

Planning for the New Math 6 - Session 5

April 18, 2024 - Provincial

Facilitator: Chris Zarski

Land Acknowledgment

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.

The Stories We Tell by Aguenus (Angela Hall) Source: youcubed- [Indigenous Mathematical Art](#)



Wrapping Up Grade 6

Algebra

6A1.1 / 6A1.2 Review (in sessions 3 and 4) & 6A1.3 - simplifying expressions on both sides of an equal sign to solve equations.

Patterns

6P1 - functions - dependent and independent variables.

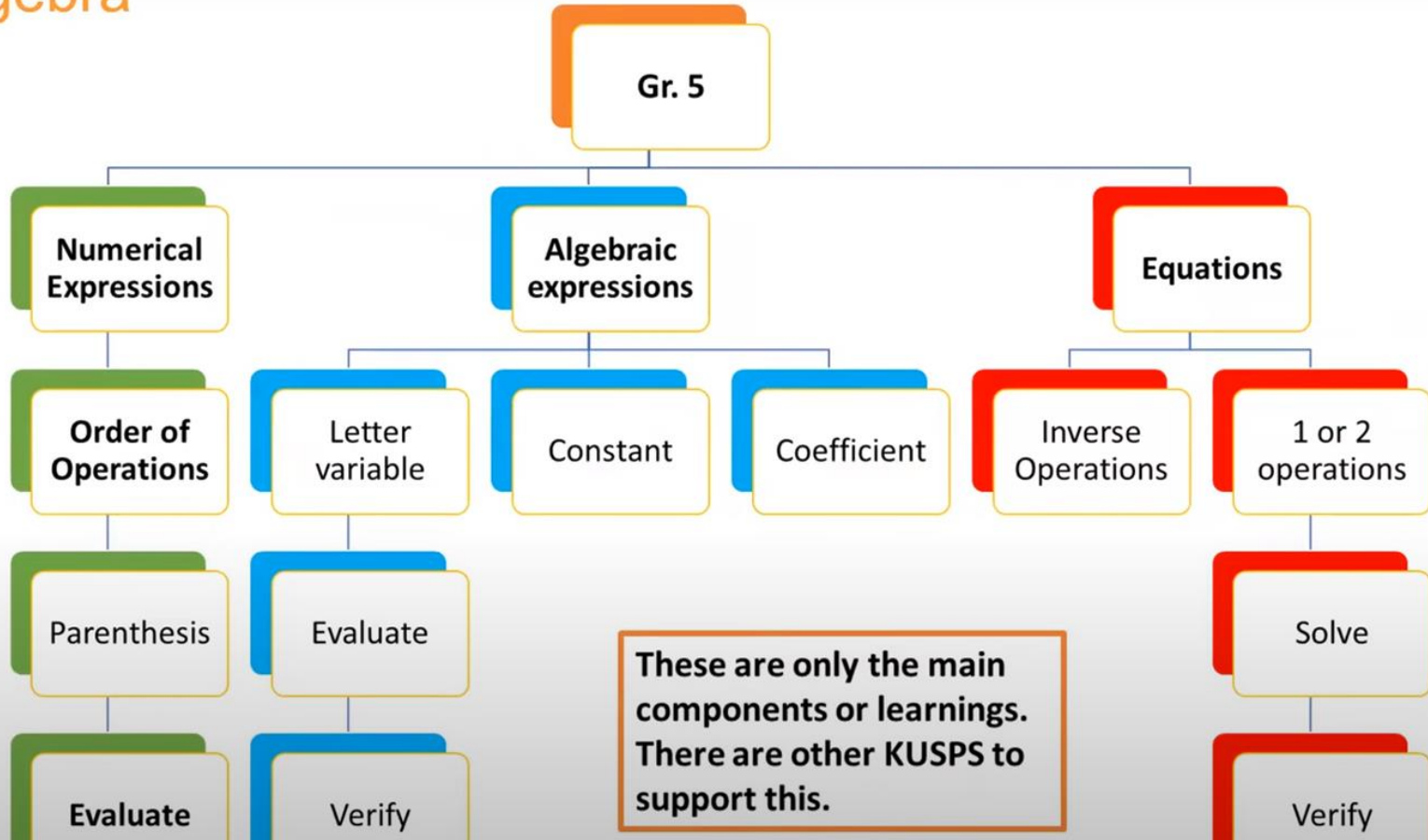
Statistics

6ST1.1 - relative frequency : what is it? & 6A1.2 - how do I apply relative frequency.

Algebra

The background is a solid dark blue. It features several decorative elements: a circular border of triangles in shades of purple and teal at the top; faint white line-art geometric shapes, including triangles and polygons, scattered across the lower half; and a cluster of overlapping white line-art triangles in the bottom right corner.

Algebra



Grade 3	Grade 4	Grade 5	Grade 6
Knowledge of basic fact 10×10	Order of operations (no parenthesis) $\times, \div, +, -$	Evaluate numerical expressions with multiple operations (with addition and subtraction in parenthesis)	Evaluate numerical expressions using order of operations and powers
Equality between a number and an expression 7 has the same value as $4 + 3$ $7 = 4 + 3$	Create numerical expressions with multiple operations $3 \times 6 + 2$	Work with algebraic expressions with a variable, constant, and coefficient $3n + 2$	Understand and apply algebraic properties:
Equality between 2 expressions of the same number $3 + 3 = 4 + 2$	Evaluate numerical expressions with multiple operations $5 + 4 - 3$	Evaluate algebraic expressions of form $x + 6, 2x, x/2, 2x + 6$ when given the value of the variable	Simplify algebraic expressions by combining like terms $2x + 3x$
Equations can have unknown values that can be represented by symbols $5 - \bigcirc = 2$	Understand and apply preservation of equality in an equation without an unknown value (hands on) $7 = 7 \rightarrow 7 + 2 = 6 + 3$	Using inverse operations to solve an equation, limited to 1 or 2 operations	Solve equations with algebraic expressions on both sides of the equations. limited to 1 or 2 operations
Determine an unknown value of an equation (Using <u>manips</u> , balance, reasoning)	Solve an equation with an unknown value, limited to one operation $7 + ? = 13$	Verify solutions to equations through evaluation	Verify solutions to equations through evaluation

How can expressions support a generalized interpretation of number?

6A1.1 Students analyze expressions and solve algebraic equations.

Knowledge	Understanding	Skills & Procedures
<p>Numerical expressions can include powers.</p> <p>The conventional order of operations includes performing operations in parentheses, followed by evaluating powers before other operations.</p>	<p>The conventional order of operations can be applied to simplify or evaluate expressions.</p>	<p>Evaluate numerical expressions involving operations in parentheses and powers according to the order of operations.</p>

Understanding that order makes difference is more important than simply providing an acronym to memorize!

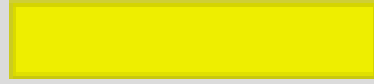
"Why does there have to be an order to solving numerical and algebraic expressions?"

Common Misconceptions

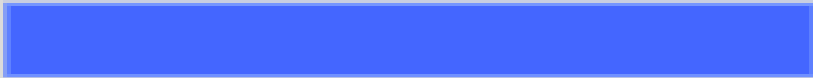
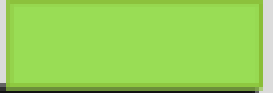
Many students learn the order of operations using PEMDAS (Parentheses, Exponents, Multiplication, Division...) as a memory aid. This very often leads to the misconception that multiplication comes before division and that addition comes before subtraction. Understanding the principle is probably the best memory aid. (Source: [Elementary Math at EDC](#))



+



+





10

+

+



5

+

+



2



6

+

+



1

+

+



7 - 3



2 x 9

+

+



6

What might be the numerical expression that expresses the value for each of the examples below?



