

Curriculum Planning & Assessment Resource

Mathematics Grade 3



**Alberta Regional Professional
Development Consortia**

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Curriculum Planning & Assessment Resource

Mathematics

Grade 3 Statistics 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 judgment 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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Literature Connections	12	Recorded Video: <ul style="list-style-type: none"> • How to Read these Curriculum Planning & Assessment Resources 	Curriculum Progressions <ul style="list-style-type: none"> • 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.

Grade 3 - Statistics 1

Organizing Idea

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Guiding Question

How can representation support communication?

Outcome

3ST1 Students interpret and explain representations of data.

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)

[\[understanding surface vs deep vs transfer\]](#)

[3ST1 Summative Assessment - English](#)

[3ST1 Summative Assessment FRENCH](#)



KUSP 3ST1.1

Prerequisite Knowledge

Students should be able to identify, create and read a pictograph and bar graph. They should know the meaning of data so they can now apply it to specific types of data.

Student Language | Essential vocabulary & concepts

- **Data:** information collected to learn about people or things
- **Statistical question:** a question that can be answered by collecting data
- **Representation:** connects data to a statistical question

I Know Statements | Metacognition

- I know a statistical question can be answered by collecting data.
- I know that collected data can be shown in different ways.

Pre-Assessments

Nelson Pre-Assessments 2: Finding Each Students Pathway

Grade 2:

- Making a Pictograph- P. 55
- Reading a Graph - p. 56
- Making Bar Graphs . 57
- Asking Questions - p. 58
- Reading Graphs - p.59

Grade 3

- Making Bar Graphs - p.39
- Reading Bar Graphs - p.40

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

I Can Statements | Skills

- I can interpret and explain representation of data.
- I can make statistical questions.
- I can predict the answer to a statistical question.

Learning Recovery

- Review how to compare quantities to 100 by using Mathology Little Book: [Marsh Watch](#)

Enhancement

- Have students collect data based on their statistical questions and represent these data using a bar graph, tally marks, a pictograph, dot plot, etc.
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Learning Outcome							
3ST1 Students interpret and explain representations of data.							
Knowledge	Understanding	Skills & Procedures	Achievement Indicators	Illustrative Examples	Assessments (Explainer)		
Statistical questions are questions that can be answered by collecting data.	Representation connects data to a statistical question.	Formulate statistical questions for investigation.	Formulate clear questions with clear response options to collect relevant data.	<p style="text-align: center;">Statistical Questions</p> <p>Definition: A statistical question has answers that will probably vary. Usually a statistical question will ask about a population of multiple people, events or things.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Examples: Statistical Questions</p> <p>What time did the students in this class get up this morning?</p> <p>How many votes did the winning candidate for President of the Student Body receive in each of the past 20 years?</p> <p>What were the high temperatures in all of the Latin American capitals today?</p> </td> <td style="width: 50%; vertical-align: top;"> <p>Examples: NOT Statistical Questions</p> <p>What time did I get up this morning?</p> <p>How many votes did the winning candidate for Student Body receive this year?</p> <p>What was the high temperature in Mexico City today?</p> </td> </tr> </table> <p style="text-align: right;">SCHOOL 21</p> <p style="text-align: center;">Online Math Learning</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">Statistical Questions</p> <p>A question is statistical question if it can be answered with data that vary. The answer is a percent, range, or an average.</p> <p>Example of Statistical Questions</p> <p>What do 7th graders prefer to eat for lunch? What time did the students in this class get up this morning? What is the typical number of pets owned by students in my class?</p> <p>Example of Non-Statistical Questions</p> <p>What did Tom eat for lunch? Did you get up on time this morning? How many brothers does Martha have?</p> </div>	<p>Examples: Statistical Questions</p> <p>What time did the students in this class get up this morning?</p> <p>How many votes did the winning candidate for President of the Student Body receive in each of the past 20 years?</p> <p>What were the high temperatures in all of the Latin American capitals today?</p>	<p>Examples: NOT Statistical Questions</p> <p>What time did I get up this morning?</p> <p>How many votes did the winning candidate for Student Body receive this year?</p> <p>What was the high temperature in Mexico City today?</p>	<p>Students play an Aboriginal game and formulate statistical questions for investigation. Students predict the answer to a statistical question. Students collect data , represent their data and tell a story about the data they have represented</p> <p>3ST1.1 Asking Statistical Questions - Surface</p> <p>3ST1.1 Will the Real Statistical Question Please Stand Up! - Surface</p> <p>3ST1 That's a Good Question - Deep</p> <p>Show What You Know! Statistical Questions Quiz by Math Defined with Mrs. C. (video) - Surface</p>
		<p>Examples: Statistical Questions</p> <p>What time did the students in this class get up this morning?</p> <p>How many votes did the winning candidate for President of the Student Body receive in each of the past 20 years?</p> <p>What were the high temperatures in all of the Latin American capitals today?</p>	<p>Examples: NOT Statistical Questions</p> <p>What time did I get up this morning?</p> <p>How many votes did the winning candidate for Student Body receive this year?</p> <p>What was the high temperature in Mexico City today?</p>				
Predict the answer to a statistical question.	Predict the outcome to a statistical question.	When students have chosen their questions, predict an answer.					

