and three dimensions.

- Sort shapes according to one attribute and describe the sorting rule.
- Compose and decompose two- or three-dimensional composite shapes. (Kindergarten link)
- Compose and decompose two- or three-dimensional composite shapes.
- Identify familiar shapes within two- or three- dimensional composite shapes.

1M1.1/1.2 Students relate length to the understanding of size.

- Recognize the height, width, or depth of an object as lengths in various orientations.
- Compare and order objects according to length.
- K: Indirect comparison is useful when objects are fixed in place or difficult to move.
- Comparisons of size can be described by using words such as: higher, wider, deeper.
- U: Length is a measurable attribute that describes the amount of fixed space between the endpoints of an object.
- U: The size of two objects can be compared indirectly with a third object.
- S: Order objects according to length, area, or capacity.

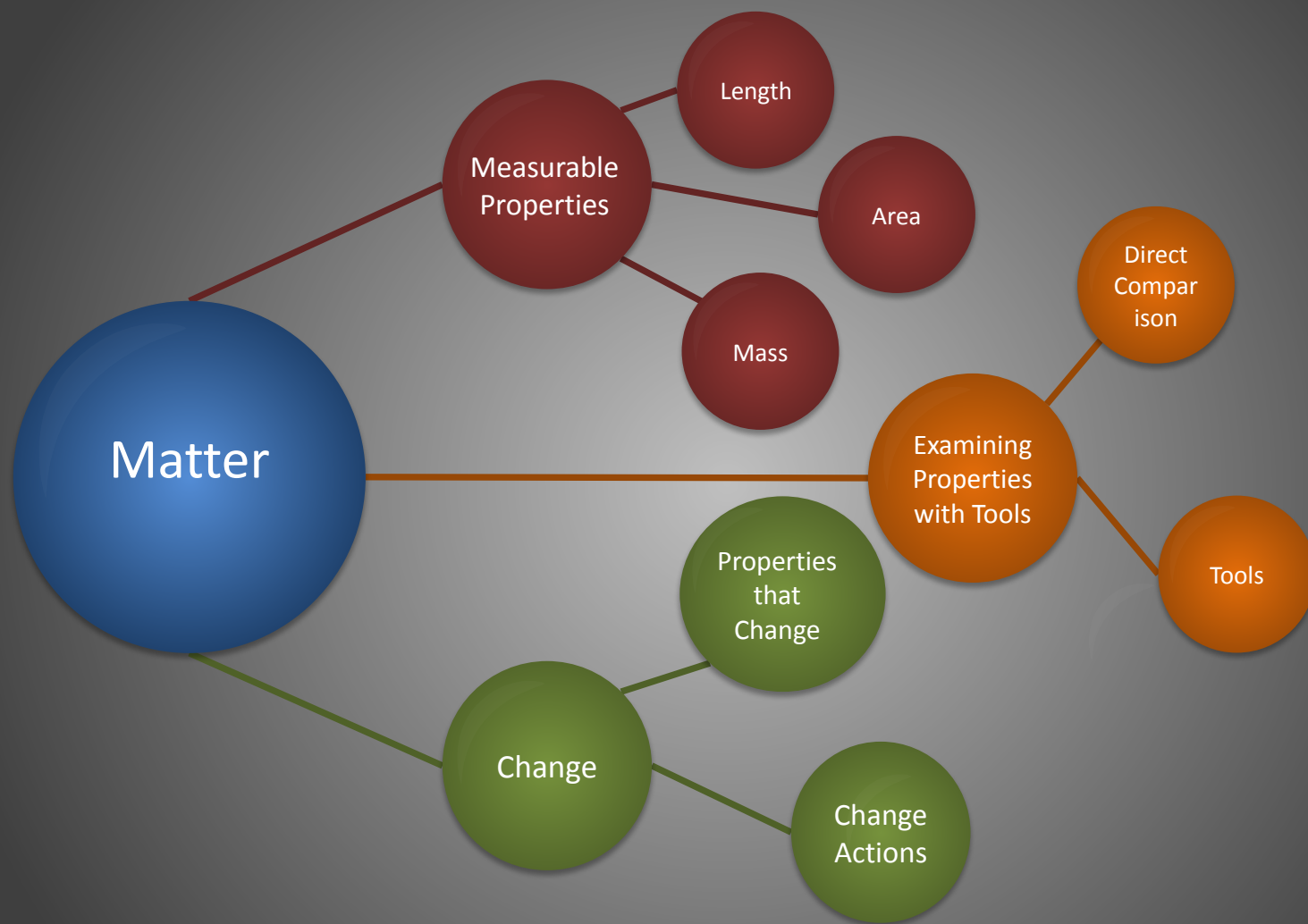
Number: Represent quantities using words, numerals, objects, or pictures.

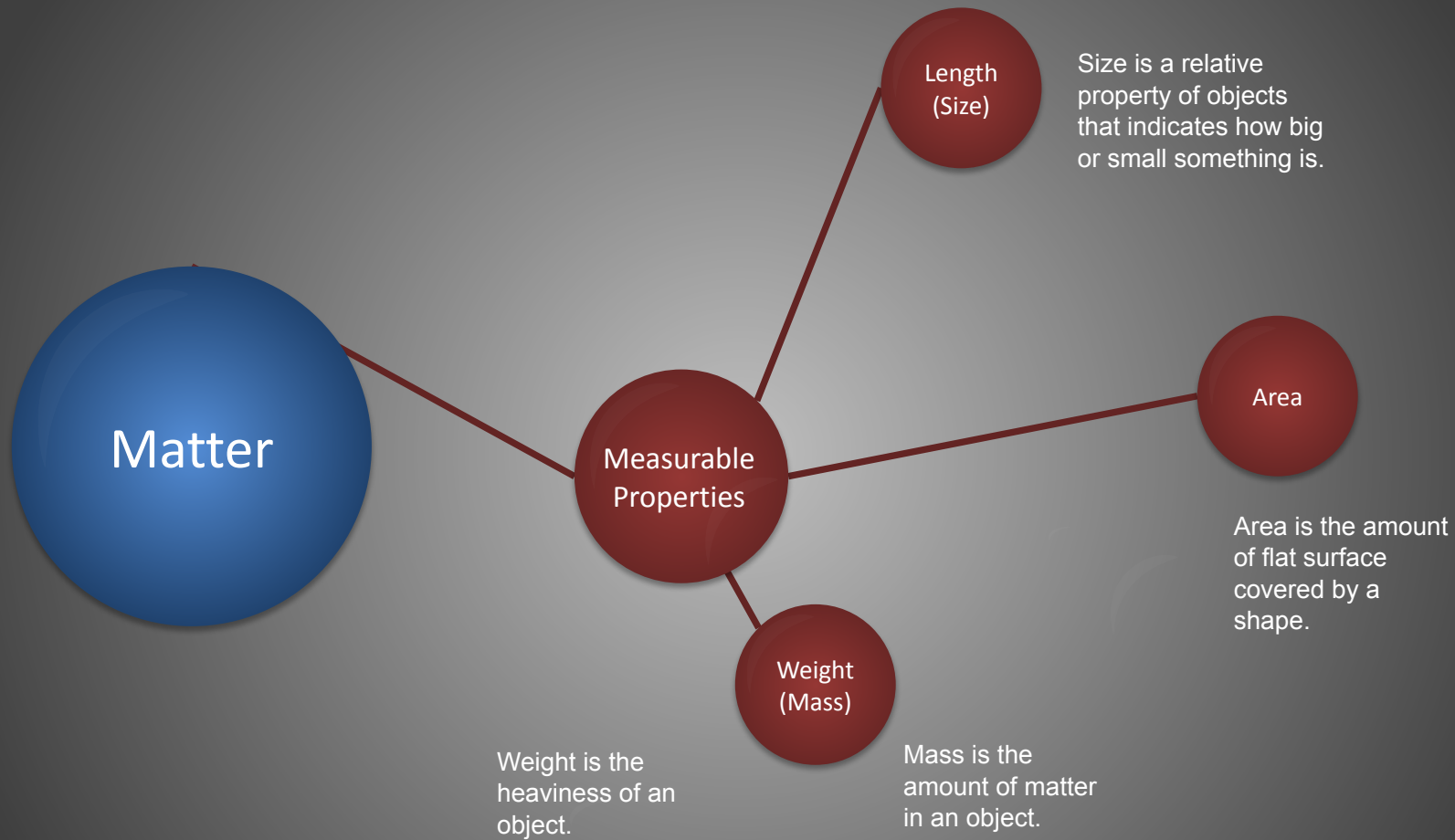
1ST1.1 Students investigate and represent data.

- S: Share wonderings about people, things, events, or experiences.
- U: Data can be answers to questions.

Concept Properties







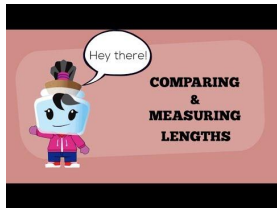
LENGTH - comparative language, directly compare



https://www.123rf.com/photo_74759718_toy-cars-collection-on-carpet-sorted-by-color-transportation-airplane-plane-and-helicopter-toys-for-.html



<https://www.hand2mind.com/>



Comparing and
Measuring Length



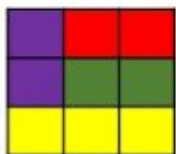
<https://www.healthline.com/health/how-to-measure-height>



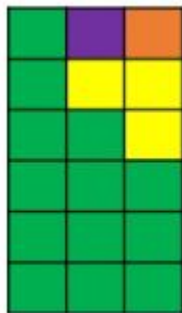
<https://www.amazon.ca/Midwest-Hearth-Decorative-Twig-Set>



<https://stressfreemathforkids.com/>



Purple = ____ squares
 Yellow = ____ squares
 Green = ____ squares
 Red = ____ squares

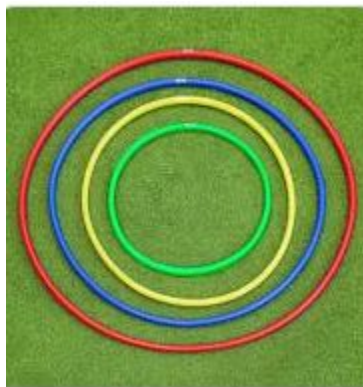


Purple = ____ squares
 Yellow = ____ squares
 Green = ____ squares
 Orange = ____ squares

Source: Master the [Curriculum](#)

AREA

comparative language,
 directly compare



<https://www.networldsports.ca/hula-hoops>



<https://www.amazon.ca/Merrithew-Agility-Hoops-Set->



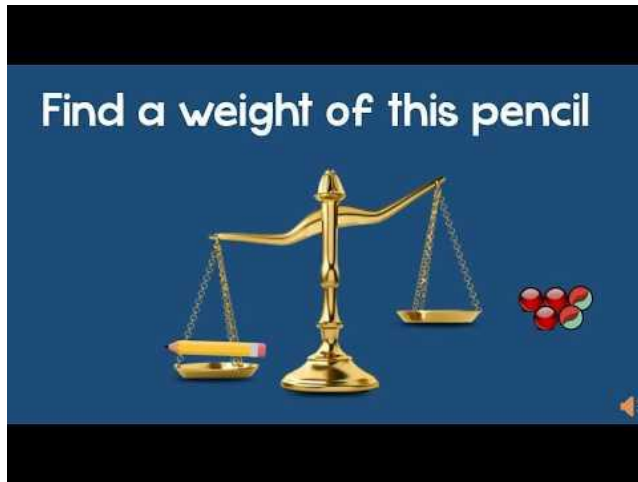
<https://www.vecteezy.com/free-vector/soup-can>
<https://pngtree.com/so/tea-box>



What is the difference between **mass** and **weight**?