What might be the numerical expression for each of the examples below?



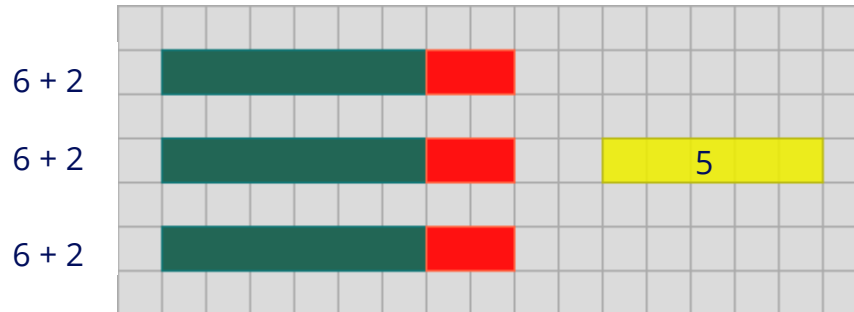
$$2 + 4 \times 5 \quad (\text{all cents})$$



$$4 \times 1 + 3 \times 2 \quad (\text{all dollars})$$

Grade 5

Making the Order of Operations *Visible* helps students to see what *operations* are being completed.



What numerical expression can be written to find the value of the above representation?

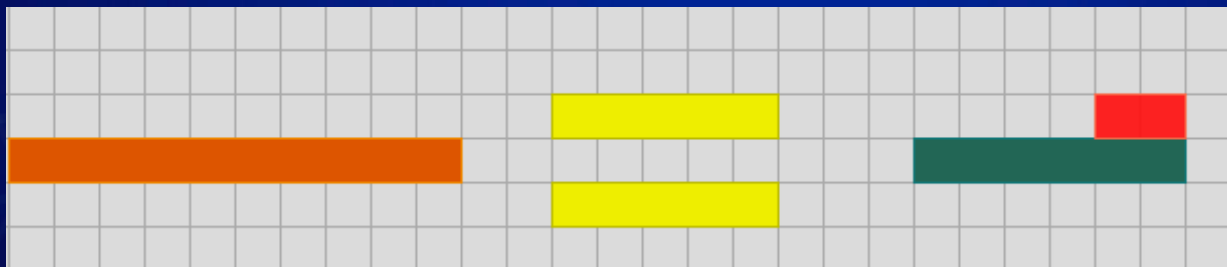
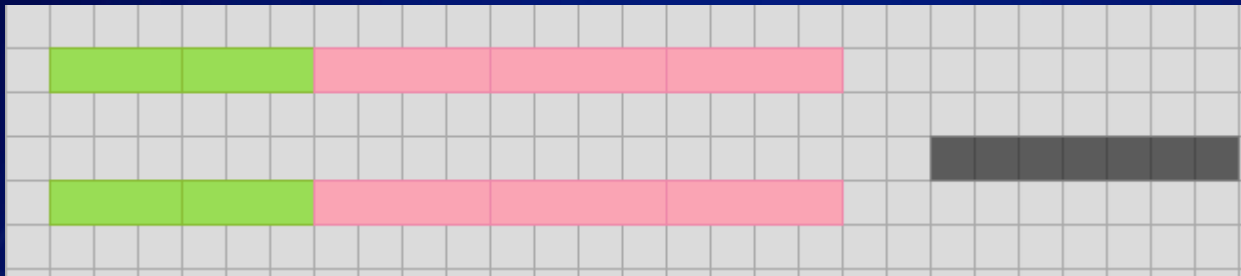
$$3(6 + 2) + 5$$

OR

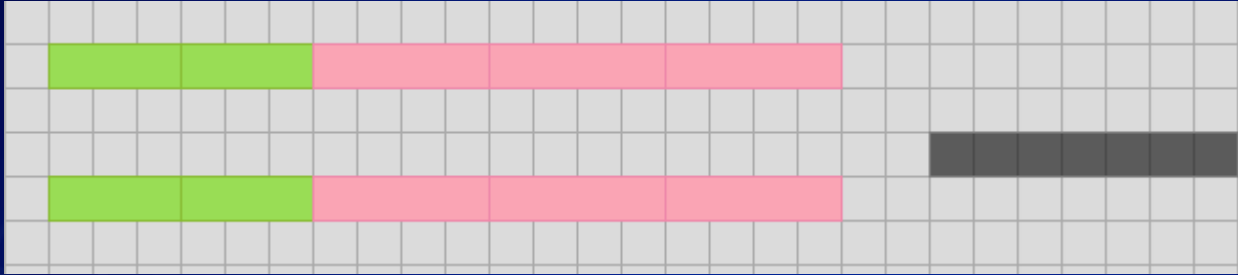
$$3 \times 6 + 3 \times 2 + 5$$

Both ways acknowledge the three colours.

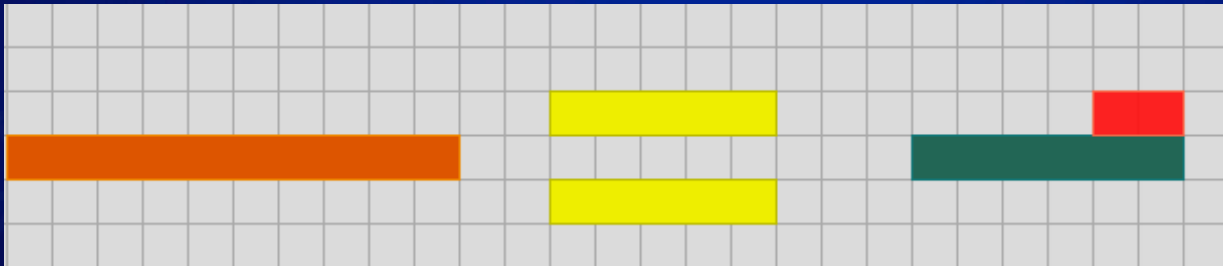
Write an expression for each example below. Find the value of the expression.



Write an expression for each example below. Find the value of the expression.



$$2 \times 2 \times 3 + 2 \times 3 \times 4 + 7 \quad \text{or} \quad 2(2 \times 3) + 2(3 \times 4) + 7$$



$$10 + (2 \times 5) + (6 - 2) \quad \text{or} \quad 10 + 2 \times 5 + (6 - 2)$$

Possible questions:

Example:

Evaluate the expression.

- $(6 - 4) \div 2$
- $12 \div 3 \times (2 + 5)$
- $245 \times 15 + 115 \div 5$
- $\frac{3}{7} + \left(\frac{6}{7} - \frac{2}{7}\right)$
- $0.566 - (0.127 + 0.238)$

(ARPDC created)

Use brackets to make each number sentence true.

- | | |
|---------------------------------|------------------------------------|
| a) $2 \times 3 + 6 = 18$ | b) $20 \times 15 - 2 = 260$ |
| c) $5 + 4 \div 3 = 3$ | d) $12 + 10 \div 11 = 2$ |
| e) $6 + 8 \div 2 = 10$ | f) $5 \times 4 \div 2 = 10$ |

(Math Makes Sense 6 Practice and Homework Book, Pearson Publishing, p.27)

5A1.2 Expression with an Unknown Value

Example:

Write an algebraic expression.

- A number added to 6
- Double a number
- Half a number
- A number subtracted from 18
- Triple a number and add two more
- Subtract six from four times a number
- Subtract four times a number from six

(ARPDC created)

Example:

Write an expression for each cost.

