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Curriculum Planning & Assessment Resource

Mathematics Kindergarten

Alberta Regional Professional Development Consortia

Dedicated to the provision of professional learning opportunities at the local, regional and provincial levels

Curriculum Planning & Assessment Resource
Mathematics
Kindergarten Measurement 1

About This Document

This Curriculum Planning & Assessment Resource is intended to be a collection of sample activities, assessments, and resources that teachers may wish to use as they develop their unit plans. This document is not intended to be a sequential list of activities. Rather, the intent is that teachers choose from this resource what is appropriate for their context, and sequence it in their planning.

The sample activities, assessments and resources included in this document have undergone an initial review to determine appropriateness and alignment to the curriculum. However, it is expected that teachers use their professional judgement in selecting activities, assessments and resources that are appropriate for their context.

While every attempt has been made to provide credit and receive permissions, some errors or omissions may have occurred. Please contact info@arpdc.ab.ca to report any error or omissions.

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Important Links

New Learn Alberta Progressions
- Competency Progressions
- Numeracy Progressions
- Literacy Progressions

Recorded Video:
- How to Read these Curriculum Planning & Assessment Resources

Planners and Concept Maps
- K-3 Math Planners
- 4-6 Math Planners (under development)
- Assessment Planners (under development)
- K-3 Math Action Verbs and 4-6 Math Verb Resources

Curriculum Progressions
- Skills and Procedures Progression K-3 (under development)
- Concept Progressions (under development)

Interactive Numbered Outcomes Document with Skills

Acknowledgements

Thank you to all the teachers, numeracy specialists, and technical expertise from Alberta school divisions and ARPDC who collaborated to develop, review, and revise these planning and assessment documents to support curriculum implementation.

Kindergarten Measurement 1

Organizing Idea

Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.

Guiding Question

In what ways can size be distinguished?

Learning Outcome

KM1 Children explore size through direct comparison.

Summative Assessment(s) - Transfer *(In Progress)*

Summative assessments can include the following.

- *Understanding/making sense of a novel context from the real world using one or more concepts (eg. “How are place value and money related?).*
- *Understanding/making sense of a novel context using one or more understandings (eg.Students use money to model the conversion of base 10 values and relate them to base 10 block’).*
- *Being able to describe* why *(linking concepts) something is true, a result, or what might be an extension using learned concepts and understandings.*
- *Apply learning (create products; undertake projects; taking action such as creating a campaign) in a novel context or taking action using the understanding(s).*
- *Construct arguments by taking a position and verifying/proving it with known understandings.*

Summative Assessment(s)

[*understanding surface vs deep vs transfer*]

KM1 Summative Assessment (EN) **KM1 Summative Assessment (FR)**

Click to jump!

KUSP KM1.1	KUSP KM1.2

Literature Connections

KUSP KM1.1

Assumable Curriculum / Prerequisite Knowledge / Vocabulary

Student Language | Essential vocabulary & concepts

- **Attribute**: characteristics of a set of items that allow the items to be sorted
  - Examples: measure, length, area, capacity, weight
- **Measure:** to determine the size, amount, degree or something, using standard or non-standard units
- **Length:** the measure from end to end
- **Area:** how much flat space an object covers
- **Capacity**: how much a container holds
- **Weight**: the heaviness of an object

I Know Statements | Metacognition

- I know size can be described as the length of an object
- I know the area is how much flat space an object covers
- I know capacity is how much a container holds
- I know weight is the heaviness of an object

Pre-Assessments

***Nelson Leaps and Bounds* pages will be referenced in the Pre-Assessments to follow up for emerging learners.**

I Can Statements | Skills

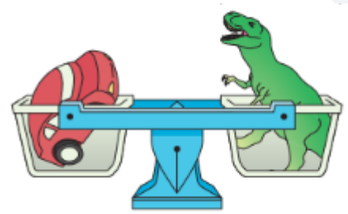
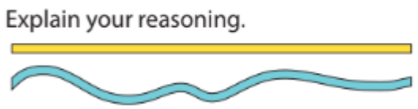
- I can identify the length of an object
- I can identify the area of an object
- I can identify the capacity of an object
- I can identify the weight of an object.