- Weight is different from mass.
- Weight is the heaviness of an object. Weight is the measure of the force of gravity on an object.
- Mass is the amount of matter in an object. The mass of an object will never change, but the weight of an item can change based on its location.





Mass

Balloon Balance Experiment

How to put a pin in a balloon without popping it.

Videos below can be used in Grade 2 as well - nonstandard measure.

TOOLS



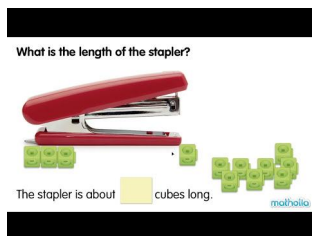
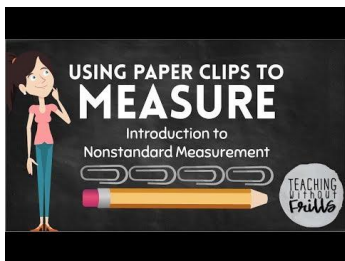
Mrs. [Genua's](#) Grade 1 Class (Linear measurement)



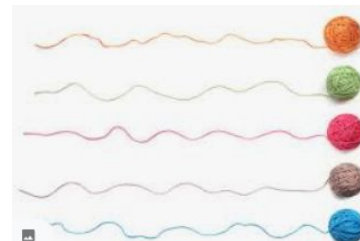
pixabay.com-vectors-30363/



<https://brownbagteacher.com/using-cuisenaire-rods/>



https://www.123rf.com/photo_15405016



<https://www.istockphoto.com/photos/yarn-string>

Physical Changes (video and card sort)

Watch the video then take the card sort and decide which physical change is being shown. Do any belong in more than one space?



Physical Changes Song -
ScienceExplosion

Length

Area

Weight

Texture

Shape

Physical Changes (recording sheet)

Using your cards, which physical change is being shown? Write the card number under the correct 'Change'. Are there numbers that fit under more than one change?

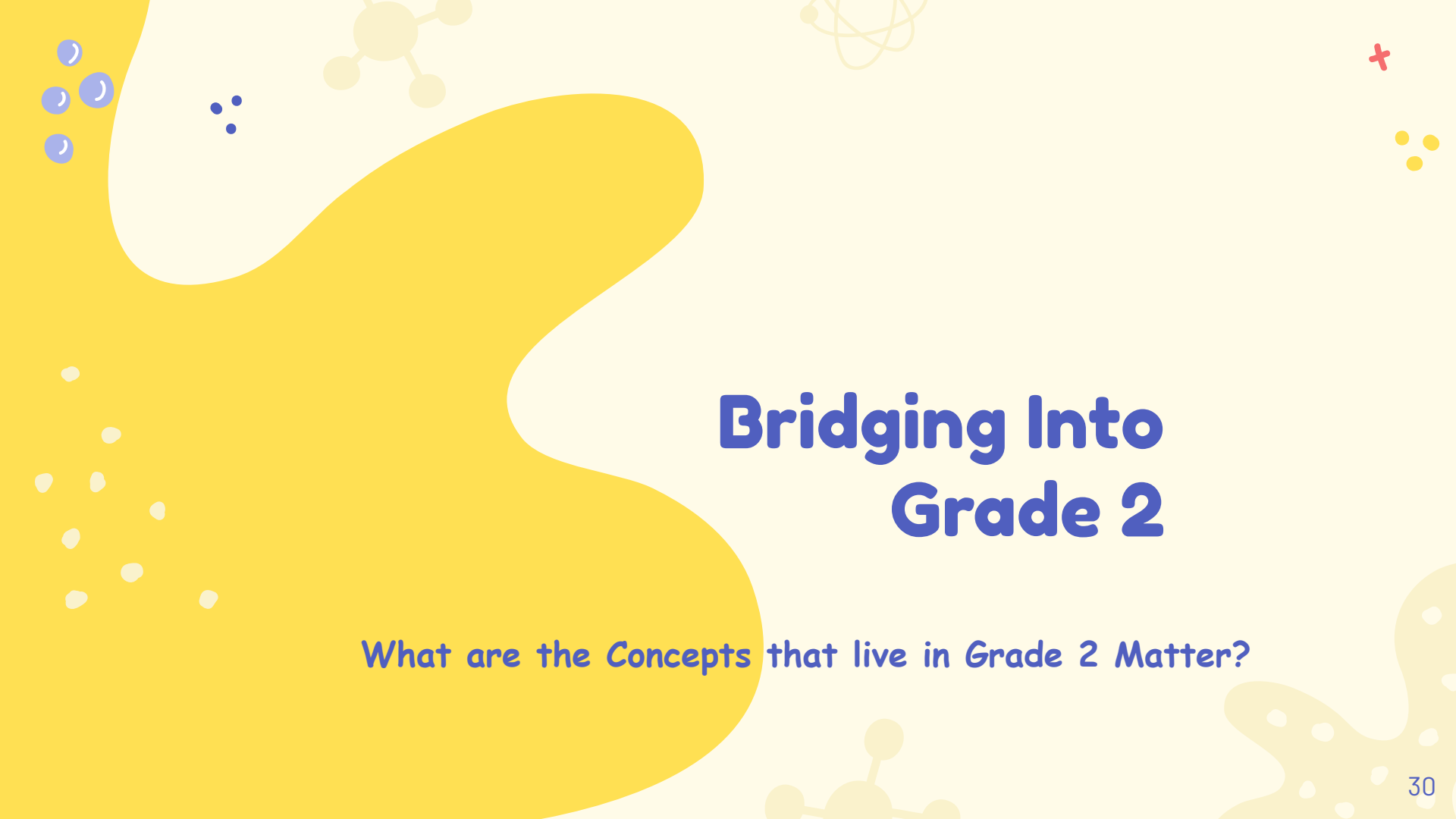
Shape

Length

Area

Weight

Texture



Bridging Into Grade 2

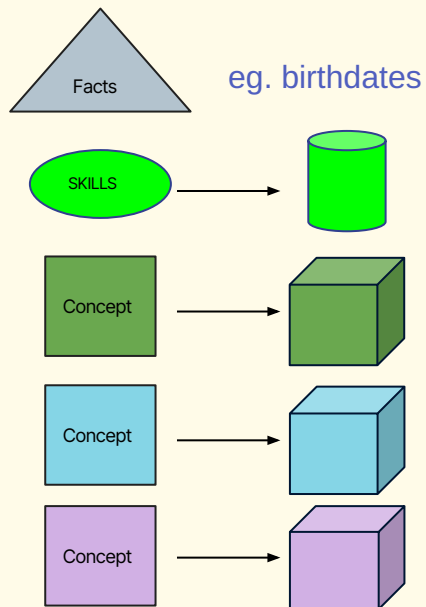
What are the Concepts that live in Grade 2 Matter?

Phases of Learning

Hattie, Fisher & Frey: *Visible Learning for Literacy* (2016)

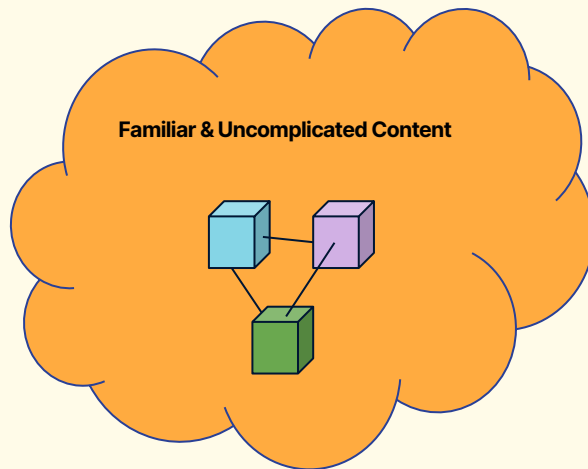
* Surface

Students are first exposed to individual skills, concepts and their related knowledge.



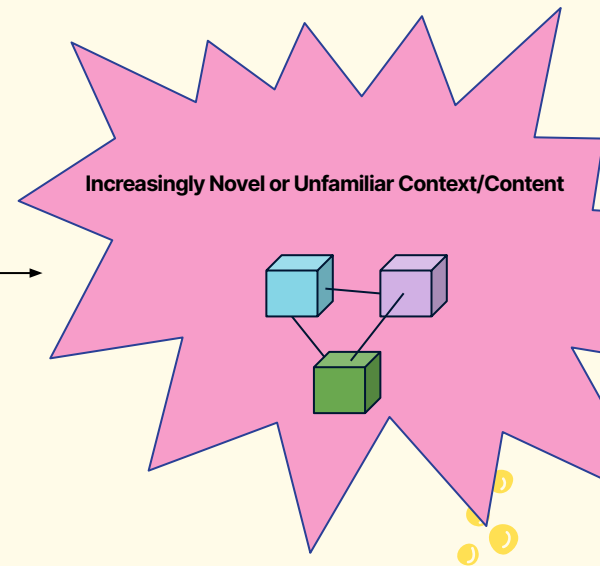
Deep

Students begin making connections between concepts to create deeper understanding and applying skills/procedures to new situations



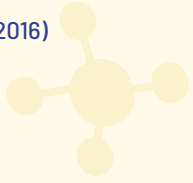
Transfer

Applying understandings and skills to a variety of novel and unrelated contexts.



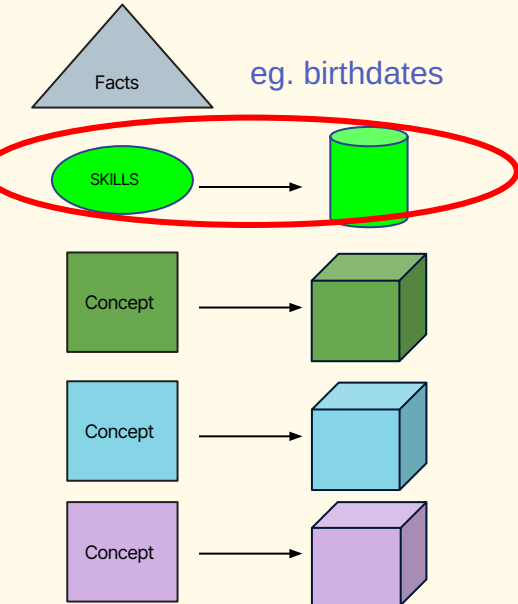
Phases of Learning

Hattie, Fisher & Frey: *Visible Learning for Literacy* (2016)



+ Surface

Students are first exposed to individual skills, concepts and their related knowledge.



SKILL

- A skill refers to a learned ability to perform a particular task or activity effectively (eg. sorting).

PROCEDURE

- A procedure is a sequence of steps or actions to be followed in a specific order to achieve a particular outcome (eg. investigating).
- The individual steps may be specific skills.



Skills & Process Verbs

	Grade			
	K	1	2	3
Ask Questions				
Classify (Sort)				
Compare & Contrast				
Conclude				
Create				
Demonstrate Safety				
Describe				
Design				
Discuss				
Examine				
Explain				
Explore				
Investigate				
Observe				
Predict				
Record Data				
Relate				
Represent				

Skills & Procedures Verbs

Skills and procedures verbs are those identified in the Skills & Procedures column of the curriculum guide.

This list represents the more frequently used verbs.

- A darker shade signifies a verb used directly in a Skills and Procedures statement.
- A lighter shade indicates that verb is not stated as a separate skill, but is included in procedure (eg. "Ask Questions" is a step in the "Investigation" procedure at every grade)

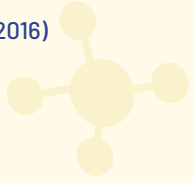
Instruction and Assessment

These skills and procedures can be taught, practiced, and assessed.

Doing so will help students become more proficient in their use and better able to demonstrate their knowledge and understanding when using these skills.