- \$4 to sharpen each pair of skates for a class skating party
- hamburgers at \$3 each
- \$2 per hour plus \$5 to rent skates
- hats on sale for \$10 each

(Math Focus 7, Nelson Publishing p. 387)

Grade 6

Teacher Notes:

Students should already have learned addition and subtraction of fractions as well as multiplying a fraction by a natural number.

Order of operations are limited to:

- Bases and exponents that are natural numbers
- Exponents limited to squares and cubes.
- Decimal multiplication and division are limited to a decimal number by a natural number
- Decimal addition and subtraction limited to thousandths.
- Addition and subtraction of fractional numbers
- Multiplication of a fractional number by a natural number.

The order of operations was started in Grade 4 with 4 operations, parentheses added in Grade 5 and exponents into Grade 6.

Example:

Evaluate the expression.

a. $3^2 - 1$

b. $(6 - 4)^3 \div 2$

c. $12^2 \div 3 \times (2 + 5)$

d. $0.566 - (0.127 + 0.238)$

e. $24.5 \times 3 + 11.5 \div 5$

f. $\frac{5}{6} + \left(\frac{3}{4} - \frac{1}{3}\right)$

g. $3 \times \frac{1}{4} + \frac{1}{2}$

h. $\frac{9}{3} + (4 + 5)^2 - 5 \times 6$

(ARPDC created)

6A1.2 - Algebraic Expressions

Example:

$$7x + 3x - 2x + 4 - 2$$

- Simplify the expression.
- In the simplified expression, what is the coefficient and what is the constant term.
- How can you verify that the initial expression and the simplified expression are equivalent expressions?
- How many terms does the expression have?

Example:

a. Write 3 different equivalent expressions that are modeled by the picture.

b. Which expression is in simplest form?

(image created by [didax](#))



Solutions:

a. Answers may vary

$$3 - 1 + x + x + x \text{ or } x + x + x + 3 - 1 \text{ or } -1 + 3 + x + x + x$$

$$2x + x + 2 \text{ or } 2 + 2x + x \text{ or } 2x + 2 + x$$

$$x + x + x + 2$$

$$3x + 2 \text{ or } 2 + 3x$$

b. $3x + 2$ or $2 + 3x$

How can expressions support a generalized interpretation of number?

6A1.3 Students analyze expressions and solve algebraic equations.

Knowledge	Understanding	Skills & Procedures
All simplified forms of an equation have the same solution.	Algebraic expressions on each side of an equation can be simplified into equivalent expressions to facilitate equation solving.	<p>Simplify algebraic expressions on both sides of an equation.</p> <p>Solve equations, limited to equations with one or two operations.</p> <p>Determine different strategies for solving equations.</p> <p>Verify the solution to an equation by evaluating expressions on each side of the equation.</p> <p>Solve problems using equations, limited to equations with one or two operations.</p>

Teacher Notes:

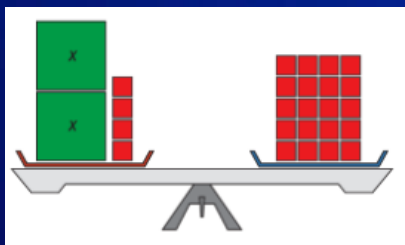
- *There are many ways to solve equations for Grade 6.*
- *Manipulatives, such as cups, balance scale, number lines, and algebra tiles are preferred when modeling the solution.*
- *Inverse operations and trial and error are suitable for symbolically solving.*
- *Limit the types of equations to Grade 6 level of ability. Students do not know how to multiply or divide negative integers.*



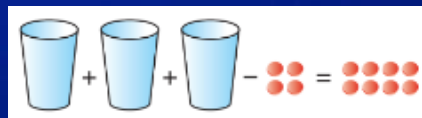
Positive Variable



Positive Unit



(MathLinks 7, Nelson Publishing, p. 411)



(MathLinks 7, Nelson Publishing, p. 411)

Let's Consider Some Examples

Example:

Tom paid a total of \$22.25 for a pizza with some toppings. The pizza without toppings cost \$18.50. Write an equation to show the cost of toppings, t .
(ARPDC created)

$$18.50 + t = 22.25$$

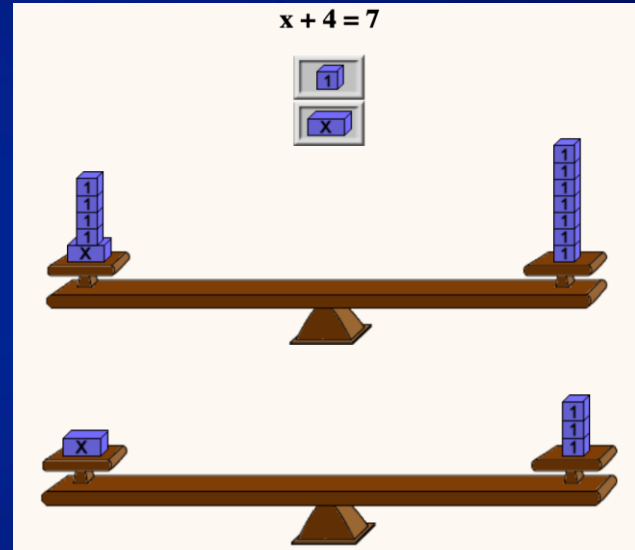
Algebra Tiles - [Didax](#)



Balance Model: One Inverse Operation

Solve

$x + 4 = 7$ using a balance model.

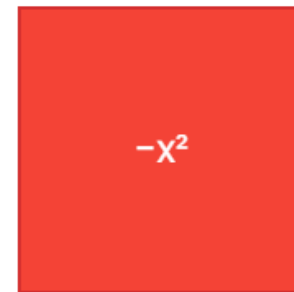


Verify

Substitution

$$(3) + 4 = 7$$
$$7 = 7$$

So What Are Alge-Tiles?



Let's Do
Integers

Algebra Tiles - Didax



Let's Solve!

