

BIG IDEAS

Data should be gathered and organized with care in order to answer questions.

Data can be analyzed using a variety of methods.

Statistical knowledge is used when working with data to find reliable results.

Conclusions can be represented graphically and numerically to communicate and inform.

Learning Standards

| Curricular Competencies | Content |
|---|---|
| <p><i>Students are expected to be able to do the following:</i></p> <p>Reasoning and analyzing</p> <ul style="list-style-type: none"> • Use reasoning and logic to analyze and apply mathematical ideas • Estimate reasonably • Demonstrate fluent and flexible thinking of number • Use tools or technology to analyze relationships and test conjectures • Model mathematics in contextualized experiences <p>Understanding and solving</p> <ul style="list-style-type: none"> • Develop, demonstrate, and apply conceptual understanding of mathematical ideas • Visualize to explore and illustrate mathematical concepts and relationships • Apply flexible strategies to solve problems in both abstract and contextualized situations • Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures <p>Communicating and representing</p> <ul style="list-style-type: none"> • Communicate mathematical thinking in many ways • Use mathematical vocabulary and language to contribute to mathematical discussions • Represent mathematical ideas in a variety of ways • Explain and justify mathematical ideas | <p><i>Students are expected to know the following:</i></p> <ul style="list-style-type: none"> • graphical representations for data • statistical analysis of data and relationships between data, including standard deviation and the normal distribution, Z-scores, confidence intervals, and correlation co-efficient • sampling techniques and bias • formulating hypotheses from data sets • statistical techniques to test the validity of hypotheses • analyze and make statistical conclusions • mathematics as a tool when conducting research |

Learning Standards (continued)

| Curricular Competencies | Content |
|--|---------|
| <p>Connecting and reflecting</p> <ul style="list-style-type: none"> • Reflect on mathematical thinking • Use mathematics to support personal choices • Connect mathematical concepts to each other and to other areas and personal interests • Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts | |

DRAFT

Curricular Competencies – Elaborations

reasoning and logic:

- inductive and deductive reasoning
- predicting, generalizing, drawing conclusions through experiences including puzzles, games, and coding

Estimate:

- being able to defend the reasonableness of an estimate across mathematical contexts

fluent and flexible thinking:

- includes using known facts and benchmarks; partitioning; applying whole number strategies to rational numbers and algebraic expressions

Model:

- using concrete materials and dynamic interactive technology

conceptual understanding:

- developed through playing with ideas, inquiry, and problem solving

Visualize:

- includes dynamic visualizations such as graphical relationships, simulations

flexible strategies:

- from a repertoire of strategies, choosing an appropriate strategy to solve problems (e.g., guess and check, model, solve a simpler problem, use a chart, use diagrams, role-play)

experiences:

- includes context, strategies and approaches, language across cultures

many ways:

- including oral, written, visual, use of technology

discussions:

- developing a mathematical community in the classroom through discourse — partner talks, small-group discussions, teacher-student conferences

Represent:

- concretely, pictorially, symbolically, including using models, tables, graphs, words, numbers, symbols

Reflect:

- sharing the mathematical thinking of self and others, including evaluating strategies and solutions, extending, posing new problems and questions

other areas and personal interests:

- to develop a sense of how mathematics helps us understand ourselves and the world around us (e.g., daily activities, local and traditional practices, the environment, popular media and news events, social justice, cross-curricular integration)

Curricular Competencies – Elaborations

Incorporate:

- Collaborate with local First Peoples Elders and knowledge keepers.

make connections:

- Bishop’s cultural practices: counting, measuring, locating, designing, playing, explaining (http://www.csus.edu/indiv/o/oreyd/ACP.htm_files/abishop.htm)
- www.aboriginaleducation.ca
- *Teaching Mathematics in a First Nations Context*, FNEC (<http://www.fnesc.ca/resources/math-first-peoples/>)

Content – Elaborations

graphical representations:

- data types, box and whisker plots, quartiles, outliers, skewed and symmetric data, scatter plots, infographics

standard deviation:

- understand the meaning and the application of standard deviation

correlation co-efficient:

- understand the meaning and application of the correlation co-efficient

sampling techniques:

- simple random, stratified, convenience

hypotheses:

- State H_0 and H_a for determining null and alternative hypotheses.

statistical techniques:

- one-sample and two-sample tests, common test statistics (Z, t, chi squared, and F), one- and two-tail Z and t tests, ANOVA tests

analyze:

- using degrees of freedom, p-values, type I and II error, and level of significance