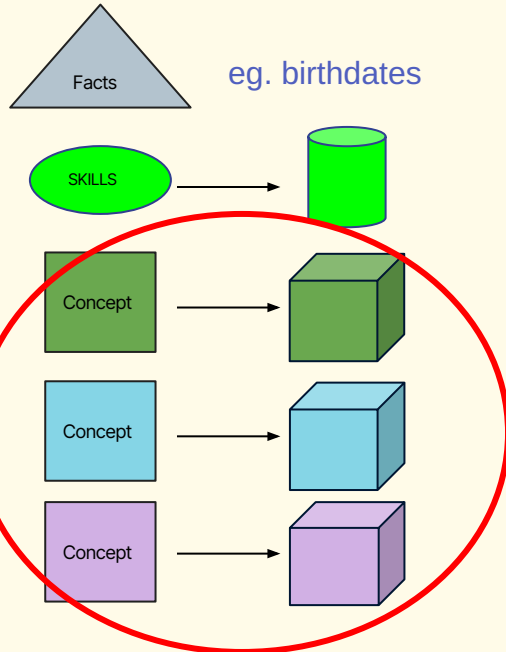
Phases of Learning

Hattie, Fisher & Frey: *Visible Learning for Literacy* (2016)



* Surface

Students are first exposed to individual skills, concepts and their related knowledge.



A concept is ...

- an organizing idea of 1-2 words;
- with distinct attributes;
- that are shared across multiple examples.



Photo by [Fernando Andrade](#) on [Unsplash](#)

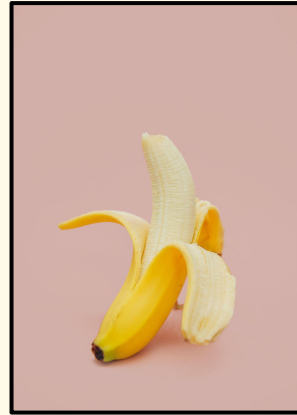


Photo by [charlesdeluvio](#) on [Unsplash](#)



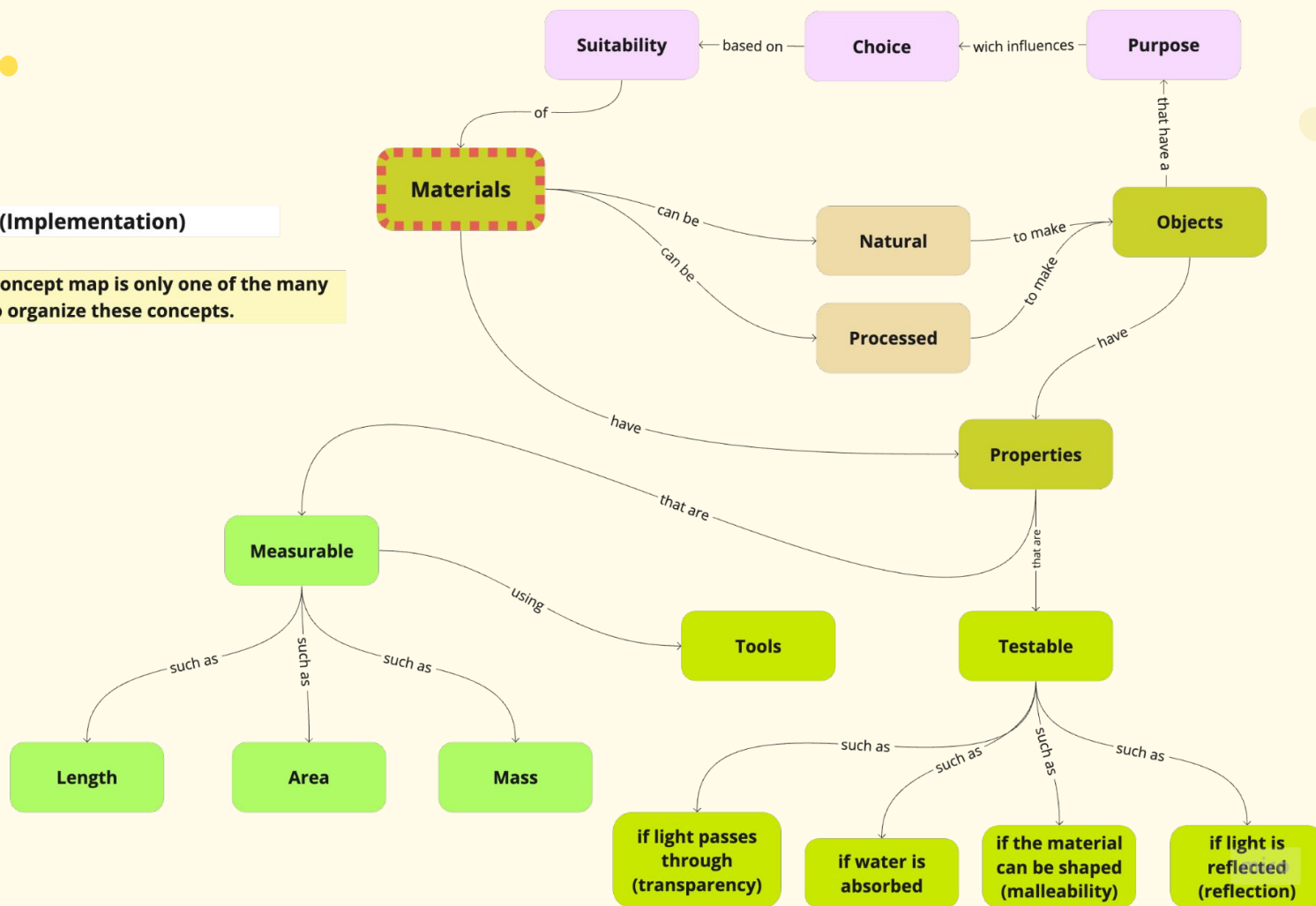
Orange: Photo by [Dessy Dimcheva](#) on [Unsplash](#)



Photo by [Sami Ahmed](#) on [Unsplash](#)

Matter Grade 2 (Implementation)

Note that this concept map is only one of the many possible ways to organize these concepts.



Concept Progressions

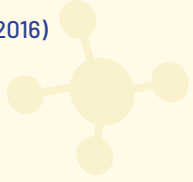
Science Curriculum (March 2023)

Kindergarten to Grade 6

Matter						
Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Guiding Question: How can properties of an object be distinguished from one another?	Guiding Question: How can properties of an object be altered?	Guiding Question: How can the suitability of materials be determined?	Guiding Question: How can materials change?	Guiding Question: How can materials be managed safely?	Guiding Question: How can states of matter and other physical properties be explained using the particle model of matter?	Guiding Question: How can the particles of matter be influenced by heating or cooling?
Learning Outcome: Children examine properties of objects.	Learning Outcome: Students analyze properties of natural and constructed objects and investigate how they can be changed.	Learning Outcome: Students investigate the properties of materials and relate them to a purpose.	Learning Outcome: Students investigate and analyze how materials have the potential to be changed.	Learning Outcome: Students investigate the management of waste and dangerous materials and describe environmental impacts.	Learning Outcome: Students investigate the particle model of matter in relation to the physical properties of solids, liquids, and gases.	Learning Outcome: Students investigate how particles of matter behave when heated or cooled and analyze effects on solids, liquids, and gases.
KEY CONCEPTS				KEY CONCEPTS		
Object	Change: Physical (eg. bending, twisting)	Material: Combining	Change: melting, freezing, evaporation, condensation	Impact: Environmental	Attractive Force	Attractive Force
Properties: Observable	Weight	Measurement	Change: permanent, reversible	Production & Consumption	Behaviour of Particles: movement & arrangement	Behaviour of Particles: movement & arrangement
Senses	Object: Natural	Object	Cycle	Responsible Use & Disposal	Particle Model of Matter	Expansion & Contraction
Similarities	Object: Processed	Properties: Testable (eg. transparency, malleability)	Cycle: Water	Symbols: Hazard (explosive, flammable, corrosive, poisonous)	Properties: Physical (state mass, volume, density, compressibility)	Heating & Cooling
Difference	Properties: Measurable (eg. area, length)	Material Purpose	Evaporation	Waste Material	State of Matter: solid, liquid, gas	Particle Model of Matter
	Properties: Changeable (eg. shape, texture, area)	Material Suitability	Interaction	Waste Management Methods (landfills & composting & recycling)	SI units	Temperature Tools: thermometer
	Senses	FNMI: Objects from Natural Material	Material: Natural & Processed			Phase Change
	Tools	FNMI: What informs use of materials	Matter			
		FNMI: What informs use of materials	Properties			
			State of Matter: solid, liquid, gas			
			FNMI: Relating to land, plants, and animals as equals			
			FNMI: Interaction with natural materials for a specific purpose.			

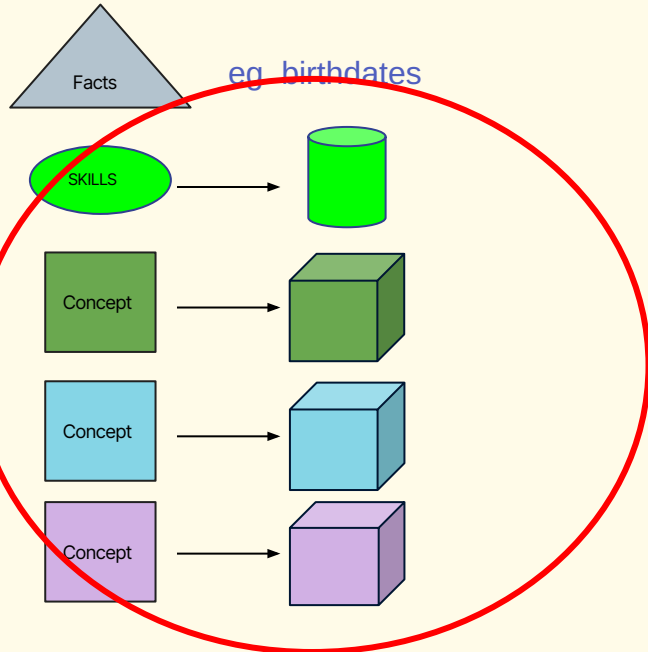
Phases of Learning

Hattie, Fisher & Frey: *Visible Learning for Literacy* (2016)



+ Surface

Students are first exposed to individual skills, concepts and their related knowledge.