$$x + 6 = 15 \text{ (inverse operations)}$$

$$x + 6 - 6 = 15 - 6$$

$$x = 9$$

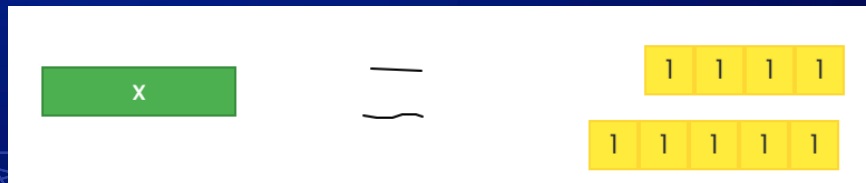
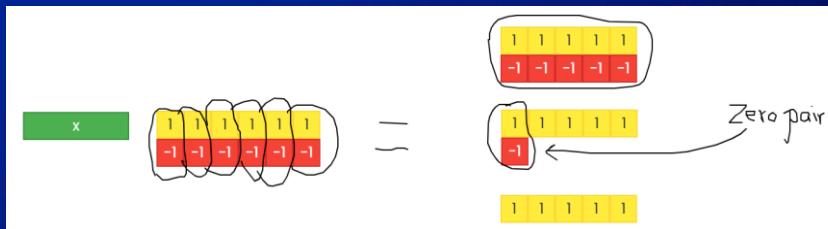
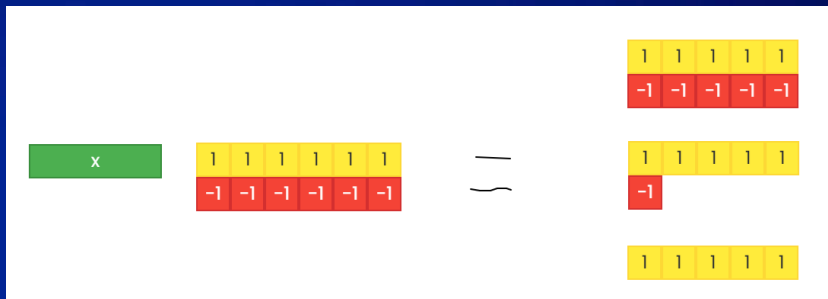
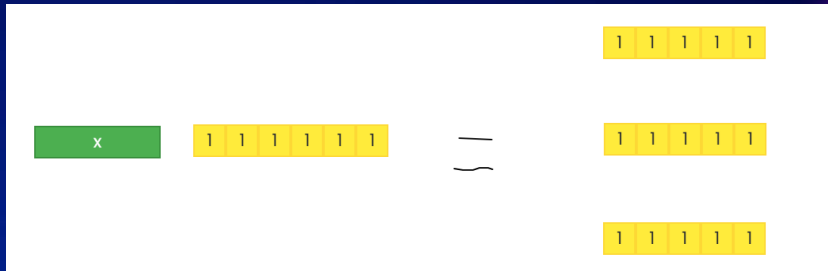
Verify

$$(9) + 6 = 15$$

$$15 = 15$$

Algebra Tiles - [Oryx Learning](#)

Algebra Tiles - [Didax](#)





Freepik stock image

Patterns

The background is a solid dark blue. It features several abstract geometric patterns. At the top corners, there are overlapping triangles in shades of purple and teal. Along the bottom edge, there are clusters of thin, light blue lines forming various geometric shapes, including triangles and polygons. The word "Patterns" is centered in a large, white, sans-serif font.

Fibonacci sequence

- what is it?

4P1.1 Students interpret and explain arithmetic and geometric sequences.		
Knowledge	Understanding	Skills & Procedures
<p>The sequences of triangular and square numbers are examples of increasing sequences.</p> <p>The Fibonacci sequence is an increasing sequence that occurs in nature.</p>	<p>Sequences may increase or decrease.</p> <p>Different representations can provide new perspectives of the increase or decrease of a sequence.</p>	<p>Investigate increasing sequences, including the Fibonacci sequence, in multiple representations.</p> <p>Create and explain increasing or decreasing sequences, including numerical sequences.</p> <p>Express a numerical sequence to represent a concrete or pictorial sequence.</p>

4P1.2 Students interpret and explain arithmetic and geometric sequences.		
Knowledge	Understanding	Skills & Procedures
<p>An arithmetic sequence progresses through addition or subtraction.</p> <p>A skip-counting sequence is an example of an arithmetic sequence.</p> <p>A geometric sequence progresses through multiplication.</p> <p>A geometric sequence begins at a number other than zero.</p>	<p>An arithmetic sequence has a constant difference between consecutive terms.</p> <p>A geometric sequence has a constant multiplicative change between consecutive terms.</p>	<p>Recognize arithmetic and geometric sequences.</p> <p>Describe the initial term and the constant change in an arithmetic sequence.</p> <p>Express the first five terms of an arithmetic sequence related to a given initial term and constant change.</p> <p>Describe the initial term and the constant change in a geometric sequence.</p> <p>Express the first five terms of a geometric sequence related to a given initial term and constant change.</p>



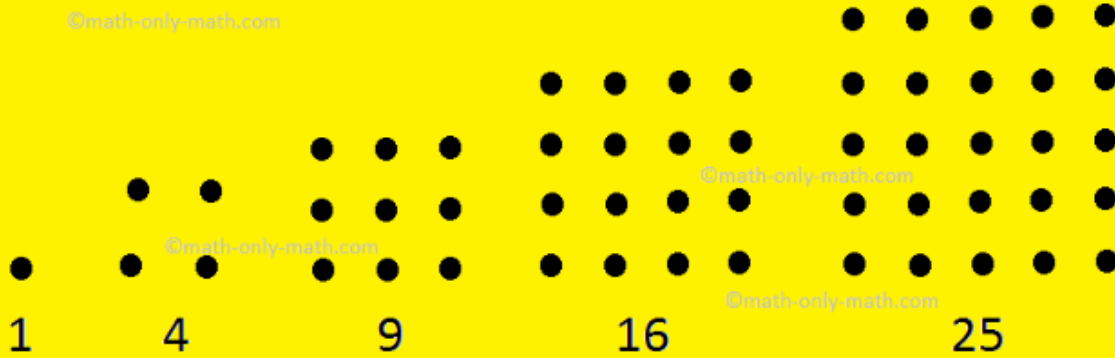
What is the Fibonacci Sequence & the Golden Ratio? Simple Explanation and Examples in Everyday Life



Square Numbers Patterns

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What is the next array?
What is its value?

1x1, 2x2, 3x3, 4x4, 5x5 ...

Math-Only-Math, Lewan math step-by-step. [Square Numbers](#)

Arithmetic or Geometric? What would the 10th term be?

0, 2, 4, 6, 8, 10, ...

2, 4, 8, 16, ...

5, 10, 15, 20, 25, ...

Solutions: 18, 50, 1024

Activity 2: Visual representation of square numbers

Using squared paper, invite children to draw squares ranging from 1x1 to 12x12 in size. Ask pupils to calculate the area of a square they've drawn. Explain that this is a square number. This visual representation deepens pupils' understanding, while exposing the structure of the concept as a calculating area.

X	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

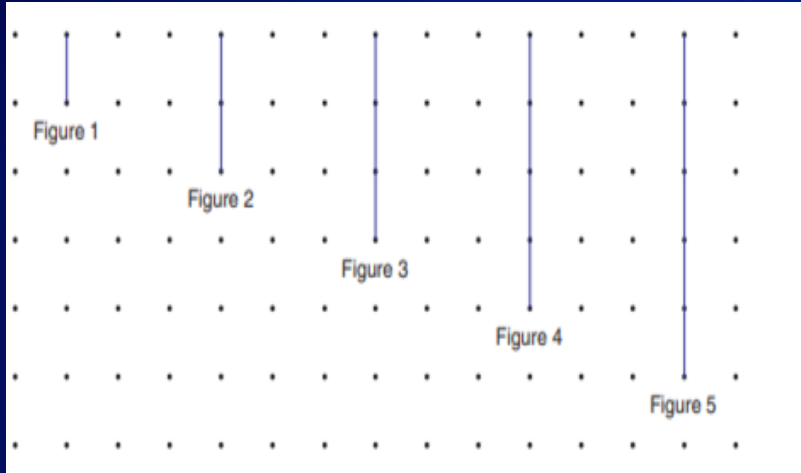
Alternatively, provide children with [this multiplication grid](#) and invite them to draw squares, starting from one in the top left-hand corner and increasing in size each time. Look at the number in the bottom right-hand corner to identify the square number.