Learning Recovery

Enhancement

-

Learning Outcome	KM1.1 Children explore size through direct comparison.				
Knowledge	**Understanding**	**Skills & Procedures**	**Achievement Indicators**	**Illustrative Examples**	**Formative Assessments**
Size can be interpreted in many ways (according to measurable attributes), such as: • the length of an object • how much flat space an object covers (area) • how much a container holds (capacity) • the heaviness of an object (weight)	Size describes the amount of one measurable attribute of an object or a space.	Identify measurable attributes of familiar objects to which size may refer.	Identify measurable attributes of familiar objects.	**Which attribute can be used to describe the objects?**  **Which attribute can be used to describe the objects?**  **Which attribute can be used to describe the objects?**  **Name a LARGE animal.** **Name a SMALL animal.** **Name something that is LONG.** **Name something that is SHORT.** **Name something that is HEAVY.** **Name something that is LIGHT.** **Which attribute can be used to describe the objects?**	Interview students, using the term attribute, and assess them on being able to name or indicate measurable attributes related to size. KM1.1 Measurable Attributes - **Deep**

			Identify objects that have length, height, area, capacity, or mass.	Outdoor Measurement Activity: Part 1 Students gather different items or materials outside (dandelions, sticks, rocks, etc), and then use these as measuring tools to show the different lengths and widths of various items. - Use this activity to talk about different items, practising measurement vocabulary. They could also tell you what attribute they may use to compare them by.	
				 **Which attribute is being shown in the image above?** **Which attribute can be used to describe the objects below?**  www.ncetm.org.uk/masterypd **Area:** Students use Pattern Blocks to develop the concept of area by counting the number of blocks it takes to cover a given shape. Examples of Pattern Block mats to print, laminate, and use in your classroom can be found HERE. 	

Resources

Mathology

ARPDC Math Little Books for Alberta Curriculum
Mathology Free Resources on New Learn Alberta

Mathology Little Book: To Be Long
Mathology Little Book: The Best in Show

Math UP

Kindergarten - Comparing Measurements Directly

Existing Texts

Nelson: ***My MathPath Kindergarten Provocations***
Measurement

- **Compare Objects by length, width and height:** Cards #1 - 3
- **Compare, Estimate, Measure length, width, heighth using non-standards units**: Cards# 4 - 7
- **Compare and Estimate Mass:** Cards # 1-2
- **Compare, Estimate, Measure capacity using non-standards units:** Cards # 1-3

NCETM (teacher guides and resources)

NCETM: Year 1 Measurement: Activities
Select from Set A or B

Additional Websites/Resources

Solids and Shapes Around Us - contains some comparative work for students in capacity, weight and length.
The Teacher's Guide provides all teaching strategies and resources. The students guide is extensive but download only the pages you would like students to work on.
Teachers Guide
Student Workbook
Source: Core Knowledge - Home Page

Gizmos (Teacher Login Required)

New Learn Alberta: ***no match for Kindergarten***
For access to additional resources, request a Gizmos account alberta@explorelearning.com

Indigenous Lesson Plans and Resources

Metis and Inuit Games/Activities: Kneel Jump Game (Traditional Inuit Game)
Measuring length (distance)

Problem Solving

Stacking Challenge: “Can You Stack It?” - see illustration for ideas.
Students will measure, count, sort, question, problem solve, and play.

Challenge students to select different materials (natural (from outside) and manmade) and stack them.

- stack each material and see which stacks more easily
- describe the stacks using measurement attributes

Students should test the ‘stackability’ of different items and possibly mix the items to see if that allows for a longer or taller or wider stack…

Prompting questions may include: “Why do you think this item stacks more easily?”, “How many of these items do you think you can stack?”, “Which attribute would you use to describe this stack?”, etc.

Adapted from https://kindergartenlearning.ca/problem-solving-innovating

Click to jump!