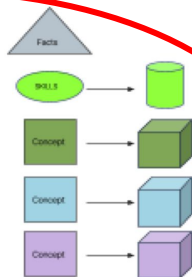


Grade 2 Matter

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.1 & 1.2	Materials are used to make objects. (From 2M1.1) Properties of materials that can be tested include - if light passes through (transparency) if water is absorbed - if the material can be shaped (malleability) - if light is reflected (reflection) Various properties of materials can be measured, including length and weight (mass).	Materials can be combined in a variety of ways to make objects. Materials have unique properties.	Test properties of various materials. Measure various materials using non-standard measurements. <i>Identify the materials used to make various objects.</i>

~ material
~ testable property

~ property
~ measurable property
~ observable property
~ object



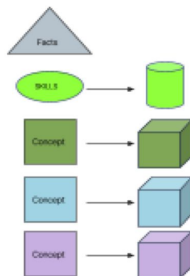
SURFACE 1: Concepts

Grade 2 Matter

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.2	Materials are used to make objects. Properties of materials that can be tested include - if light passes through (transparency) if water is absorbed - if the material can be shaped (malleability) - if light is reflected (reflection) Various properties of materials can be measured, including length and weight (mass).	Materials can be combined in a variety of ways to make objects. Materials have unique properties.	Test properties of various materials. Measure various materials using non-standard measurements. <i>Identify the materials used to make various objects.</i>

~ material
~ testable property

~ property
~ measurable property
~ observable property
~ object



~ test
~ measure

SURFACE 2: Skills/Procedures

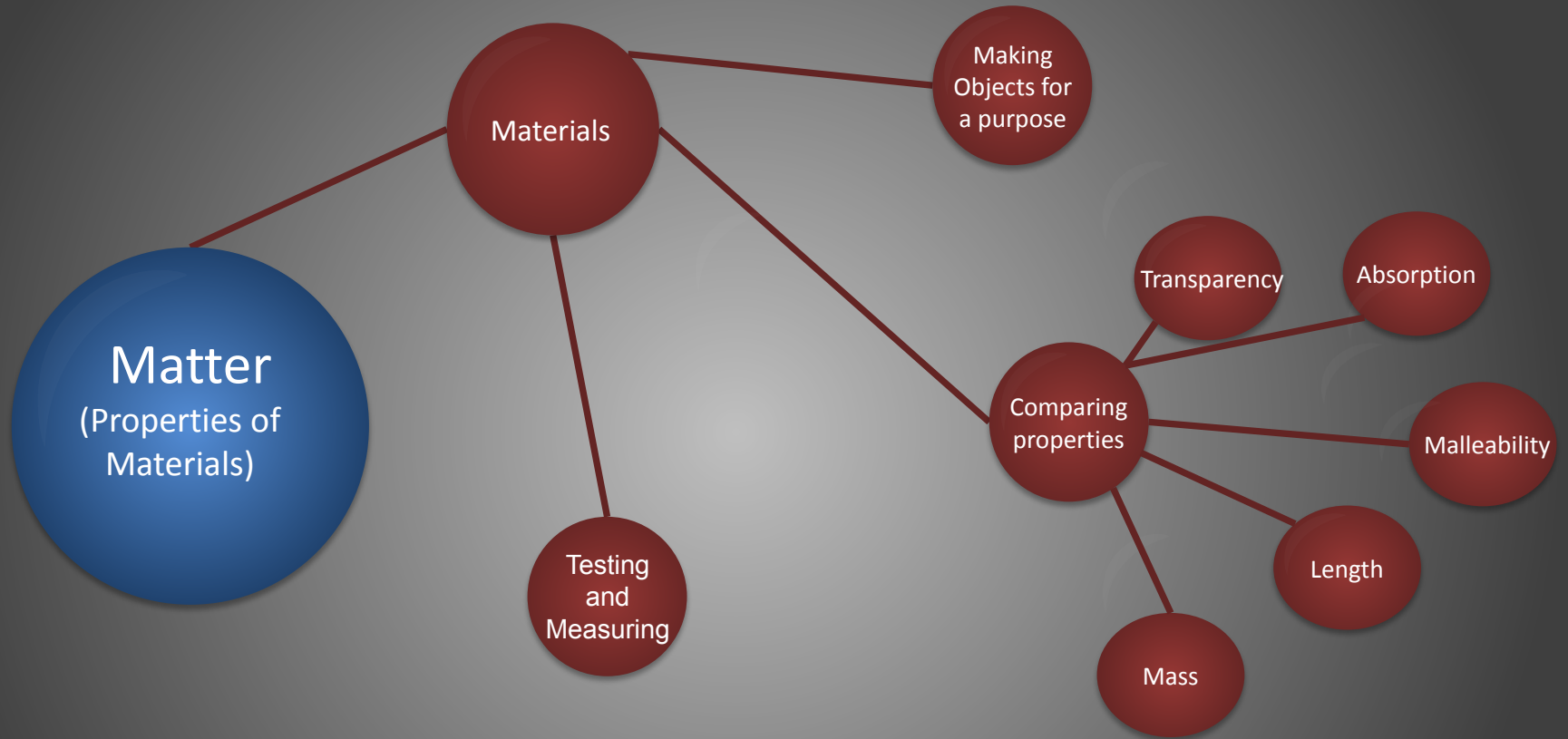
SURFACE

Concepts and Skills



Bridging Into Grade 2

Material Properties: Which Material Makes
the Strongest Bridge?



Concept Materials



Types Materials and Their Properties

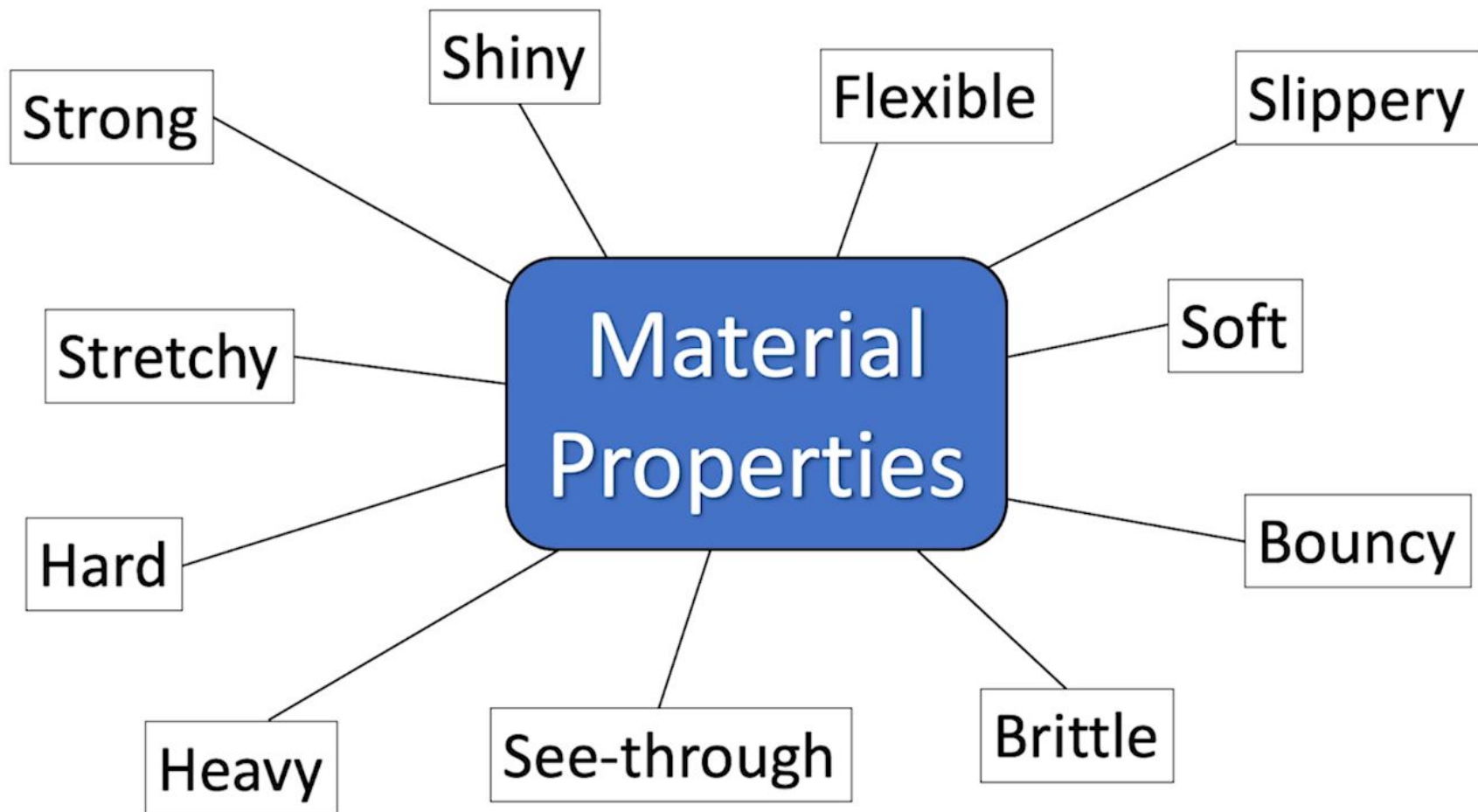
Watch the video *Materials for Kids/Materials and their properties/What are things made of.*

- pause the video at each question to gather student input and to formatively assess their understanding

Have some items from the video on hand that you can:

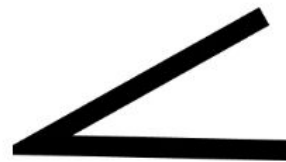
- further examine the materials (labels, how to know what something is made of)
- talk about some items not in the video - discuss what they might be made of.



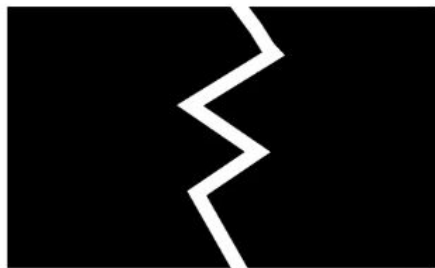




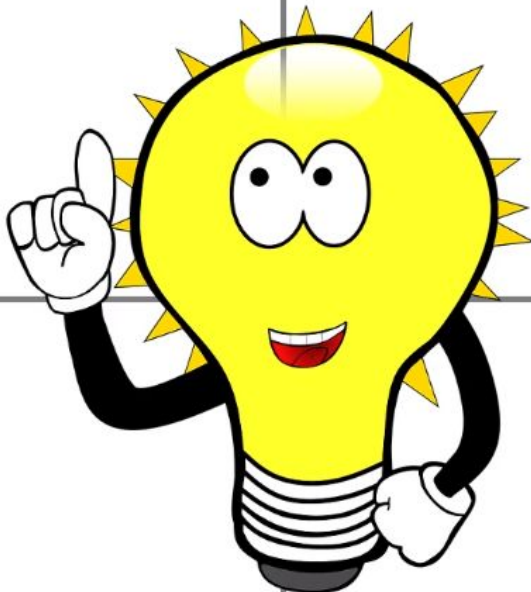
Bending



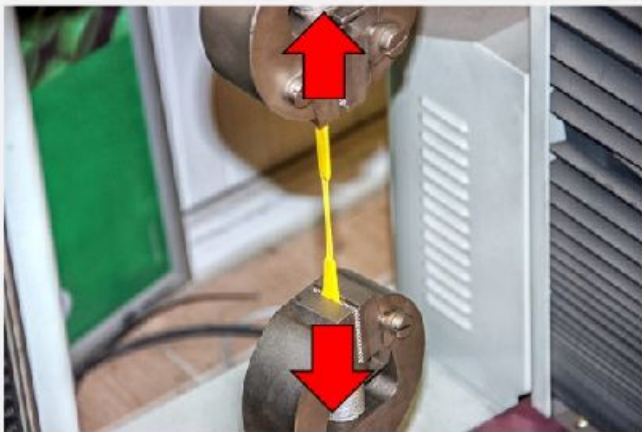
Folding



Tearing



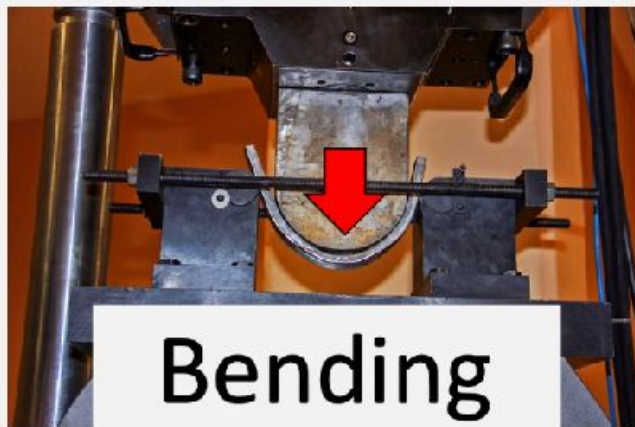
Pulling



Pulling



Pushing



Bending

Skill

Testing

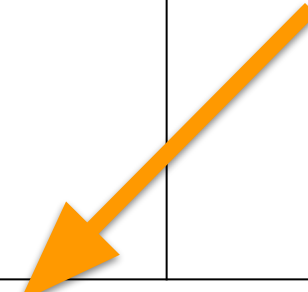
Testing Materials: Practice Template



The background is a solid yellow color. It is decorated with various scientific and mathematical icons. In the top left, there are four pink circles, each containing a white closing parenthesis ')', and a white plus sign '+'. In the top center, there is a small pink plus sign '+'. In the top right, there is a white atomic model with three electrons orbiting a nucleus. On the right side, there is a large, irregular, light-yellow shape with several small yellow dots inside. In the bottom left, there is a pink plus sign '+'. In the bottom center, there is a white molecular structure with a central sphere and three surrounding spheres. In the bottom right, there is a white DNA double helix, a blue 'x' mark, and a cluster of four pink circles, each containing a white closing parenthesis ')'.