Grade 5

Organizing Idea	Patterns: Awareness of patterns supports problem solving in various situations.		
Guiding Question	How might representation of a sequence provide insight into change?		
Learning Outcome	5P1 Students relate terms to position within an arithmetic sequence.		
	Knowledge	Understanding	Skills & Procedures
	<p>A table of values representing an arithmetic sequence lists the position in the first column or row and the corresponding term in the second column or row.</p> <p>Points representing an arithmetic sequence on a coordinate grid fit on a straight line.</p> <p>An algebraic expression can describe the relationship between the positions and terms of an arithmetic sequence.</p>	<p>Each term of an arithmetic sequence corresponds to a natural number indicating position in the sequence.</p>	<p>Represent one-to-one correspondence between positions and terms of an arithmetic sequence in a table of values and on a coordinate grid.</p> <p>Describe the graph of an arithmetic sequence as a straight line.</p> <p>Describe a rule, limited to one operation, that expresses correspondence between positions and terms of an arithmetic sequence.</p> <p>Write an algebraic expression, limited to one operation, that represents correspondence between positions and terms of an arithmetic sequence.</p> <p>Determine the missing term in an arithmetic sequence that corresponds to a given position.</p> <p>Solve problems involving an arithmetic sequence.</p>
	<p>0, 2, 4, 6, 8, 10, ...</p> <p>t_1 t_2 ...</p> <p>5, 10, 15, 20, 25, ...</p>		

Example

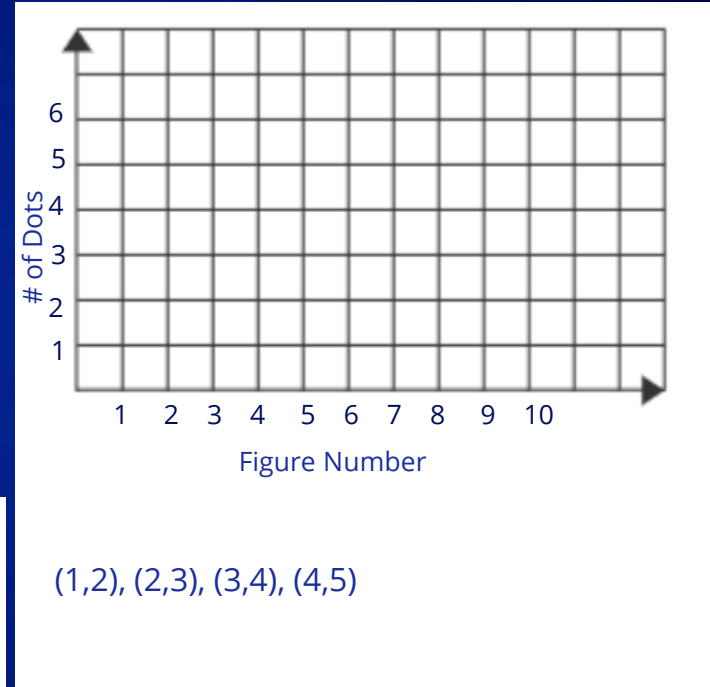
Darcy represents an arithmetic sequence using figure numbers.



- Complete the table of values.
- Describe the pattern in the sequence.
- Graph the sequence on a coordinate grid labeling Figure Number on the horizontal axis and the Number of Dots on the vertical axis.
- What do you notice about the graph?

(diagram from Math Makes Sense 5. Pearson Publishing, p.14)

Figure Number	# of Dots
1	2
2	3
3	4
4	5



$(1,2), (2,3), (3,4), (4,5)$

Term Number	3	4	5	6	7
Term	24	32	40	48	56

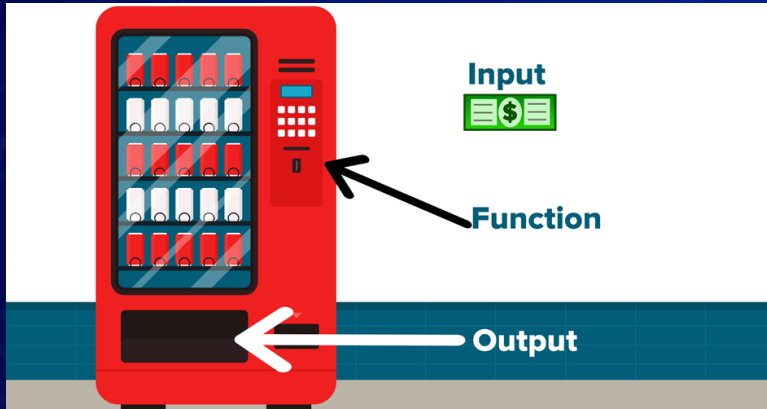
- Describe the rule that relates the term from the term number?
- Create an algebraic expression that can be used to determine the term from the term number.
- What is the coefficient of the algebraic expression?
- What is the constant change in the arithmetic sequence?
- What do you notice?

(ARPDC created)

6P1 Students investigate functions to enhance understanding of change.

Knowledge	Understanding	Skills & Procedures
<p>A variable can be interpreted as the values of a changing quantity.</p> <p>A function can involve quantities that change over time, such as</p> <p style="padding-left: 20px;">height of a person or plant temperature distance travelled</p> <p>A table of values lists the values of the independent variable in the first column or row and the values of the dependent variable in the second column or row to represent a function at certain points.</p> <p>The values of the independent variable are represented by x-coordinates in the Cartesian plane.</p> <p>The values of the dependent variable are represented by y-coordinates in the Cartesian plane.</p>	<p>A function is a correspondence between two changing quantities represented by independent and dependent variables.</p> <p>Each value of the independent variable in a function corresponds to exactly one value of the dependent variable.</p>	<p>Identify the dependent and independent variables in a given situation, including situations involving change over time.</p> <p>Describe the rule that determines the values of the dependent variable from values of the independent variable.</p> <p>Represent corresponding values of the independent and dependent variables of a function in a table of values and as points in the Cartesian plane.</p> <p>Write an algebraic expression that represents a function.</p> <p>Recognize various representations of the same function.</p> <p>Determine a value of the dependent variable of a function given the corresponding value of the independent variable.</p> <p>Investigate strategies for determining a value of the independent variable of a function given the corresponding value of the dependent variable.</p> <p>Solve problems involving a function.</p>

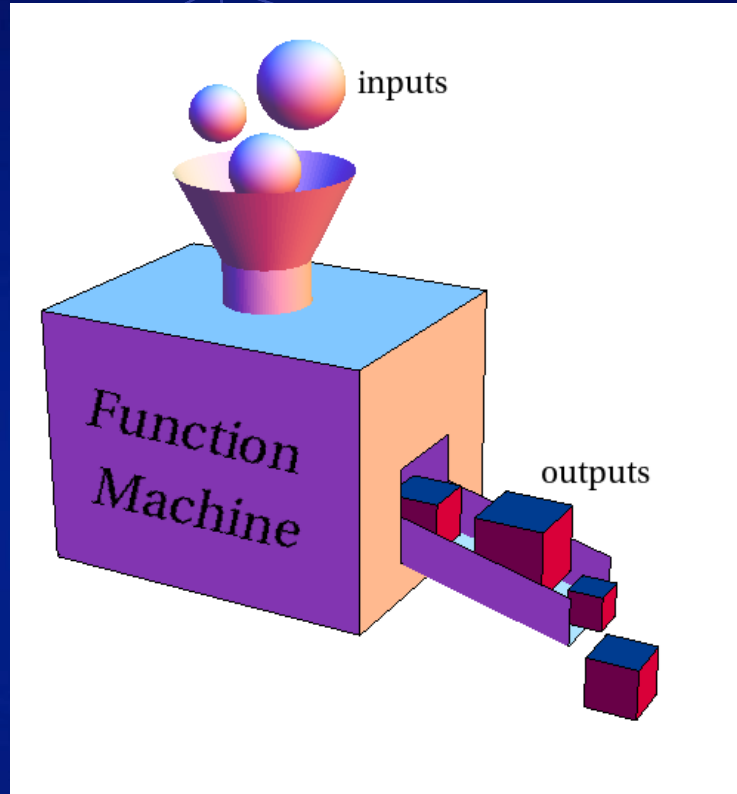
Functions in Real Life



- Functions are not just in math class; they're everywhere!
- Distance traveled can be a function of time.
- Money saved can be a function of the amount saved each week.
- What are some functions you encounter daily?