KUSP KM1.1	KUSP KM1.2

Literature Connections

KUSP KM1.2

Assumable Curriculum / Prerequisite Knowledge / Vocabulary

Student Language | Essential vocabulary & concepts

- **Compare:** To consider the qualities of two or more things or sets, to discover similarities or differences.
- **Order:** to arrange in sequence according to size, or amount
- **Length:** the measure from end to end
- **Area:** the amount of flat space covered by a shape/region
- **Capacity:** how much a container holds
- **Weight:** the heaviness of an object

I Know Statements | Metacognition

- I know when to use the words longer, taller, shorter, heavier, lighter, bigger, smaller, big enough, too big, and too small.
- I know the size of two objects can be compared.
- I know objects are measured for a reason or need

Pre-Assessments

***Nelson Leaps and Bounds* pages will be referenced in the Pre-Assessments to follow up for emerging learners.**

I Can Statements | Skills

- I can compare the length, area, mass, height, or capacity of two objects.
- I can describe the size of an object to another object.
- I can describe a reason or need to measure an object.

Learning Recovery

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Enhancement

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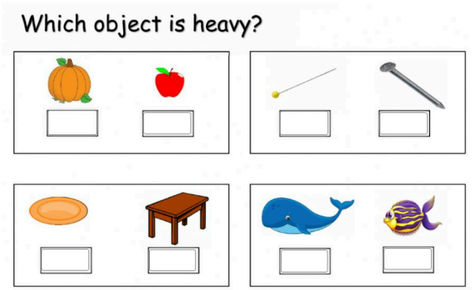
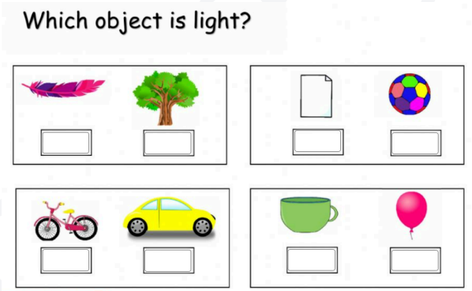
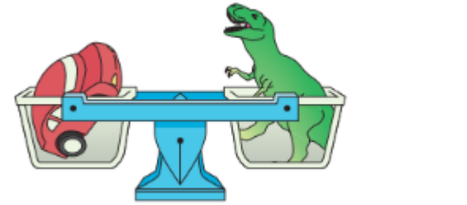
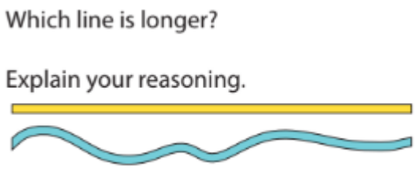
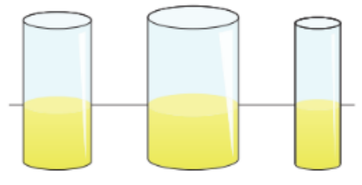
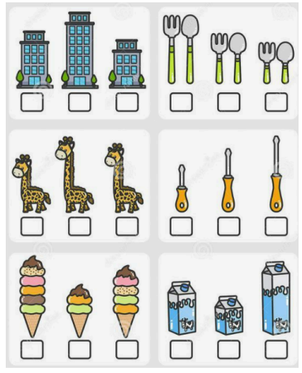
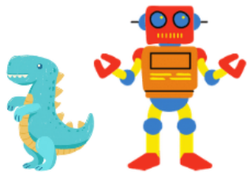
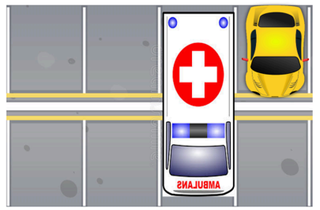
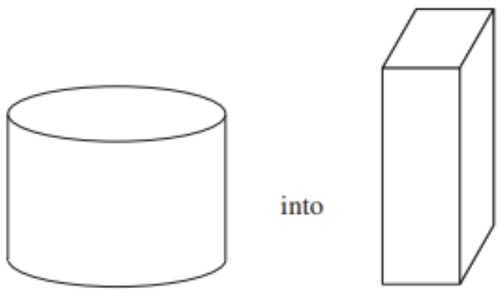
Learning Outcome	KM1.2 Children explore size through direct comparison.				
Knowledge	**Understanding**	**Skills & Procedures**	**Achievement Indicators**	**Illustrative Examples**	**Assessments**
Comparisons of size can be described by using words such as • longer • shorter • heavier • lighter • too big • too small	Size may refer to only one measurable attribute at a time. The size of two objects can be compared directly. The size of an object can be described in relation to a purpose or need.	Compare the length, area, weight, or capacity of two objects directly. KM1.2a	Compare the length (height) of two given objects; and explain the comparison, using the words *shorter*, *longer (taller),* or *almost the same*.	Ask students to find three objects in the classroom that are the same length. Set out three classroom objects Which is the heaviest? Which is the lightest?  **Which object is the longest?**  **Which object is the shortest?** 	[KM1.2a Comparing Weight](#) **- deep** [KM1.2a Balancing Act](#) **- deep** [KM1.2a Whose Bag is Heavier?](#) **- deep**