Resources

Mathology

[ARPDC Math Little Books for Alberta Curriculum](#)
[Mathology Free Resources on New Learn Alberta](#)

Mathology Little Books

Mathology Little Book: [Welcome to the Nature Park](#)

Mathology Activities

Mathology Grade 3: Data Unit 1A, Data Management: Activity 3

Links to Other Grades

Mathology Grade 1: Data Cluster 2, Probability and Chance: Activity 7 (Ontario)

Math UP

None for this KUSP.

Existing Texts

No direct correlations until Math 9

NCETM (teacher guides and resources)

[Year 3 Statistics Activity A](#)
[Video - Data Handling](#)

Websites/Other

[Online Math Learning](#) Stats

10.1 Statistical Questions - [CK-12 Learning](#)

[Statistical Questions Video](#) - discusses what makes a good statistical question.

Gizmos (Teacher Login Required)

New Learn Alberta

[Reaction Time 1 \(Graphs and Statistics\)](#)

[Reaction Time 2 \(Graphs and Statistics\)](#)

[Mascot Election \(Pictographs and Bar Graphs\)](#)

ExploreLearning Gizmos Site:

[Graphing Skills](#)

For access to additional resources login to Gizmos account. Request an account alberta@explorellearning.com

Indigenous Lesson Plans and Resources

Students play an Aboriginal game and formulate statistical questions for investigation. Students predict the answer to a statistical question. Students collect data, represent their data and tell a story about the data they have represented

[The Plum Stone Game](#)

Problem Solving

Some possible problems could be obtained from Formative Assessment questions contained in Manitoba Ministry of Education [Support Document for Teachers](#)



KUSP 3ST1.2

Prerequisite Knowledge / Vocabulary

Students should be familiar with the terms statistical question, data, bar graphs, dot plots and how to organize their data.

Student Language | Essential vocabulary & concepts

- **Data:** facts or information collected to learn about people or things
- **Dot plot (line plot):** a line on which data are shown by marking "X"s or dots above the categories or numbers on the line
- **Bar graph:** a graph that uses bars to show data. The bars may be vertical or horizontal
- **First-hand data:** data collected by the person using the data.
- **Second-hand data:** data collected by others

I Know Statements | Metacognition

- I know first-hand data is collected by the person using the data.
- I know second-hand data is collected by other people.
- I know second-hand data is found in newspapers, on websites, in databases, etc.
- I know a representation tells a story about the data.