Understanding the Function Machine

- Imagine a function as a machine: you put numbers in, it does something to them, and then gives numbers out.
- The machine's "job" is the rule of the function.
- This rule tells us how to connect the input to the output.
- What do you think happens inside the function machine?



What is the rule?

Input (x)	Output ()
2	7
3	8
4	9
5	10

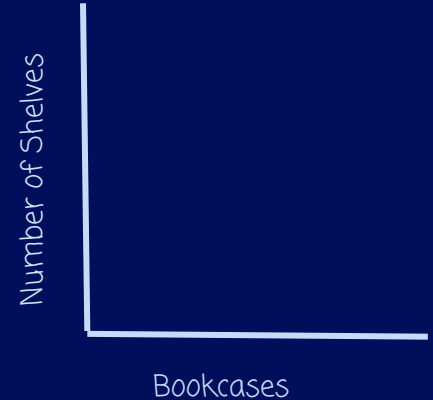
Translating the “Words” to “Ordered Pairs”

Bookcase vs # of Shelves

- a) Copy the table of values into your notebook. Complete the table for the first five bookcases in the pattern.

Bookcase	Number of Shelves
1	4
2	8

- b) What is an expression for the number of shelves in a bookcase?
c) What does your variable represent?



Source: MathLinks 7, Nelson Publishing. Chapter 10, p.369

Translating the “Words” to “Ordered Pairs”

Bookcase vs # of Shelves

X value in an ordered pair

Y value in an ordered pair

- a) Copy the table of values into your notebook. Complete the table for the first five bookcases in the pattern.

Bookcase	Number of Shelves
1	4
2	8

- b) What is an expression for the number of shelves in a bookcase?
c) What does your variable represent?

Number of Shelves

Bookcases

Example:

Figure 1



Figure 2



Figure 3

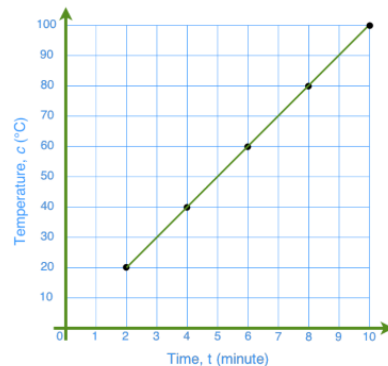


- Create a table using the above pattern.
- Is this a function?
- What is the independent variable?
- What is the dependent variable?
- Extend the table to the 6th figure.
- Write the first six ordered pairs from the table of values chart.
- Plot the result on a Cartesian Plane.

(ARPC created)

Example:

The graph shows the relationship of the temperature of water, c , and time, t , as water boils.



- What is the independent variable?
- What is the dependent variable?
- What is the temperature at 7 minutes?

(source StudyPug.com)

Example:

Which rule is applied to the independent variables in order to get the corresponding dependent variables?

- Add 3
- Subtract 3
- Multiply by 2
- Divide by 2

(ARPC created)

Independent Variable	Dependent Variable
3	6
5	8
6	9
8	11



Statistics

What's the Question?

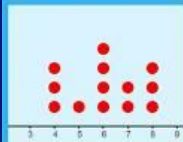
Statistical Problem Solving Process

In what ways can communication be shaped by the choice of representation?

4ST1.1 Students evaluate the use of scale in graphical representations of data.

Knowledge	Understanding	Skills & Procedures
<p>A statistical problem-solving process includes</p> <ul style="list-style-type: none">● formulating statistical questions● collecting data● representing data● interpreting data	<p>Representation is part of a statistical problem-solving process.</p>	<p>Engage in a statistical problem-solving process.</p>

Statistical Questions and Dot Plots



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

How might frequency bring meaning to data?

5ST1.1 Students analyze frequency in categorical data.

Knowledge	Understanding	Skills & Procedures
<p>Frequency can be compared across categories to answer statistical questions.</p> <p>The mode is the category with the highest frequency.</p>	<p>Frequency is a count of categorized data, but it is not the data value itself.</p>	<p>Examine categorized data in tables and graphs.</p> <p>Determine frequency for each category of a set of data by counting individual data points.</p> <p>Identify the mode in various representations of data.</p> <p>Recognize data sets with no mode, one mode, or multiple modes.</p> <p>Justify possible answers to a statistical question using mode.</p>

Open-ended and Closed-list Questions

Examine the questions below.

Which type of juice is your favourite?
Why?

Which type of juice do you prefer:

- a. apple
- b. orange
- c. grape

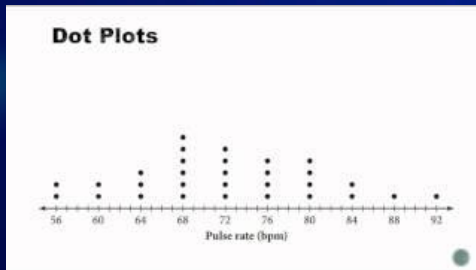
Which question is closed-list and which is an open-ended?

Which type of questions gives you a deeper understanding of a person's pop preference? Why?

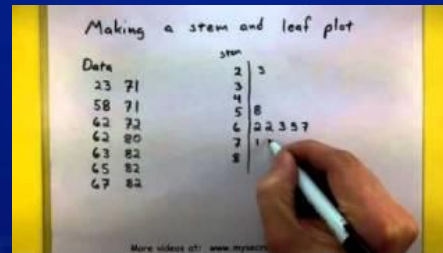
5ST1.2 Students analyze frequency in categorical data.

Knowledge	Understanding	Skills & Procedures
<p>Data can be collected by asking closed-list and open-ended questions.</p> <p>Closed-list questions provide a list of possible responses to choose from.</p> <p>Open-ended questions allow any response.</p> <p>Responses can be categorized in various ways.</p> <p>Representations of frequency can include</p> <ul style="list-style-type: none"> bar graphs dot plots stem-and-leaf plots 	<p>Frequency can be a count of categorized responses to a question.</p> <p>Frequency can be used to summarize data.</p> <p>Frequency can be represented in various forms.</p>	<p>Discuss potential categories for open-ended questions and closed-list questions in relation to the same statistical question.</p> <p>Formulate closed-list questions to collect data to answer a statistical question.</p> <p>Categorize data that was collected using closed-list questions.</p> <p>Organize counts of categorized data in a frequency table.</p> <p>Create various representations of data, including with technology, to interpret frequency.</p>

Discuss, Formulate, Categorize, Organize, Create



Bar Graphs and Dot Plots



How To make Stem and Leaf Plot
MySereMathTutor

Local highschool data

How many hours of homework do you do each day?

Frequency

Time Spent on Homework (Hours)	Tally	Frequency (# of students)
[0 – 0.5)		12
[0.5 – 1.0)		23
[1.0 – 1.5)		34
[1.5 – 2.0)		26
[2.0 – 2.5)		5
2.5+		0

Frequency

Mode

MathLinks 7, Nelson Learning Center. Pages 426-427

14. Ben asked 50 people at random in a mall the following question.

Are you allergic to any of these animals?

- A cats
- B dogs
- C birds
- D gerbils
- E hedgehogs

His results are displayed.