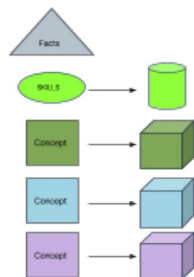
DEEP

Grade 2 Matter

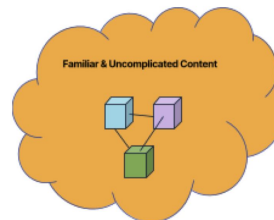
Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.2	Materials are used to make objects. Properties of materials that can be tested include - if light passes through (transparency) if water is absorbed - if the material can be shaped (malleability) - if light is reflected (reflection) Various properties of materials can be measured, including length and weight (mass).	Materials have unique properties. 	Test properties of various materials. Measure various materials using non-standard measurements. 

~ material
~ testable property

~ property
~ measurable property
~ observable property
~ object



~ test
~ measure



How do Material Scientists Test Materials?



Testing Properties of Materials

Source: Science Buddies



What does a Material Scientists do?

Source: Science Buddies

Students put objects and materials into groups based on their observable properties, test materials for strength and absorbency, and use their results to make a boat that can hold the most pennies before sinking.



Lesson 1.1 - Classifying Objects Based on their Observable Properties

Students sort common objects according to characteristics such as shape, flexibility, and the material they are made from to investigate the question: Can you group objects based on their characteristics?



Lesson 1.2 - Testing Materials to Learn About Their Properties

Students conduct a series of tests on different materials to learn about their properties to investigate the question: What are some of the characteristic properties of paper, plastic, and aluminum foil?



Lesson 1.3 - Designing an Absorbency Test

Students plan and conduct an absorbency test on paper, plastic, aluminum foil, and felt to investigate the question: Which material absorbs water and why?



Lesson 1.4 - Using the Properties of Materials to Improve a Model Boat

Students use what they've learned about the properties of paper, plastic, and aluminum foil to investigate the question: Which materials are best for making a boat that can hold the most pennies before sinking?

[Link](#)

Uncovering Chemistry in Everyday Life. ACS



**Who cares - Why
test materials?
(Cardboard chair)**

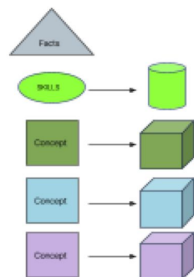


Istockphoto.com#637743724

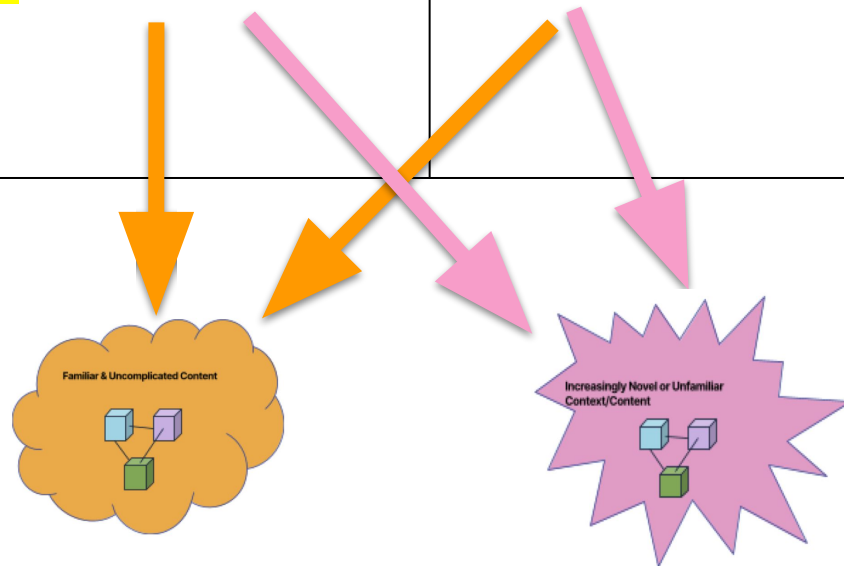
Grade 2 Matter

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.3	Natural materials are those that come from plants, animals, the land, or the sky. Processed materials are made by humans.	Materials are natural or processed. All processed materials originate from natural materials.	Sort various materials as being natural or processed.

~ natural material
~ processed material



~ sort



SURFACE

Concepts and Skills

Matter

(Properties of Materials)

```
graph LR; A((Matter  
(Properties of Materials))) --- B((Types of Materials)); B --- C((Natural)); B --- D((Processed  
(Man Made)))
```

Types of Materials

Natural

Processed
(Man
Made)

Natural vs Man-Made Environment

This video shows students natural and man-made environments and where they find natural and manmade objects within.



**Natural Material
(NOT Man
Made)**

**Processed or
Man Made
Material**

**Walk around the room and
find examples of
Man-Made or Natural
Materials.**



Salt

Glass

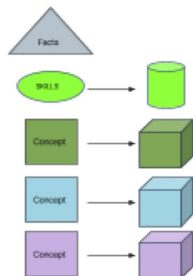
Shells

Grade 2 Matter

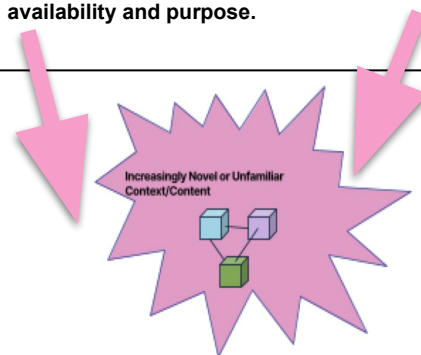
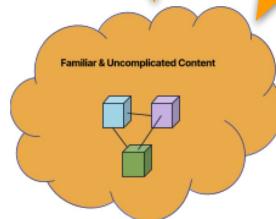
Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.5	Knowledge of the properties of materials and their purposes is important in many occupations and roles, such as - carpenter - engineer - designer Knowledge Keeper or Elder First Nations, Métis, and Inuit use of materials is informed by - traditional knowledge - time of year availability - taking only what is needed - respect for the land	The purpose of an object influences the choice of materials used to produce it. Some materials are more suitable than others for making a product for a specific purpose.	Compare the properties of materials to determine what material is best suited for a specific purpose. Explain the relationship between suitability of materials and purpose. Select a material and use it to create an item for a specific purpose. (These should be combined.) Discuss the choice of material based on availability and purpose.

~ purpose
~ material
~ product

~ suitability



~ compare and contrast
~ explain
~ discuss



Matter

(Properties of Materials)

First Nations,
Métis, and
Inuit Uses of
Materials

Purpose
Influences
Choice

Suitability,
availability and
sustainability

Concept

Purpose

Purpose: Concept Attainment



Concept/Skill

Similarity &
Difference
Compare &
Contrast



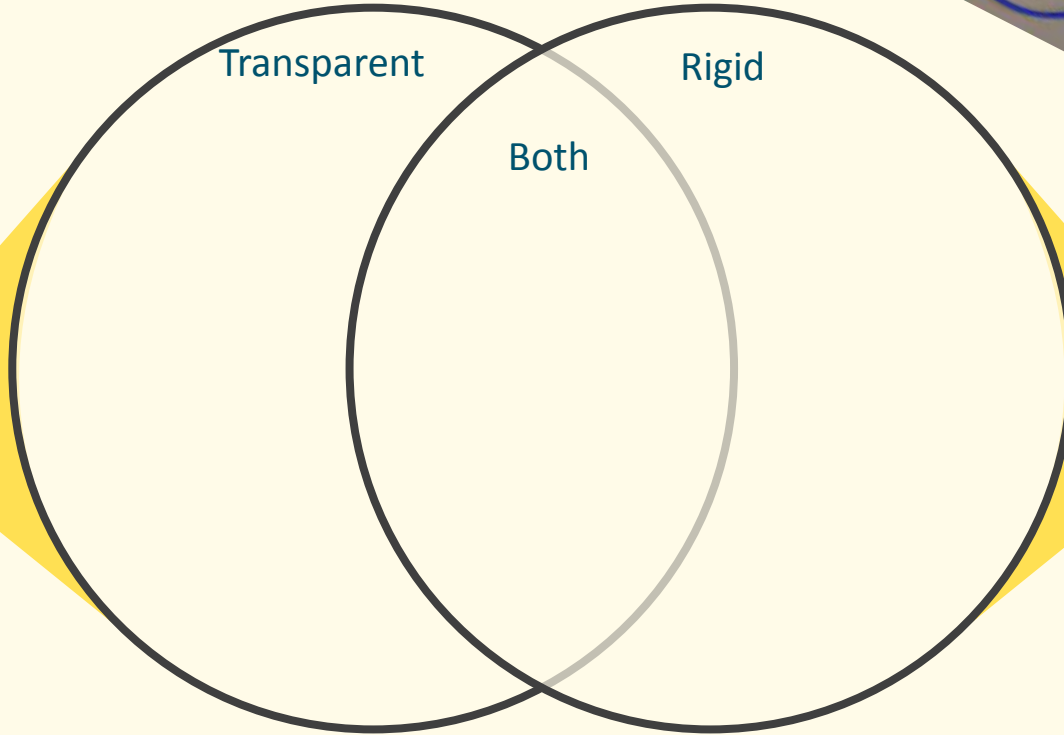
Similarity & Difference: Concept Attainment (Primary K-2)

Compare and Contrast: Venn Diagram

DEEP



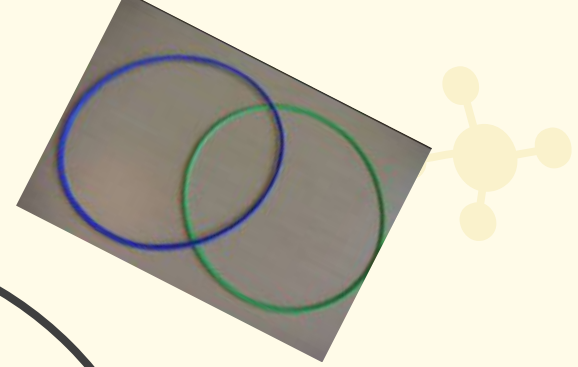
Place the Cards into the Venn Diagram. Be prepared to explain why you placed them in their spots!



Centre Suggestion:

Create varied cards or have varied objects, materials etc with different categories in the Venn Diagrams placed at different centres throughout the room. Could become Transfer Assessment.

Cards for Venn Diagram



Concept

DISCUSSION



What is an DISCUSSION

Sample Discussion Checklist (Div. I)

Discussion Formats

- Gallery Walk
- Think-Pair-Share
- I Used to Think
- Spectrum Sort
- Panel Discussion
- Four Corners

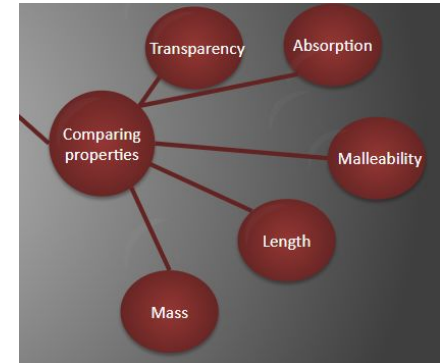
Why? Want a metal shirt?

Why is the handle on an umbrella hard materials and the top plastic?