			Compare the mass (weight) of two given objects; and explain the comparison, using the words *lighter*, *heavier,* or *almost the same*.	  https://www.liveworksheets.com  	

			Compare the volume (capacity) of two given objects; and explain the comparison, using the words *less*, *more*, *bigger*, *smaller,* or *almost the same*.	Which has the greater capacity, the bottle or the jug?  www.ncetm.org.uk/masterypd Captain Conjecture says, 'All of the glasses contain the same quantity of lemonade.' Do you agree?  Explain your reasoning. www.ncetm.org.uk/masterypd	
			Compare the area of two given objects; and explain the comparison, using the words *less*, *more*, *bigger*, *smaller,* or *almost the same*.	 **Label the images using comparison words:** **bigger, smaller, holds the most, holds the least, etc.**	

		Describe the size of an object in relation to another object, using comparative language. KM1.2b		**Students will get two objects to describe using comparative language.** **The robot is taller than the dinosaur.** **The dinosaur is shorter than the robot.**  **The pencil is longer than the crayon.** **The crayon is shorter than the pencil.**	**Surface Level Activities** • **Size Detective:** Play with the whole class or a small group. Materials: overhead projector, objects Directions: Place a pencil on the overhead. Ask students to look for something that is longer/shorter than the pencil. Place their objects on the overhead to compare. Continue with other objects. Ask students to make collections of objects that are similar, shorter, or longer in length. • **Supply craft supplies** so students can make objects of specific lengths, such as, as long as your foot, as short as their thumb, and the same length as this paper. • Ask students to use **unifix cubes to make trains** that are longer than, shorter than, and the same length as a given object. • Provide class with **strips of ribbon and one stick approximately 30 cm long.** Have students sort ribbons into three groups: shorter than, longer than, and the same length as the stick. **Source:** "Kindergarten Mathematics Support Document for Teachers: Manitoba Curriculum" **KM1.2b Biggest and smallest - surface** K5 Learning site: Biggest and Smallest **KM1.2b Big vs Small - surface** K5 Learning site: Big vs small **KM1.2b Long vs Short - surface** K5 Learning site: Long vs short **KM1.2b Tall vs short - surface** K5 Learning site: Tall vs short **KM1.2b Longer_shorter_more_less - deep**

					[KM1.2b Measuring](#) - surface [KM1.2b Under_Cover](#) - surface
		Describe the size of an object in relation to a purpose or need, using comparative language. KM1.2c		 **Parking Lot Problems:** Students will compare the amount of space needed in a parking lot for various-sized vehicles. Which object will fit in the box? 	[KM1.2c Pick a box](#) - deep
				* **Note:** Students may assume that large objects are automatically heavier and small objects lighter. They need to have opportunities to pick up and compare objects of different sizes, shapes, and masses. **Note:** When pouring from one container to another, a student may believe that the second container holds more if the level appears higher, even if they pour the contents back into the first container. Example: This is because the child is not yet conserving the capacity of the container or the volume of the material in it. Students need to be aware of the common usage of the word "full." A full glass of milk is one in which the volume of milk measures less than the capacity of the glass. If a student fills a glass to the brim with milk, he or she is likely to be told that the glass is too full. There are many instances of this anomaly in daily life (e.g., a full bottle of pop, a room full of people, a box full of blocks, etc. [Kindergarten Mathematics Support Document for Teachers: Manitoba Curriculum"](#)	

Resources

Mathology

ARPDC Math Little Books for Alberta Curriculum
Mathology Free Resources on New Learn Alberta

Mathology Little Book: To Be Long
Mathology Little Book: The Best in Show

Math UP

Kindergarten - AB_Comparing Measurements Directly

Nelson My MathPath Kindergarten Provocations

Measurement

- **Compare Objects by length, width and height:** Cards #1 - 3
- **Compare, Estimate, Measure length, width, heighth using non-standards units**:Cards# 4 - 7
- **Compare and Estimate Mass:** Cards # 1-2
- **Compare, Estimate, Measure capacity using non-standards units:** Cards # 1-3

NCETM (teacher guides and resources)

Measurement - Activity A

Websites/Other

Kentucky Intervention Guide KNP - provides great lessons and activities (outcomes based) for Teachers K-3.
For this unit Check Exploring Measurement

Students gather different items or materials outside (dandelions, sticks, rocks, etc), and then use these as measuring tools to show the different lengths and widths of various items.