Animal Allergy	Frequency	Total
Cats		26
Dogs		12
Birds		8
Gerbils		4
Hedgehogs		0

- a) Ben made the following predictions based on his data. Do you agree with each prediction? Explain.
- Almost 25% of the population is allergic to dogs.
 - Hedgehogs do not cause allergies.
- b) Improve the survey question. Explain your reasoning.

In the situation where the students answer in turn or live poll, we can use a modified tally table, which contain a column to record the data.

Can you use the table given to you to interpret the information?

How Did The Children Wake Up This Morning?

Options	Data	Number of Students
My parent woke me up		7
I woke up on my own		4
My alarm clock woke me up		8
Other		3
Total		22

How can frequency support communication?

Grade 6

6ST1.1 Students investigate relative frequency using experimental data.

Knowledge	Understanding	Skills & Procedures
Relative frequency can be used to compare the same category of data across multiple data sets. Relative frequency can be represented in various forms.	Relative frequency expresses the frequency of a category of data as a fraction of the total number of data values.	Interpret frequency of categorized data as relative frequency. Express relative frequencies as decimals, fractions, or percentages.

The fraction, decimal and/or percentage of times an event occurs.

Data can be organized by category or groups.

Katie asks 10 of her friends whether they prefer chocolate, vanilla, or strawberry ice cream. Their responses are in the table below.

Ally	Beth	Charley	David	Eli	Frank	Greg	Hannah	Isla	Jack
chocolate	vanilla	chocolate	chocolate	strawberry	chocolate	vanilla	vanilla	strawberry	chocolate

Katie asks 10 of her friends whether they prefer chocolate, vanilla, or strawberry ice cream. Their responses are in the table below.

Ally	Beth	Charley	David	Eli	Frank	Greg	Hannah	Isla	Jack
chocolate	vanilla	chocolate	chocolate	strawberry	chocolate	vanilla	vanilla	strawberry	chocolate

Step 2: List the categories under the *Category* column and the frequency of each category under the *Frequency* column.

Our categories are *chocolate*, *vanilla*, and *strawberry*, so we will list these in the *Category* column.

Category (Ice Cream Flavor)	Frequency	Relative Frequency
Chocolate		
Vanilla		
Strawberry		

5 friends voted chocolate, 3 friends voted vanilla, and 2 friends voted strawberry, so we will enter these values in our *Frequency* column.

Category (Ice Cream Flavor)	Frequency	Relative Frequency
Chocolate	5	
Vanilla	3	
Strawberry	2	

Step 3: Complete the *Relative Frequency* column by dividing the frequency of each category by the total number of data points.

There are 10 total data points, so we will divide each frequency by 10 to determine the relative frequencies and complete the table.

Category (Ice Cream Flavor)	Frequency	Relative Frequency
Chocolate	5	$5/10 = 0.5$
Vanilla	3	$3/10 = 0.3$
Strawberry	2	$2/10 = 0.2$

This completes our relative frequency table.

Source: [Study.com](https://www.study.com) Representing Data

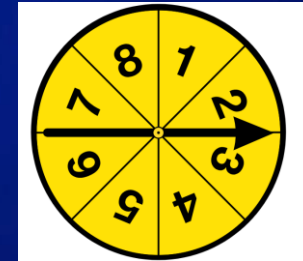
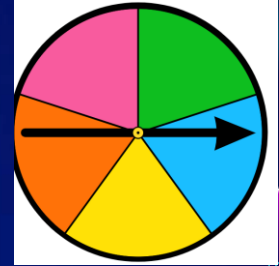
Skills & Procedures

Interpret frequency of categorized data as relative frequency.

Express relative frequencies as decimals, fractions, or percentages.

6ST1.2 Students investigate relative frequency using experimental data.

Knowledge	Understanding	Skills & Procedures
<p>Equally likely outcomes of an experiment have the same chance of occurring.</p> <p>An event can be described as a combination of potential outcomes of an experiment, including</p> <ul style="list-style-type: none"> heads or tails from a coin toss any roll of a die the result of spinning a spinner <p>The law of large numbers states that more independent trials of an experiment result in a better estimate of the expected likelihood of an event.</p>	<p>Frequency can be a count of categorized observations or trials in an experiment.</p> <p>Relative frequency of outcomes can be used to estimate the likelihood of an event.</p> <p>Relative frequency varies between sets of collected data.</p> <p>Relative frequency provides a better estimate of the likelihood of an event with larger amounts of data.</p>	<p>Identify the possible outcomes of an experiment involving equally likely outcomes.</p> <p>Collect categorized data through experiments.</p> <p>Predict the likelihood of an event based on the possible outcomes of an experiment.</p> <p>Determine relative frequency for categories of a sample of data.</p> <p>Describe the likelihood of an outcome in an experiment using relative frequency.</p> <p>Analyze relative frequency statistics from experiments with different sample sizes.</p>



Understanding	Skills & Procedures
Frequency can be a count of categorized observations or trials in an experiment.	Identify the possible outcomes of an experiment involving equally likely outcomes.
Relative frequency of outcomes can be used to estimate the likelihood of an event.	Collect categorized data through experiments.
Relative frequency varies between sets of collected data.	Predict the likelihood of an event based on the possible outcomes of an experiment.
Relative frequency provides a better estimate of the likelihood of an event with larger amounts of data.	Determine relative frequency for categories of a sample of data.
	Describe the likelihood of an outcome in an experiment using relative frequency.
	Analyze relative frequency statistics from experiments with different sample sizes.

Example:

Exploring expected frequency (theoretical probability) In a game, students have a deck of cards.

If a random card pulled is a number card, Player A scores a point.

If a random card pulled is a face card, Player B scores a point.

The player who scores 20 points first wins the game.

Who do you predict is more likely to win? Why?

Play the game with a partner. Decide who will be Player A and Player B. Record your results in a tally chart.

Who won? How does this compare with your prediction?

Type of Card	Frequency
Number Card	25
Face Card	5

The relative frequency for number cards is $25/30$ or $5/6$ 0.83 or 83%

Based on the relative frequency the likelihood of getting a number card is greater than the likelihood of getting a face card.

Because there are 10 number cards and 3 face cards, the expected likelihood is to get more number cards.

(Math Makes Sense 6, Pearson Education Canada, p. 271)

Resources

Ontario Math Strand: Data

A variety of links and exemplars that giving additional support for Statistic

Math Toolbox

One location for accessing most of the virtual manipulatives.

[Link](#)

Will He? Won't He?

A Math Activity

The purpose of this activity is to engage students in considering another's statement about the probability of an outcome in a game of chance.

Wrapping Up

Survey

Please take a moment to complete this 1 minute survey emailed to you.

What are your needs heading into 2024-2025

As you have now gone through the new Math 4 Curriculums, what are your needs for the coming year. Connect with your local consortia.

CPAR Documents will continue to be posted

Continue to check the arpdcc website

Resources

New LearnAlberta

<https://curriculum.learnalberta.ca/home/en>

ARPDC Resource Site

https://arpdc.ab.ca/focuses/math/?site_language=english&set=1&sort_by=1&grade_level=&media_type=&resource_type=179

Math Verbs

[Grades K-3](#)

[Grades 4-6](#)

Thank YOU!

It has been a pleasure to work alongside you this school year. Best wishes for the remainder of the year!

Do not hesitate to reach out to local consortia if you have any questions.