Would you like plastic reading glasses?

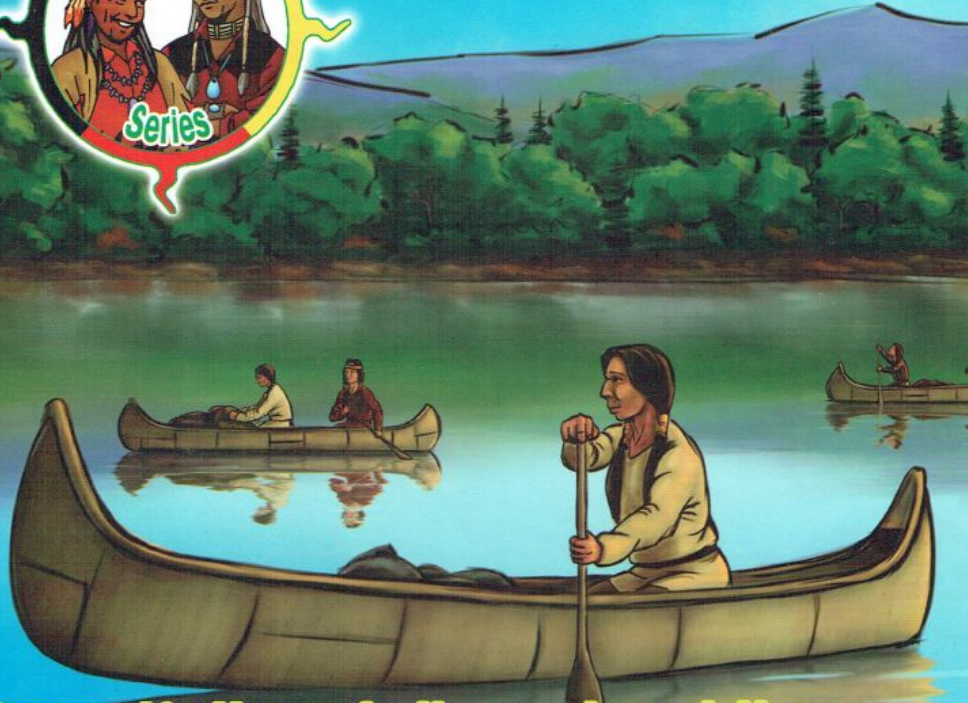
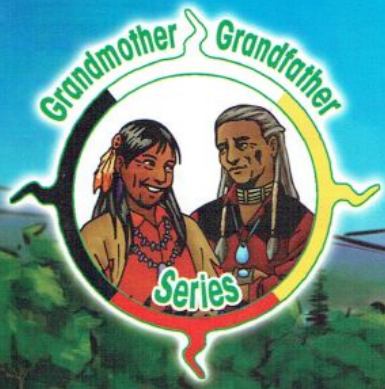


**Addressing:
Purpose and
Property**



Read the story of the [Three Little Pigs](#)

The [TRUE Story](#) of the 3 Little Pigs Fractured Fairy Tales (Read Aloud for kids) Also links materials to building towers.



Grandfather, tell us about the
birch bark canoe.

Birch Bark Biting



Denise Lajimodiere

BIRCH BARK BITING
BELCOURT, NORTH DAKOTA

Making Birch Bark Soap

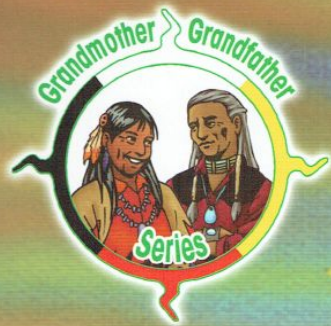


MASKWIO'MI

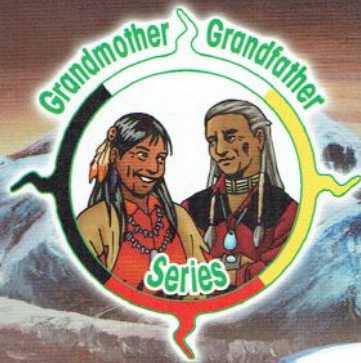
making birch bark soap

Birch Bark Syrup





Grandfather, tell us about the
inukshuk.



Grandfather, tell us about the
igloo.

The Buffalo

Tanned Hide

Backrests
Bags
Beds
Belts
Blankets
Bridles
Caps
Cradles
Doll Mittens
Dresses
Leggings
Moccasin Tops
Pillows
Pouches
Ropes
Shirts
Sweat lodge
Cover
Tapestries
Tipi Liners
Tipi Covers
Winter Robes

Hair

Bracelets
Braided Ropes
Doll Stuffing
Hair Pieces
Headdresses
Horse Halters
Medicine Balls
Moccasin Lining
Ornaments
Pad Fillers
Pillow Fillers

Meat

Immediate use
Dried
Meat/Jerky
Pemmican
Sausages

Tail

Decorations
Fly Swatter
Knife Sheaths
Medicine
Switch
Whips

Dung

Diaper Powder
Fuel

Hoof Sheath

Containers
Glue
Rattles
Spoons
Wind Chimes

Stomach Contents

Medicines
Paints

Dew Claws

Glue
Rattles
Wind Chimes

Bladder

Food Pouches
Medicine Bags
Water Container

Gall

Yellow Paint

Tendons & Muscles

Arrow Ties
Bowstrings
Cinches
Sinew

Liver

Food
Tanning Agent

Brains

Food
Hide Preparation

Skull

Altar
Dehaining Tool
Sun Dance

Blood

Paints
Puddings
Soups

Beard

Ornaments

Tongue

Choice Meat
Comb
(Rough Side)

Teeth

Ornaments

Fat

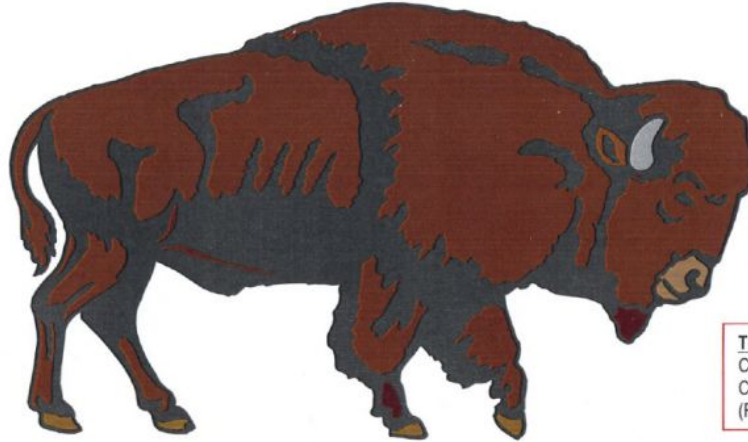
Soaps
Tallow
Tanning
Hair Grease
Filled Pipe Sealer
Cosmetic Aids

Horns

Arrow Points
Cups
Fire Carrier
Headdresses
Ladles
Medication
Ornaments
Powderhorn
Signals
Spoons
Toys

Bones

Arrowheads
Awls
Eating utensils
Fleshing Tools
Game Dice
Jewelry
Knives
Painting tools
Pipes
Quirts
Saddle Trees
Scrapers
Shovels
Sleds
Splints
Toys
War Clubs



Scrotum

Containers
Rattles

Stomach Liner

Cooking Vessels
Water Container

Foot Bones

Teething Toys
Toy Buffalo or Horse

Rawhide

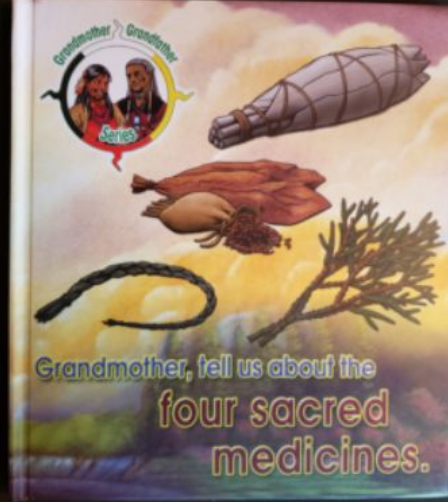
"Par fleche"	Horse-water Trough	Buckets
Masks	Moccasin Soles	Caps
Cinches	Containers	Drums
Ornaments	Quivers	Rafts
Rattles	Ropes	Saddles
Sheaths	Shields	Shrouds
Snowshoes	Splints	Straps
Trunks	Lariats	

Natural World

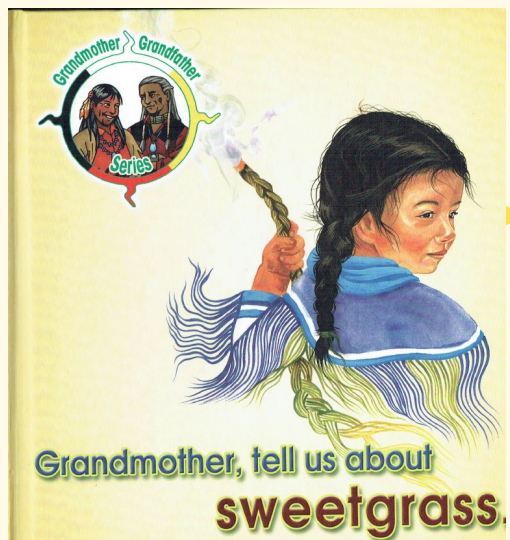
Source: Traditional uses of the [Buffalo](#)



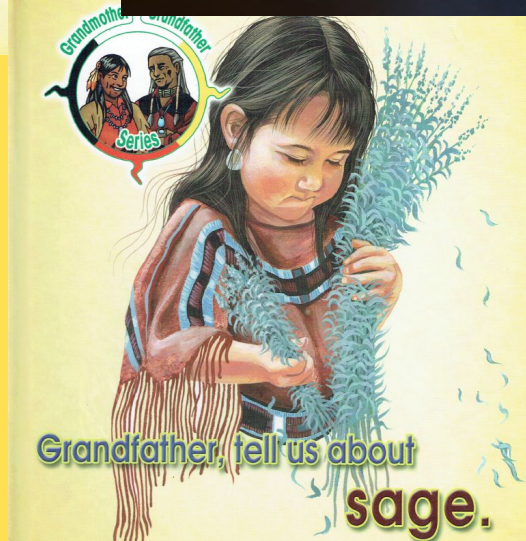
Grandmother, tell us about
cedar.



Grandmother, tell us about the
**four sacred
medicines.**



Grandmother, tell us about
sweetgrass.



Grandfather, tell us about
sage.



Grandfather, tell us about
traditional tobacco.

First Nations Peoples In Canada

Land and Resources -

this resource is a summary of what natural resources First Nations used for living off the land.

Using Natural Products

- Buffalo
- Seal
- Snow
- Natural Wood
(canoes, Red River carts)

The background is a solid yellow color. It is decorated with various scientific and mathematical icons. In the top left, there are four pink circles, each containing a white closing parenthesis ')', and a white plus sign '+'. In the top center, there is a small pink plus sign '+'. In the top right, there is a white atomic model with three electrons orbiting a nucleus. On the right side, there is a large, irregular, light-yellow shape with several small yellow dots inside. In the bottom left, there is a pink plus sign '+'. In the bottom center, there is a white molecular structure with a central sphere and three surrounding spheres. In the bottom right, there is a white DNA double helix, a blue 'x' mark, and a cluster of four pink circles, each containing a white closing parenthesis ')'.

DEEP

The Skills and Procedure statement for Understanding 2M1.5 can be used to for a Deep Activity.

Task: Select a material and use it to create an item for a specific purpose.

Explain the relationship between the purpose of the item and the suitability of the material used.

