Key Learning for Grade 3

The Ontario Curriculum: Mathematics (2005)

Number Sense and Numeration

- **Read, represent, compare and order whole numbers to 1000, and use concrete materials to investigate fractions and money amounts to $10**
- **Demonstrate an understanding of magnitude by counting forward and backwards by various numbers and from various starting points**
- **Solve problems involving the addition and subtraction of single- and multi-digit whole numbers, using a variety of strategies, and demonstrate an understanding of multiplication and division**

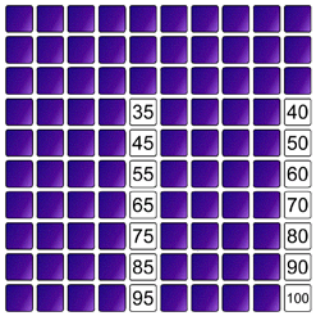
Counting

Count forward by 1's, 2's, 5's, 10's, 100's to 1000 from various starting points, and by 25's to 1000 from multiples of 25 using a variety of tools and strategies

Sample activity: Have your child determine the value of a collection of quarters using the strategy of skip counting by 25.

Count backwards by 2's, 5's, and 10's from 100 using multiples of 2, 5, and 10 as starting points,

Sample activity: Ask your child to use a hundreds chart to count by 5's, beginning at 35, up to 100.



Count backwards by 100's from 1000 and any number less than 1000

Sample activity: Ask your child to count backwards by 100's, beginning at 987 and ending at 0.

- "987, 887, 787, 687, 587, 487, 387, 287, 187"

Money

Represent and describe the relationships between coins and bills up to $10

- "I know that having two $5 bills is the same as one $10 bill."

Estimate, count and represent (using the $ symbol) a collection of coins to $10

Sample activity: Show $7.61 using the fewest number of coins possible.

- Given that there is no longer a physical penny, your child might instead round the dollar amount and show the amount below without the penny ($7.60).

$7.61

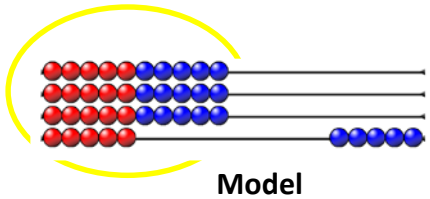
Add and subtract money amounts to make simulated purchases and change for up to $10, using a variety of tools, e.g., coins

Sample activity: Have your child use real, virtual (mathies.ca), or play money to determine the change you should receive if you purchase a pizza for $8.94 with a $10 bill.

- Your child could count up from $8.94, e.g., give a penny (to $8.95), then a nickel (to $9.00), then a loonie (to $10.00)
- Your child could count down from $10.00, e.g., give a loonie (to $9.00), then a nickel, (to $8.95) then a penny (to $8.94)
- Your child could also round to $8.95 (no penny)

Whole Numbers

Represent numbers to 1000, using a variety of tools;
Read and print number words to one hundred;



Model

Picture

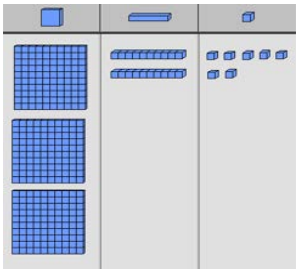
35

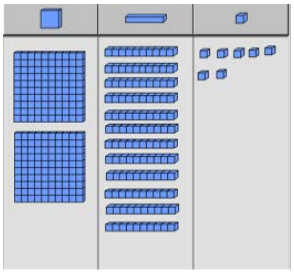
Symbol

Thirty-five

Words

Identify and represent the value of a digit in a number according to its position in the number, e.g., 3 in 327 represents 3 hundreds (300);





Compose and decompose three-digit numbers into hundreds, tens, and ones;

- "327 is equal to 3 hundreds, 2 tens and 7 ones or 2 hundreds, 12 tens, and 7 ones."

Understand the relationship among the numbers 1, 10, 100 and 1000, e.g., there are ten 10's in 100;

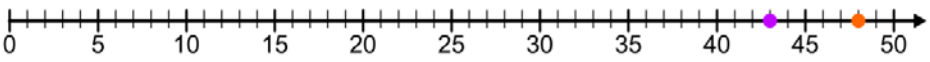
- "There are ten dimes in one dollar."

Compare and order numbers to 1000;

- "I know that 327 is smaller than 723 because 3 hundreds are less than 7 hundreds."

Round two-digit numbers to the nearest ten;

- "I can see that 43 is closer to 40 and that 48 is closer to 50."



Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1000;

Fractions

Divide whole objects and sets of objects into equal parts, and identify the parts using fractional names, e.g., one half, two-thirds (without using standard fractional notation)

Sample activity: Have your child show you half the apple when it is cut in halves or in quarters.

- "I can split the set of 12 equally into **fourths** that have 3 things each."

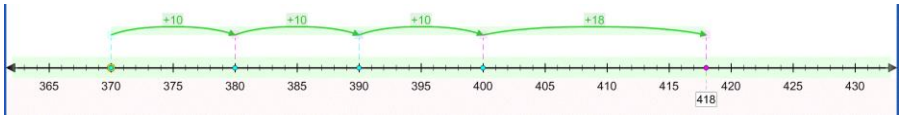
Operational Sense

Solve problems involving the addition and subtraction of two-digit numbers, using a variety of mental strategies;

- "To add 37 + 48, I add the tens, add the ones, and **combine them** like this: 30 + 40 =70, 7 + 8 = 15, **70 + 15 = 85."**

Add and subtract three-digit numbers using concrete materials, student-generated algorithms, and standard algorithms;

- "I used a number line to add 370 + 48. I started at 370 and made three hops ten, which is 30, and I landed on 400. I then made a hop of 18 to get to 418"



Multiply to 7 × 7 and divide to 49 ÷ 7, using a variety of mental strategies

×	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	8	10	12	14
3	3	6	9	12	15	18	21
4	4	8	12	16	20	24	28
5	5	10	15	20	25	30	35
6	6	12	18	24	30	36	42
7	7	14	21	28	35	42	49

Use estimation when solving problems involving addition and subtraction, to help judge the reasonableness of a solution;

- "To estimate 370 + 48, I can think about 370 + 50."

Relate multiplication of one-digit numbers and division by one-digit divisors to real life situations, e.g., there are 3 groups of 2 shoes in the hallway, for a total of six shoes;

- "If I organize the six shoes into pairs, there are three pairs in total."
- 3 groups of 2 shoes = 6 shoes
- 6 shoes divided into 2 = 3 pairs

Measurement

- **Estimate, measure, and record length, perimeter, area, mass, capacity, time, and temperature, using standard units;**
- **Compare, describe, and order objects, using attributes measured in standard units.**

Time

Read time using analogue clocks, to the nearest five minutes;

Read digital clocks

- "12:45 means forty-five minutes after twelve o'clock";

Represent time in 12-hour notation, e.g., 12:45 p.m.;

Attributes, Units, and Measurement Sense

Estimate, measure, and record length, height, and distance using standard units (cm, m, km);

Draw items using a ruler, given specific lengths in centimetres;
Sample activity: Have your child draw lines of length 3 cm, 7 cm, 2 cm, and 6 cm, and then order them from shortest to longest.

Estimate, measure and record the perimeter (distance around) of two-dimensional shapes using standard units;
Sample activity: Have your child find the perimeter of a placemat, in cm, using a piece of string.

Estimate, measure, and record area (size of the surface) using centimeter grid paper and arrays;
Sample activity: Have your child guess, then check, how many blocks are needed to cover a shape.

Have a personal referent (benchmark) for kilogram and litre;
Sample activity: Work with your child to find items in your home that are one kilogram and one litre. Use this item to make comparisons to other things, e.g., is an orange more or less than a kilogram?

Estimate, measure and record the mass of objects using kilograms or parts of a kilogram (half, quarter);
Sample activity: When shopping, have your child measure bulk food items using a quarter-, a half, or a full kilogram.

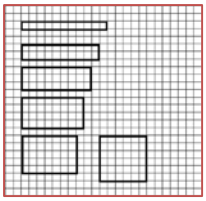
Estimate, measure, and record the capacity of containers, using litres or parts of litres (half, quarter);
Sample activity: Draw attention to containers in your grocery cart that are a quarter-, a half-, or a full litre.

Understanding Measurement Relationships

Compare standard units of length (cm, m, km) and select and justify the most appropriate unit in a measuring situation;

Compare and order objects on the basis of linear measurements in centimetres or metres (e.g., shortest to longest);
Sample activity: Play a game such as "More or Less" or "About?" Select an item, such as a shoe, and ask your child if it is more or less than a given length, e.g., 30 cm, or closer to 10 cm, 20 cm, 30 cm, or 40 cm in length.

Compare and order various shapes by area, using congruent (identical in size) shapes, e.g., blocks and grid paper for measuring;
Sample activity: Have your child measure the area of different shapes using blocks or grid paper and then order them from smallest to largest.