Facilitator: Chris Zarski chris.arski@arpdc.ab.ca

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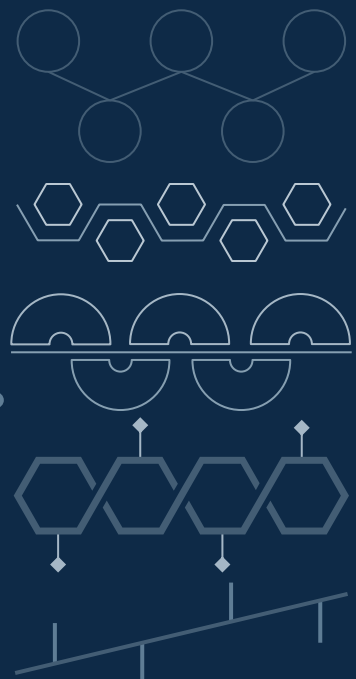
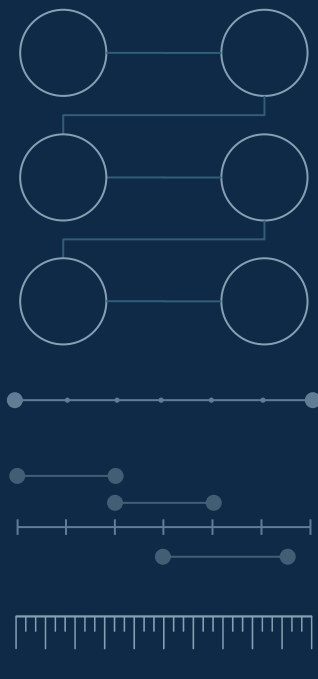
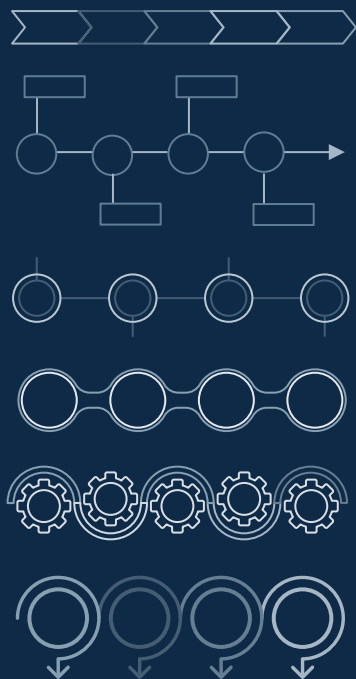
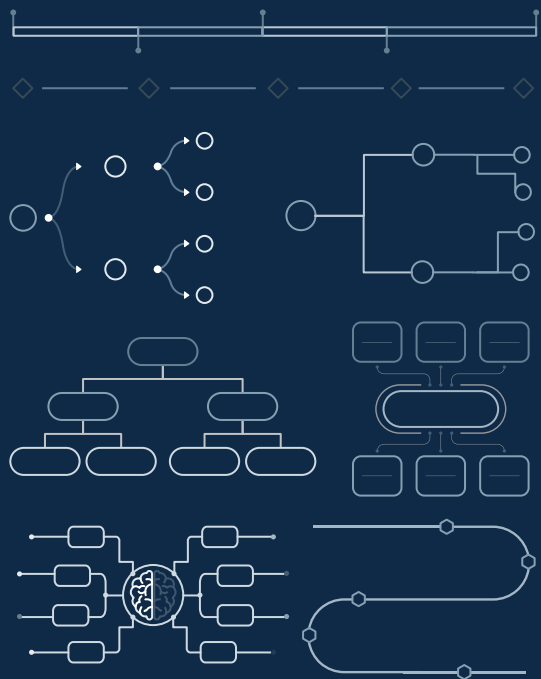
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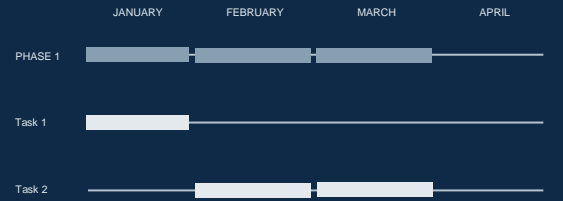
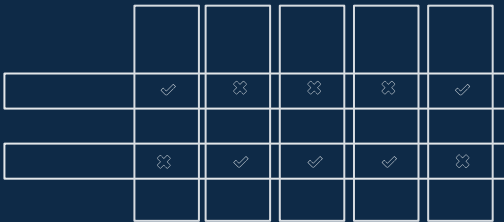
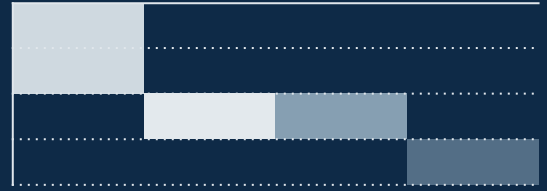
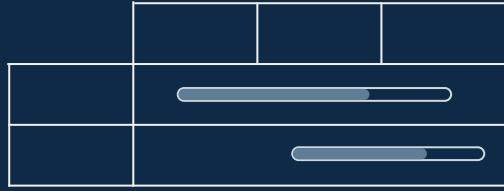
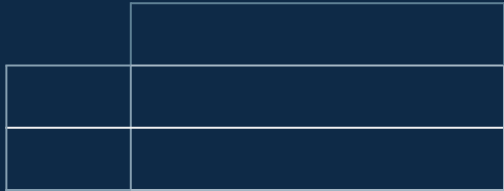
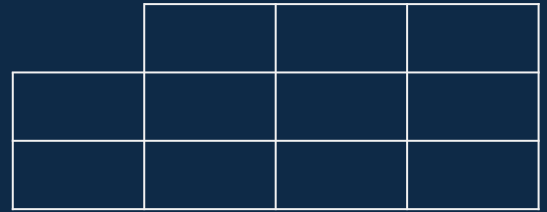
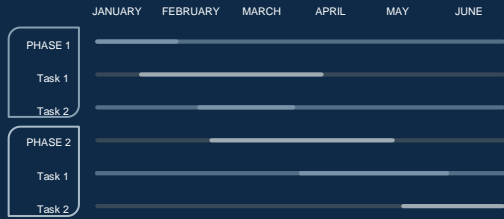




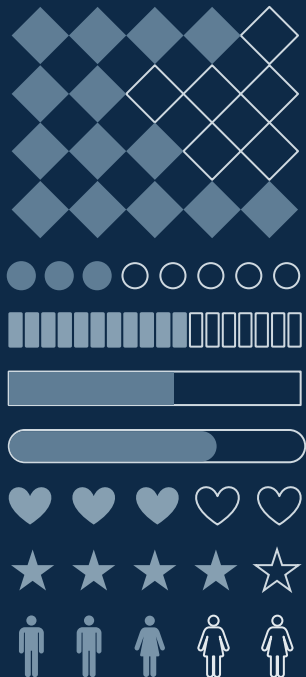
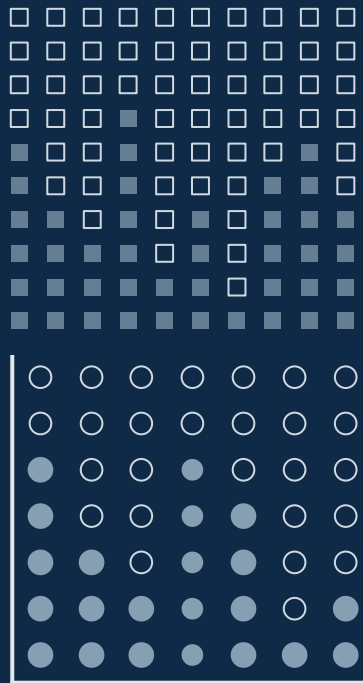
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Creative Process Icons



Performing Arts Icons



Nature Icons