Grade 2 Matter

Organizing Idea	Matter: Understandings of the physical world are deepened by investigating matter and energy.		
Guiding Question	How can properties of an object be distinguished from one another?		
Learning Outcome	Children examine properties of objects.		
	Knowledge	Understanding	Skill
2M1.4	An object can be made from different materials; e.g., a canoe can be made from wood or aluminium. Examples of objects made from natural materials that are created and used by First Nations, Métis, and Inuit are • Dene birchbark baskets • travois • Red River carts • canoes • Inuit scraping tools; e.g., ulu	Natural and processed materials are used to make objects that serve a variety of purposes.	Identify natural and processed materials that could be used for a specific purpose. (Investigate?) Identify an object that can be made from different materials. Identify natural materials used by local First Nations, Métis, or Inuit and relate the materials' uses to specific purposes.

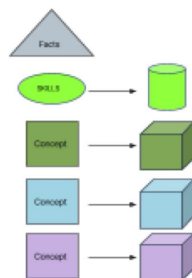
~ purpose

~ object

~ material

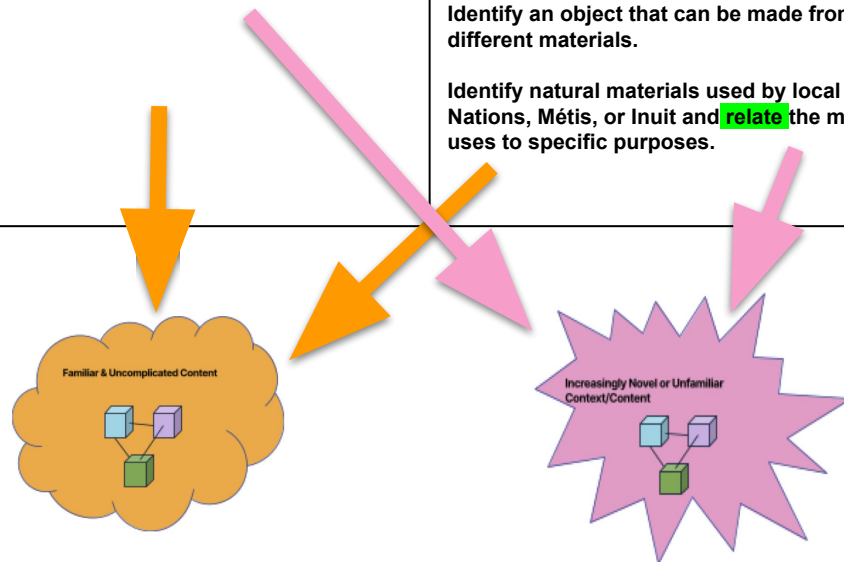
~ processed material

~ natural material



~ investigate?

~ relate



Surface

Concept

Purpose

Relationship: Concept Attainment



The background is a solid yellow color. It is decorated with various scientific and mathematical icons. In the top left, there are four pink circles, each containing a white closing parenthesis ')', and a white plus sign '+'. In the top center, there is a small pink plus sign '+'. In the top right, there is a white atomic model with three electrons orbiting a nucleus. On the right side, there is a large, irregular white shape with many small yellow dots inside. In the bottom left, there is a pink plus sign '+'. In the bottom center, there is a white molecular structure with a central sphere and three surrounding spheres. In the bottom right, there is a white DNA double helix, a blue 'x' mark, and a cluster of four pink circles, each containing a white closing parenthesis ')'.

DEEP



Metis [Culture](#)



Red River Cart Fact Sheet

Dimensions of the box (rectangular prism)

Length of box: 2.0 m

Width: 0.5 m

Height: 1.7 m

How much can the cart hold?

Capacity 225 kg if horse drawn

Capacity 450 kg if oxen drawn

Speed of Travel

Horse drawn: 80 km per day

Oxen drawn: 20 km per day

Taking furs to the

trading post

Weight of dried

beaver pelts:

60 pelts = 45 kg



2017 Ford Supercab XLT Truck Facts

Cargo Box Dimensions:

L = 2.0 m

W = 1.7 m

H = 0.5 m

Maximum Cargo: 1347 kg

Highway travel speed: 100 km per hour

Inuit Tools and Survival - Living off the land

All that is precious to us
The Region of Nunavik



Avataq Cultural Institute, Avataq Cultural Institute has three
complementary collections, Nunavimmiut (The Land)

Transfer & Assessment

●● Consideration 1

TRIANGULATION

Formative assessments that triangulate can be used at each level of surface, deep, and transfer.

- Observations
- Conversations
- Products

Transfer Activities can be summative assessments.

Consideration 2

Skills and procedures “are what students do to demonstrate knowledge and understanding.”

(Guiding Framework)



Materials and properties worksheets

[Link](#)

Observing, classifying and using materials

Observing and understanding the properties of materials is fundamental to science. These worksheets encourage students to think about **familiar materials** in a more **systematic** way.

Observable Properties

Examine materials directly with our senses.



Materials with Common Properties

Grouping materials with common properties.



Sorting Properties with Venn Diagrams

Using Venn diagrams to sort materials based on two properties.



Material Properties and Uses

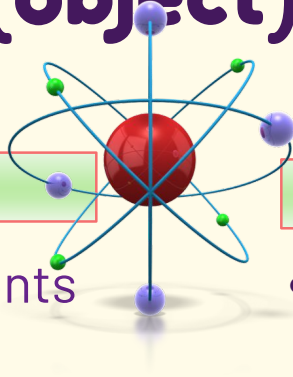
Linking a material's properties to its uses.



What is your favorite activity, hobby or item (object)?

I like skiing!

Case Study



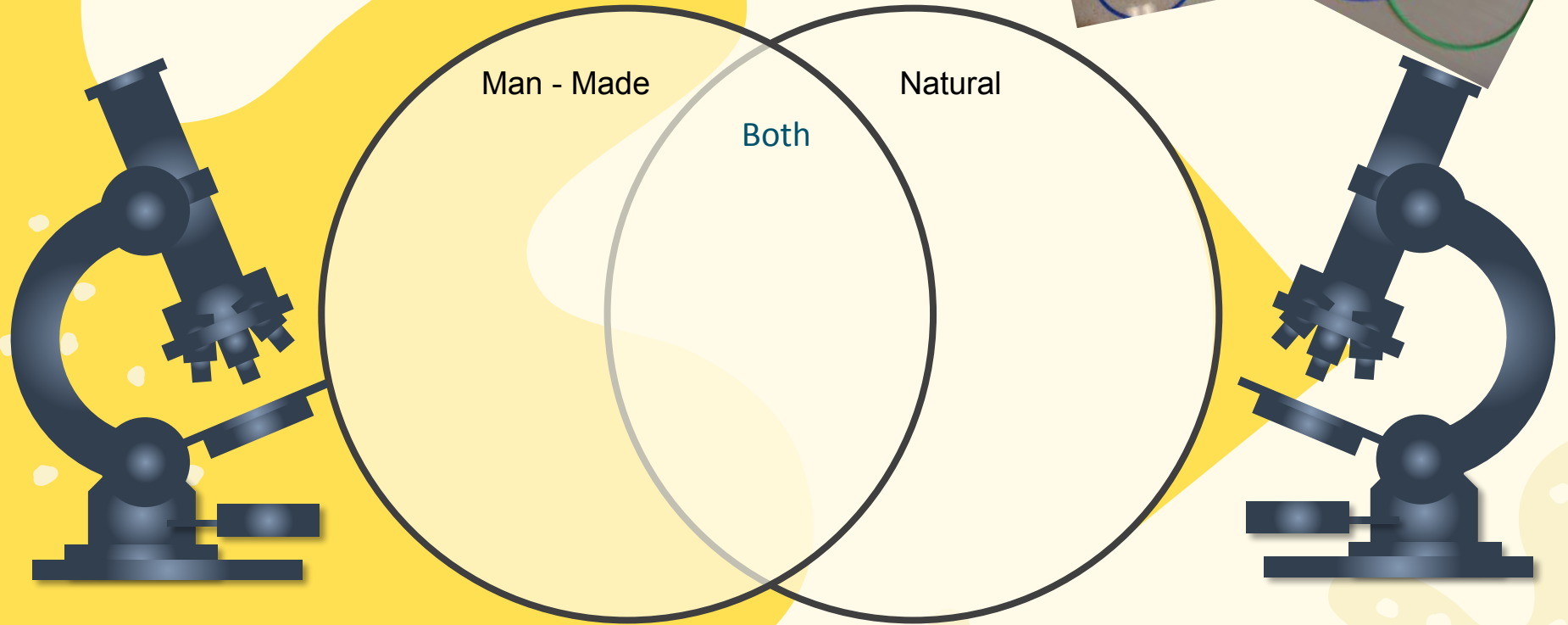
What is your FAV?

- Find an object that most students would not know that can be discussed as a class.
 - What is it used for?
 - What is it made of?
 - Is it possible that it could be made out of other materials as well? If so, what?
- What else do we know about your item?



Science: Compare and Contrast

Digging Deeper



An transfer or assessment activity can include multiple understandings.

*Choose an item you want to create. What is its purpose? (To hold something
What amount of something? To make something move? To have something to
To stop something from happening? To make someone happy? To make a*

*the item using only **natural materials** you find on our walk to? Then the same
ing **processed materials**. Be able to explain which object you like better, and why
materials you chose were **suitable** for the item's **purpose**.*

RESOURCES



Possible Extensions

Building Vocabulary

Touch Book – sandpaper, felt, shiny paper, fun fur, wool, wax paper,

Feelie Bag – variety of objects, describe it and pull it out. Further describe it.

Shoebox of items – blindfold and describe the objects properties through touch. Remove the blindfold, describe with new words for sight.

(Deep/Transfer) *Bring a toy or object from home that can be described using all 5 senses* – correct vocabulary.

(Deep/Transfer) *Go outside as a class and have each students find one object that can be described using all 5 senses.*



WHAT A SCIENTIST SEES

Dona Herweck Rice

Scientific Method

Before going any further, it's important that you understand something. You need to know the process every good scientist uses when **conducting** experiments. Scientists follow the

scientific method to help them do this method in a way that isn't much purposeful or random. And re

In case you know And if you do know course will be g

Scientific Process

observation
and
research

8

ex

hypot

Tell It!

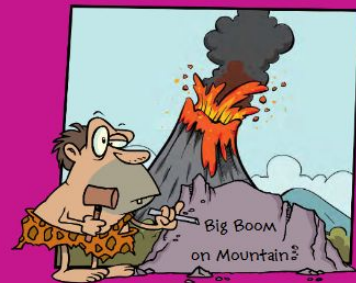
So, now that you've observed, hypothesized, predicted, and tested, what do you, oh scientist, do now? You've got to tell others what you've learned, what you've done, and what the evidence bears out. You could, of course, just keep it to yourself. But where's the fun in that? A scientist wants to know ...and a *good* scientist knows that everyone benefits when information is shared.

It's like this: the understanding of science builds on itself. What one scientist learns becomes the basis for another scientist's investigations. And those investigations support other scientists. The work grows and grows. More is learned, validated, or even disputed. There's always more to discover and uncover. There's always more to know!

Scientists take measurements of a solar furnace.

The basic scientific method can be listed in six simple steps: observation and research, **hypothesis**, **prediction**, experimentation, analysis, and report.

Scientists have worked like a team. The work of scientists from the early days has come forward to today. Today's work will be the future. Scientists come and go. What



Long-Term Learning

Learning *why* something happens can take time. Some experiments take hundreds of years to complete! A *longitudinal* (lon-jī-TOOD-n-l) study is one that takes place over long periods of time. Researchers observe the same variables many times, looking for what stays the same and what changes.

88

Sort It!



Dona Herweck Rice

Sort it by look.



Sort it by smell.

Sort it by taste.





Anne Montgomery



One is **rough**.



One is **smooth**.