Pre-Assessments

Nelson Pre-Assessments 3: Finding Each Students Pathway

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

I Can Statements | Skills


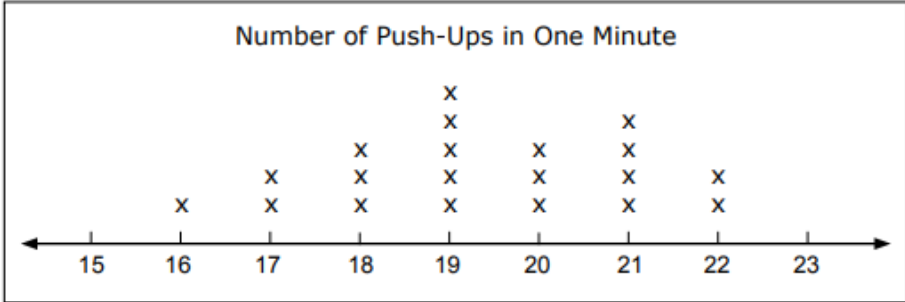
- I can collect and organize data in a dot plot or bar graph using one-to-one correspondence.
- I can construct, label, and interpret a dot plot with one-to-one correspondence.
- I can construct, label, and interpret a bar graph with one-to-one correspondence.
- I can answer a given question and interpret data in relation to a statistical question.
- I can identify and interpret second-hand data in print resources as well as electronic media.
- I can examine and interpret First Nations, Metis, or Inuit representations of data.

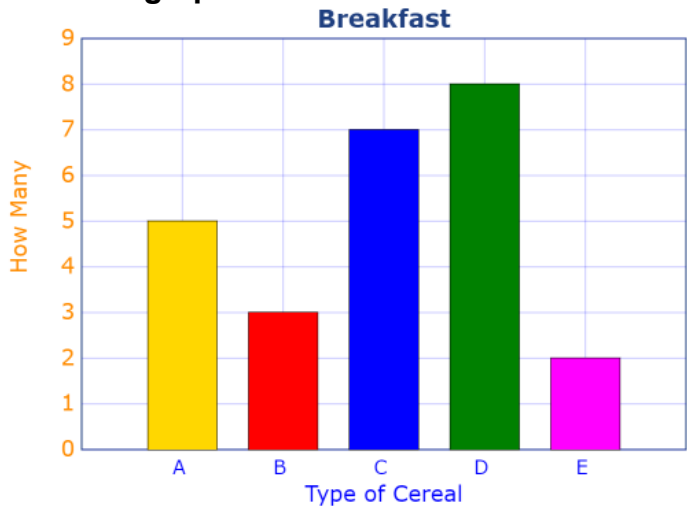

Learning Recovery

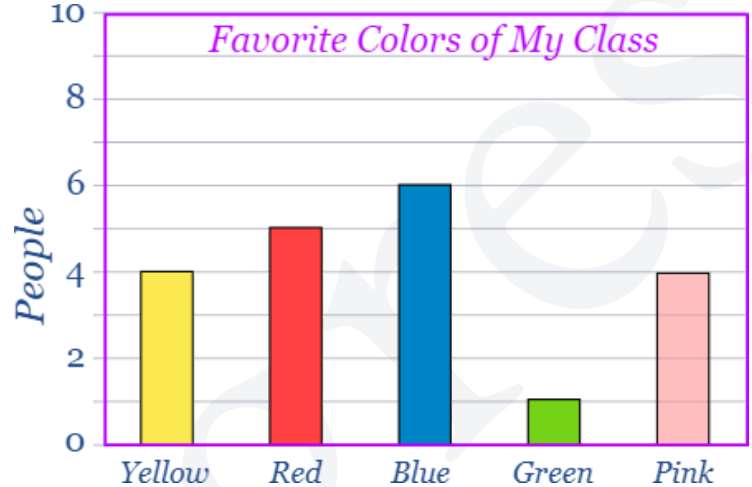
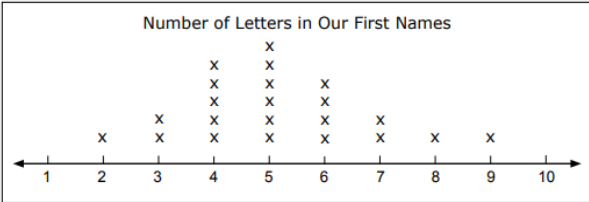
- Provide practice making graphs using Mathology Grade 2: Data Cluster 1, Data Management: [Activity 4](#)
- Provide practice interpreting graphs using Mathology Grade 2: Data Management and Probability Cluster 1, Data Management: [Activity 1](#)

