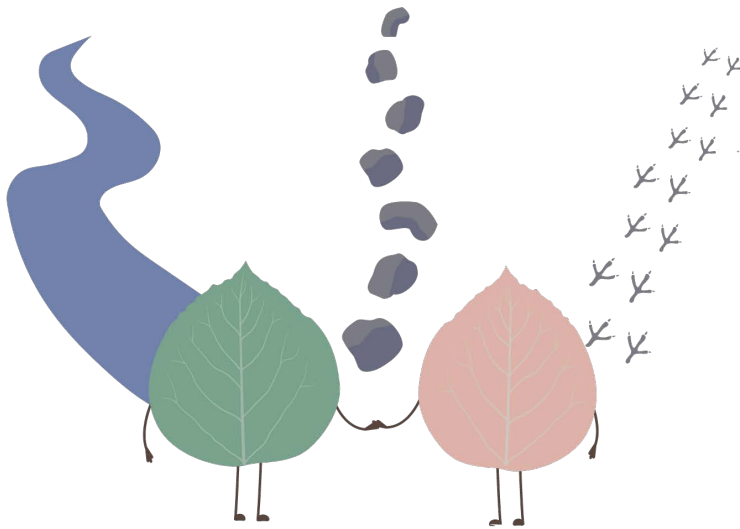


# INVESTIGATE

K - 3

To use a process of inquiry or exploration to gain deeper understanding.



*Investigating* requires students to use mathematical knowledge and reasoning to complete a series of tasks connected to the content.

*Investigating* is a process in which students have multiple opportunities over time to explore different approaches or strategies. Through *investigation* students will be able to draw new conclusions and gain a more thorough understanding of a math concept or idea.

The table below shows where **investigate** is included as student action within Alberta's K-3 Math curriculum.

Grade Level	Learning Outcomes	Skills & Procedures
<b>Kindergarten</b>	Children <b>investigate</b> quantity to 10. Children <b>investigate</b> shape.	<b>Investigate</b> three-dimensional shapes by rolling, stacking, or sliding.
<b>Grade 1</b>	Students <b>investigate</b> and represent data.	<b>Investigate</b> symmetry of two-dimensional shapes by folding and matching. <b>Investigate</b> cycles found in nature that inform First Nations, Métis, or Inuit practices. <b>Investigate</b> equal and unequal quantities, including using a balance model. <b>Investigate</b> addition and subtraction strategies.
<b>Grade 2</b>	Students <b>investigate</b> addition and subtraction within 100.	<b>Investigate</b> strategies for addition and subtraction of two-digit numbers. <b>Investigate</b> translation, rotation, and reflection of two- and three-dimensional shapes. <b>Investigate</b> patterns in a hundreds chart. <b>Investigate</b> First Nations, Metis, or Inuit use of the land in estimations of length.

# INVESTIGATE

To carry out a formal inquiry or a sustained open-ended exploration in order to uncover facts and draw new conclusions about data and information.

Grade Level	Learning Outcomes	Skills & Procedures
Grade 3	<p><b>Investigate</b> multiplication by 0.</p> <p><b>Investigate</b> multiplication and division strategies.</p> <p><b>Investigate</b> the relationships between the sides of a polygon, including perpendicular, parallel, and equal, using referents for <math>90^\circ</math> or by measuring.</p> <p><b>Investigate</b> the relationships between vertices of a polygon, including equal or right angles, using direct comparison or referents for <math>90^\circ</math>.</p> <p><b>Investigate</b> relationships between seconds, minutes, and hours using an analog clock.</p>	

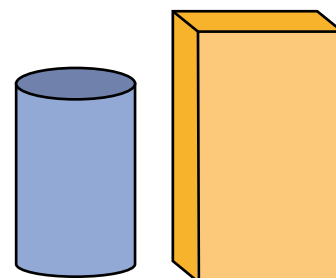


To best support learners, student action verbs should be explicitly taught, modeled and practiced through multiple experiences. The illustrative examples can provide clarification about how student understanding might be developed. It is important to reference the curriculum to view the entire context of the Learning Outcome and related KUSPS.

## Illustrative Examples

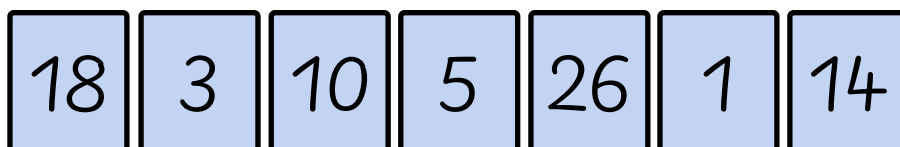
### Learning Outcome KG1.1: Children *investigate* shape.

In small groups, students find a basket with 3-D shapes (cubes, cylinders) on a table. Students *investigate* which shapes can roll, stack and slide. Have the students share which shape(s) can roll, which ones can stack and which ones can slide. To extend thinking, ask the student to tell which attribute a shape must have in order to roll, stack and/or slide.



### Learning Outcome 2N2.2: Students *investigate* addition and subtraction within 100.

Explain the following scenario to your students, showing these number cards on the board or screen:



Choose 2 or more of these number cards to equal 29. Students will investigate addition and subtraction strategies to find sums or differences that equal 29. Which strategy did they find the most useful?

Possible responses might be:  $14 + 10 + 5$  or  $26 + 3$  or  $18 + 14 - 3$  or  $1 + 18 + 10$

Note: This activity would initially be introduced to students using cards with smaller amounts. This could be repeated with different cards and solution amounts. To modify this activity for certain students: fewer cards to choose from, solution with only a single step (i.e.  $20 - 10$ ) or using only one type of operation (such as using only addition).

To best support learners, student action verbs should be explicitly taught, modeled and practiced through multiple experiences. The illustrative examples can provide clarification about how student understanding might be developed. It is important to reference the curriculum to view the entire context of the Learning Outcome and related KUSPS.

### Additional Resources

[Mathematics Investigations Teaching Resources.](#)

[Queensland Curriculum & Assessment Authority Glossary of cognitive verbs.](#)

[Mathematics for Teaching: What are Mathematical Investigations?](#)

### References

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