8

Descriptive and Comparative Language

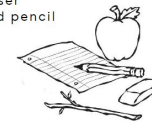
Suggested activity
- tied to sample senses

Let's Do Science!

How can you describe things like a scientist? Try this!

What to Get

- ☐ 3 things you can hold and look at, such as an apple, a twig, or an eraser
- ☐ paper and pencil



18

What to Do

- 1 Make a chart like this one. Write the names of the three things you chose.

Item	Sight	Touch
Apple		
Twig		
Eraser		

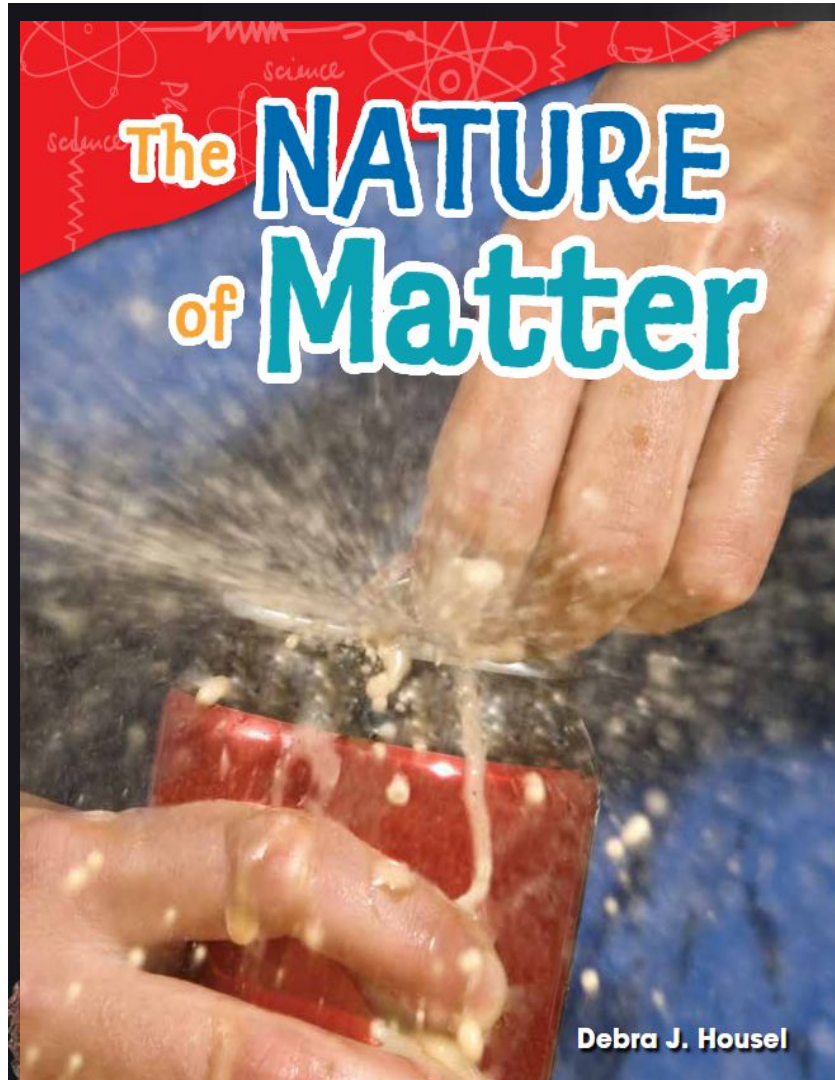
- 2 Hold each thing, one at a time. Write how it looks under . Write how it feels under .



- 3 Describe how the things are the same. Describe how they are different.



19

The book cover features a red top section with the title 'The Nature of Matter' in large, stylized letters. Below the title is a photograph of hands pouring a yellow liquid from a red container, with a blue background showing a splash. The author's name 'Debra J. Housel' is at the bottom. The right side of the cover has a vertical strip with images of a snowy mountain and a fire.

The Nature of Matter

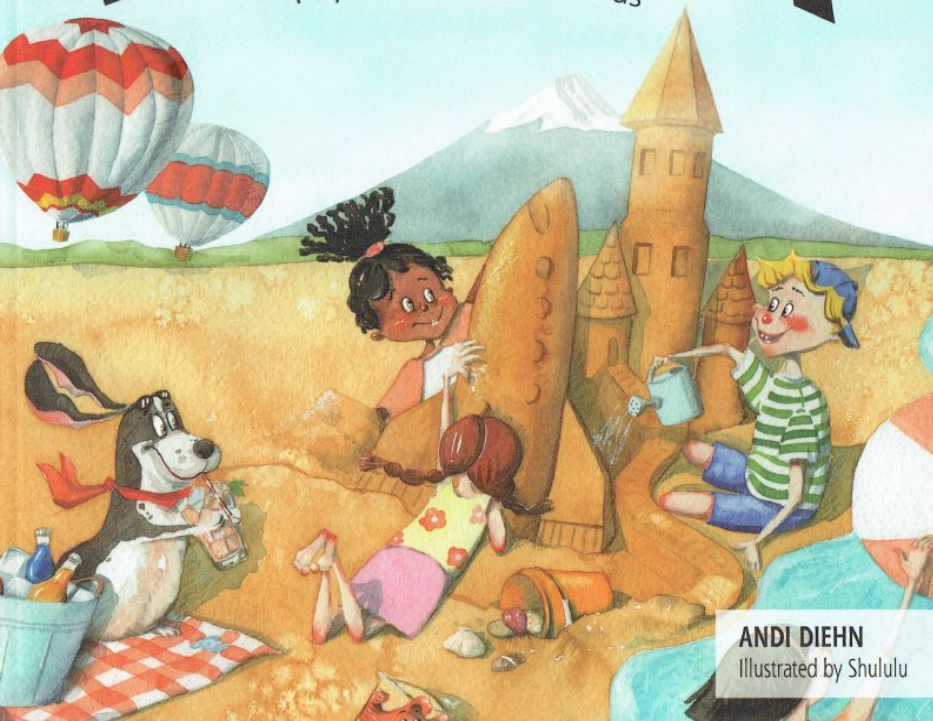
Debra J. Housel

Table of Contents

Matter Is All Around You.	4
Solids Are Matter.	6
Liquids Are Matter.	14
Gases Are Matter.	20
States of Matter.	26
Let's Do Science!.	28
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Your Turn!.	32

MATTER

physical Science for Kids



ANDI DIEHN
Illustrated by Shululu



Matter can be a **solid**, **liquid**, or **gas**.

Do you have ice cubes in your freezer?
What happens when you leave an
ice cube on your kitchen counter?

It melts into a puddle of water!
And if you leave that puddle
of water on the counter
(unless your mom makes
you clean it up!), it . . .

DISAPPEARS!

Can you name 15 things that
are made of matter—five solids,
five liquids, and five gases?

TRY THIS!





Additional Resources



Chemistry Made Simple - properties of matter slideshow (additional slide deck)

Greta Dromgoal. University of Waikato,NZ. <https://www.sciencelearn.org.nz/>

Faculty of Education

The University of Waikato Te Whare Wananga o Waikato

Private Bag 3105

Hamilton 3240

New Zealand

ACS Chemistry For Life

Educational Resources - Inquiry in Action

Chapter 1 - Properties of Materials

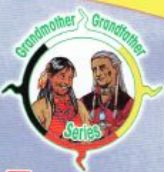
Students put objects and materials into groups based on their observable properties, test materials for strength and absorbency, and use their results to make a boat that can hold the most pennies before sinking.

This section contains 4 lessons.

<https://www.acs.org/content/acs/en/education/resources/k-8/inquiryinaction/second-grade.html>

GRANDMOTHER AND GRANDFATHER

Teacher's Guide



Set 2

NATIVE REFLECTIONS

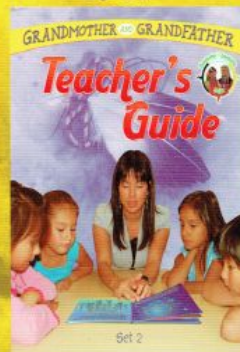
is happy to offer our
**CLASSROOM
GUIDES**

This Comprehensive
Teacher's Guide includes:

Lesson plans with background
information, teaching suggestions for
all subject areas, ELA strategies for
building, reading and comprehension
skills, activities and blackline masters.

CG-02

BKS-08



Set 2



www.nativerellections.com

Sources and Resources

Biskup, Agnieszka. *States of Matter* with MaxAxiom. Graphic Library. Minnesota: Capstone Publishing

- SPARK Library - Pearson Publishing. 2009

- Diehn, Andi. *Matter - Physical Science for Kids*. Vermont: Nomad Press. 2018

Small Books from Pearson Publishing - *Spark Library*

Analyze It. Author :

Solid or Liquid very basic intro solid or liquid

Sort It - Author: Donna Rice

Tell me About It - Author: Anne Montgomery

What a Scientist Sees - Author: Donna Rice (Scientific Method)

Teacher Note: There is an option to apply for free access for 30 days to the library

If teachers are interested in Spark, they can register for a 30-day free trial at

[pearsoncanada.ca/spark](https://www.pearsoncanada.ca/spark)

Computing Science and Grade 2 Matter

Link to [recording](#) (12 min)

Link to [slide deck](#) for Computer Science

Computer Science

Kindergarten	Grade 1	Grade 2	Grade 3
Recognize when actions do not correspond to instructions.	Determine if instructions with two or three steps given in different orders still produce the desired outcome.	Predict the outcome of instructions that have three to four steps.	
		Debug any errors in a set of instructions to achieve a desired outcome.	
		Refine instructions to more efficiently achieve a desired outcome.	
		Test instructions with three to four steps to verify that a desired outcome is achieved.	
Match an action to the corresponding instruction.			
Engage in activities that involve following instructions in various contexts.		NOTE: The statements are colour-coded to reflect similar types of skills or thinking involved.	
Engage in activities that involve following instructions presented in various ways.	Follow instructions during investigations.		
Follow a sequence of two steps related to a learning experience.	Follow instructions with two or three steps given in different forms.		
Communicate a sequence of two steps for a given purpose.	Sequence two or three instruction steps to achieve a desired outcome.	Create three-step to four-step instructions that achieve a desired outcome.	Create a set of instructions.
	Exchange ideas for creating three-step instructions that achieve a desired outcome.	Exchange ideas to design clear three- to four-step instructions, including repetition, to achieve a desired outcome.	Collaborate to write two different sets of instructions that achieve the same outcome.
		Work individually or in groups to create instructions using precise words, pictures, or diagrams.	
			Create something new by combining, changing, or reapplying existing ideas.

SCIENTIFIC METHODS

Video links will be coming to connect Grade 2 Mater with the Scientific Method.

Scientific Methods

Investigation Process Grade 1	Grade 1	Investigation Process Grade 2 & UP	Grade 2	Grade 3
<i>Steps followed during an investigation include</i> - asking questions - making predictions - gathering data - forming conclusions	Ask a question sparked by curiosity.	<i>Procedures scientists use to guide investigations include</i> - asking questions - making predictions - planning the investigation - observing and recording data - analyzing data reaching conclusions - discussing observations and conclusions	Explore various purposes for conducting an investigation.	Develop new questions for further investigations.
	Predict the answer to a question.		Develop questions for the purpose of an investigation.	
	Make observations using various senses.		Determine if observations relate to the purpose of the investigation.	Collect data using techniques to improve the accuracy of data.
	Record observations as data.		Collaborate to combine recorded data into a single list or chart.	Compare the trustworthiness of sources of data
	Reflect on recorded data (analyze) to make conclusions.		Compare observations and data with others.	Analyze data collected during investigations.
				Reflect on how conducting an investigation contributes to building knowledge.
				Compare the trustworthiness of sources of data
	Demonstrate safety and respect during investigations.	NOTE: The statements are colour-coded to reflect matches to steps in the investigation process.		



THANKS!

Do you have any questions?

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