Enhancement

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Learning Outcome		3ST1 Students interpret and explain representations of data.			
Knowledge	Understanding	Skills & Procedures	Achievement Indicators	Illustrative Examples	Assessments (Explainer)
<p>First-hand data is collected by the person using the data.</p> <p>Second-hand data is data collected by others from sources such as websites and social media.</p>	<p>Representation expresses data specific to a unique time and place.</p> <p>Representation tells a story about data.</p>	<p>Collect data using digital or non-digital tools and resources.</p>	<p>Collect data using digital or non-digital tools and resources.</p>	<p>Students can survey classmate and record answers on a paper chart or students can send out a google form to classmates to collect data digitally.</p>	<p>Open assessment.</p> <p>Students will use their question from the “That's a Good Question!” Assessment (or a different one if they prefer) to collect, and represent the data. They should have a predicted answer to their question. They may choose between the dot plot or bar graph.</p> <p>Students may benefit from using the My Data Collection Guide if it is their first time working through a Statistical Inquiry.</p> <p>The Plum Stone Game - Deep - this game allows students an opportunity to write a question, predict and answer, collect first hand information and graph the results.</p> <p>3ST1.2 Make a Dot Plot - Surface/Deep</p>
		<p>Represent first-hand and second-hand data in a dot plot or bar graph with one-to-one correspondence.</p>	<p>Construct, label, and interpret bar graphs to represent data.</p> <p>Collect second-hand data and organize it using one-to-one correspondence. Source</p> <p>Construct, label, and interpret dot plots (line plots) to represent data.</p>	<p>Dot Plots/Line Plots: A number line on which each number in a set of data is plotted by making a mark (usually an X or a large dot) above that number on the number line.</p> <p>Example of a dot plot</p>  <p>Source: Math is Fun</p> <p>Line Plot:</p>  <p>Source: Grade 3 Mathematics:Support Document for Teachers. Ministry of Education: Manitoba. p.8</p>	

				<p>Example of a bar graph</p>  <p>Source: Math is Fun</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="1522 846 1880 1260"> <p>First Hand Data</p> <p>You collect yourself Told by a person who witnessed or was part of an event</p> <p>Example Day / rainfall amount</p> </div> <div data-bbox="1880 846 2222 1260"> <p>Second Hand Data</p> <p>Someone else collects the data Told by someone who knows of the event but was not there</p> <p>Example City / annual rainfall</p> </div> </div>	
		<p>Describe the story that a representation tells about a collection of data in relation to a statistical question.</p>	<p>Describe the story that a representation tells about a collection of data in relation to a statistical question. Find examples of graphs in print and electronic media.</p>	<p>Data Analysis Story</p> 	<p>3ST1.2 What's It Saying To Us? - Deep</p>
		<p>Examine First Nations, Métis, or Inuit representations of data.</p>		<p>Example: explore the significance of the number 4 in first nations (especially Cree) stories related to 4 seasons, 4 directions, medicine wheel, animal/plant/earth/sky, and other cycles.</p>	<ul style="list-style-type: none"> • Apply the example of traplines – hunters go into the bush to assess land and determine where the animals were. • Use the Hunters of Mistassini resource. • Describe bee hibernations and beehive placements: high = lots of snow; and ground level = early spring. • Complete a research project, using the woolly bear