- Use this activity to talk about different items in relation to measurement.
- **Comparing measurement tools: students can use blocks, rulers, or other items to compare measurement attributes with the natural materials.**

Gizmos (Teacher Login Required)

New Learn Alberta: ***no match for Kindergarten***
For access to additional resources, request a Gizmos account alberta@explorelearning.com

Indigenous Lesson Plans and Resources

Kneel Jump (Comparing Length):
Metis and Inuit Games/Activities: Kneel Jump Game (Traditional Inuit Game)
Measuring length (distance)

- Students will begin at a designated starting point and jump forward from knees to a squatting position (click link for picture examples).
- After one student jumps, mark their spot with a piece of tape with their name on it. When the next student jumps, mark the landing spot and compare it to the reference point. Encourage students to use measurement vocabulary to describe the jumps (Kim's jump was longer than Sam's jump). The longer jump becomes the new reference point. At the end of the game, ask students whose jump was the longest? How do you know?

Problem Solving

Stacking Challenge: **Part 2**
Students will measure, count, sort, question, problem solve, and play.

Challenge students to select different materials (natural (from outside) and manmade) and stack them.

- stack each material and see which stacks more easily
- describe the stacks using measurement attributes

Students should test the 'stackability' of different items and describe it using a measurement attribute.
Next: ask students to design the stack, possibly mixing the items to see if that allows for a longer or taller or wider stack…

Prompting questions may include: "Why do you think this item stacks more easily?", "How many of these items do you think you can stack?", "Which attribute would you use to describe this stack?", **"Compare your stack to this item [teacher item of choice]."**, **"How did you make this stack [longer, taller, wider, …]?",** etc.

Adapted from https://kindergartenlearning.ca/problem-solving-innovating

Click to Jump!

KUSP KM1.1	KUSP KM1.2

Literature Connections

Literature Connections

Title	Author	Format (Picture Book, Novel, Non-fiction, other)	Publisher	ISBN	Notes
Ants Rule: The Long and Short of It	Bob Barner	Picture Book	Holiday House (Feb. 21 2017)	0823436608, 978-0823436606	Comparisons using longer and shorter.
Mighty Maddie	Stuart J. Murphy	Picture Book	HarperCollins; Illustrated edition (Sept. 21 2004)	9780060531614, 978-0060531614	Comparisons using heavy and light.
Super Sand Castle Saturday	Stuart J. Murphy	Picture Book	HarperCollins; Illustrated edition (Jan. 1 1999)	9780064467209, 978-0064467209	Comparisons using longer, shorter, big, small.
Math Counts: Weight	Henry Pluckrose	Picture Book	Children's Press; Illustrated edition (Sept. 1 1995)	0516454609, 978-0516454603	Comparing objects
Size	Henry Pluckrose	Picture Book	Children's Press; Library edition (Aug. 28 2018)	053117512X, 978-0531175125	Exploring size through direct comparisons
How Long?: Wacky Ways to Compare Length	Jessica Gunderson	Picture Book	Picture Window Books; Illustrated edition (Aug. 15 2013)	1479519146, 978-1479519149	Comparing objects
Marta! Big & Small	Jen Arena	Picture Book	Roaring Brook Press (August 23, 2016)	1626722439, 978-1626722439	Comparisons using big and small
Who Sank the Boat?	Pamela Allen	Picture Book	Puffin Books; Reissue edition (April 16 1996)	069811373X, 978-0698113732	Comparing size
Best Bug Parade	Stuart J. Murphy	Picture Book	HarperCollins (March 1 1996)	0007619383, 978-0007619382	Comparisons using big and small
Big and Little	Samantha Berger	Picture Book	Scholastic Incorporated, 2013	0439699371, 9780439699372	Comparisons using big and small