				<p>You may wish to read and discuss the 4 Foundations of the Cree Way of Knowing found at Infusing Indigenous Knowledge</p> <p>You may wish to explore the Lakota Winter Count and how this related to data collection. OR Blackfoot “Winter Count” Buffalo Hide Designs A Faithful Attempt</p>	<p>caterpillar to analyze data related to weather. Source: Infusing Indigenous Knowledge- main website Grade 3 Science</p>
		<p>Consider possible answers to a statistical question based on the data collected.</p>	<p>Describe possible answers to a statistical question using data.</p>	 <p>11 people in the class have the favourite colours blue and red, only 1 person has the favourite colour green.</p>	<p>Students should make inferences based on the data collected and represented. What do their representations show? Tell us? For example, what inferences can we make from the following data?</p>  <p>Source: Grade 3 Mathematics:Support Document for Teachers. Ministry of Education: Manitoba. p.9</p>

Resources

Mathology

[ARPD Math Little Books for Alberta Curriculum](#)
[Mathology Free Resources on New Learn Alberta](#)

Mathology Little Books

Mathology Little Book: [Welcome to the Nature Park](#)

Mathology Activities

Mathology Grade 3: Data Unit 1A, Data Management: Activities 1, 2, 3 (using non-digital resources), 4, 5, 6
 Mathology Grade 3: Data Unit 1B (Ontario), Data Management: Activity 3 (using non-digital resources)

Mathology Interactive Tools

- [Graph Data](#)
- [Create a Graph](#)

Math UP

- **AB_Collecting Data and Graphing**
 - o Lesson 1: Collecting and organizing Data
 - o Lesson 2: Bar Graphs
 - o Lesson 3: Dot Plots
 - o Lesson 4: Interpreting Data Representations

<p>Existing Texts</p> <p>Math Makes Sense Math Makes Sense 3 - Unit 7 Math Makes Sense 4 - Unit 7 Math Makes Sense 5 - Unit 7 - Lesson 1</p> <p>Math Focus Math Focus 3 - Chapter 4 Math Focus 4 - Chapter 4 Math Focus 5 - Chapter 4 Lessons 2 & 3</p>	<p>NCETM (teacher guides and resources)</p> <p>Year 3 Statistics Activity A Video - Data Handling</p>
<p>Websites/Other</p> <p>First and Second Hand Data - with Examples</p>	<p>Gizmos (Teacher Login Required) New Learn Alberta: Reaction Time 1 (Graphs and Statistics) Reaction Time 2 (Graphs and Statistics) Mascot Election (Pictographs and Bar Graphs)</p> <p>ExploreLearning Gizmos Site: Graphing Skills</p> <p>For access to additional resources login to Gizmos account. Request an account alberta@explorellearning.com</p>
<p>Indigenous Lesson Plans and Resources</p> <p>Aboriginal Math Connections - David Sufrin from Indigenous Math Resources, the University of British Columbia EDU Kits - provide educators with 10 lesson plans, numerous biofacts, and specialized equipment (such as microscopes and binoculars) to give you the confidence and tools to facilitate experiential learning at your own pace, without breaking the budget!</p>	<p>Problem Solving</p> <p>Some possible problems could be obtained from Formative Assessment questions contained in Manitoba Ministry of Education Support Document for Teachers</p>



Literature Connections

Title	Author	Format (Picture Book, Novel, Non-fiction, other)	Publisher	ISBN	Notes
The Great Graph Contest	Loreen Leedy	Picture Book	Holiday House; Illustrated edition (Sept. 1 2006)	0823420299, 978-0823420292	Various types of graphs and opportunities to read and interpret data. ***one small speech bubble involves an alligator asking “does this bathing suit make me look fat?”, when reading to class leave this statement out.
Making Graphs (Math World)	Bridget Heos	Picture Book	Riverstream Pub (August 1, 2015)	1622432355, 978-1622432356	Formulating questions, making graphs, interpreting data,
Sir Cumference and the Off-the-Charts Dessert	Cindy Neuschwander	Picture Book	Charlesbridge (August 1, 2013)	1570911983, 978-1570911989	Pie charts, bar graphs, collecting data to make graphs