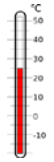


Describe, through investigation with grid paper, the relationship between the size of a unit of area and the number of units needed to cover the surface (e.g., using two-centimetre grid paper will result in a smaller count for area than using one-centimetre grid paper);

Compare and order a collection of objects using standard units of mass (kg) and capacity (L);

Solve problems involving the relationships between minutes and hours, hours and days, days and weeks, and weeks and years;

Temperature



Estimate and read positive temperatures on a thermometer, to the nearest degree Celsius;

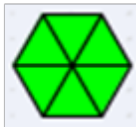
Identify benchmarks for freezing, cold, cool, warm, hot, and boiling temperatures as they relate to water and cold, cool, warm, and hot temperatures as they relate to air (e.g., water freezes at 0°C; the air temperature on a warm day is about 20°C).
Sample activity: Help your child to establish benchmarks for temperature, e.g., "The day that we went to the beach was hot."

Geometry and Spatial Sense

- **Compare two-dimensional shapes and three-dimensional figures and sort them by their geometric properties;**
- **Describe relationships between two-dimensional shapes, and between two-dimensional shapes and three-dimensional figures;**
- **Identify and describe the locations and movements of shapes and objects.**

Geometric Relationships

Solve problems requiring the greatest or least number of two-dimensional shapes (e.g., pattern blocks) needed to compose a larger shape in a variety of ways (e.g., to cover an outline puzzle);



- "Two ways to make a hexagon are with two trapezoids or six triangles."

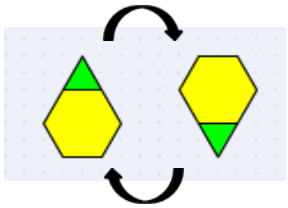
Explain the relationships between different types of quadrilaterals;
"A square is a rectangle because a square has four sides and four right angles."

Identify and describe the two-dimensional shapes that can be found in a three-dimensional figure;

Describe and name prisms and pyramids by the shape of their base;

- "A square-based pyramid has triangles for sides (faces) and a square for the bottom (base)."

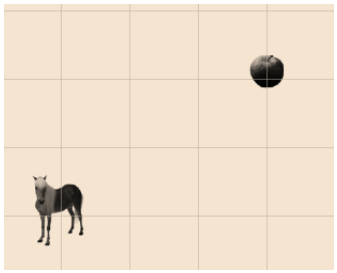
Identify congruent two-dimensional shapes by manipulating and matching concrete materials (e.g., by translating, reflecting, or rotating pattern blocks);



- "The two shapes are congruent because one can become the other when I rotate it."

Location and Movement

Describe movement from one location to another using a grid map, e.g., to get to the apple, the horse could move up two units and then right three units, or to the right three units, then up two units;



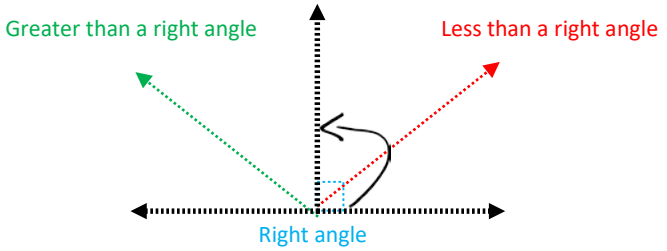
Identify flips, slides, and turns and name them as reflections, translations, and rotations, e.g., a slide to the right is a translation; a turn is a rotation; a flip is a reflection

- A geometric transformation is a change in position or size. Only positional transformations are explored in Grade 3:
- A flip, or reflection, is a geometric transformation where an object is turned over a mirror line so that it faces the opposite direction, producing a mirror image.
- A slide, or translation, is a geometric transformation where an object is moved in any direction, without being rotated or reflected.
- A turn, or rotation, is a geometric transformation where an object is turned around a centre point.

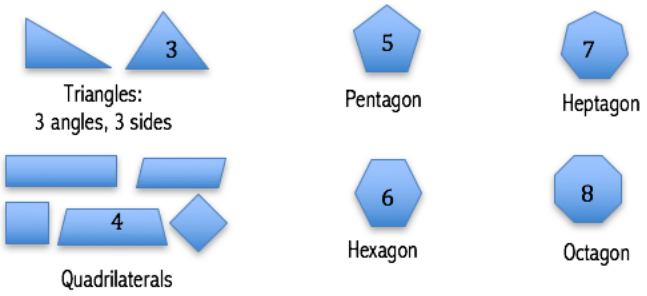
Complete and describe designs and pictures of images that have a vertical, horizontal, or diagonal line of symmetry;
Sample activity: Finish the picture below so that the result is a snowflake that is symmetrical.

Geometric Properties

Use a reference tool (e.g., paper corner) to identify right angles and to describe angles as greater than, equal to, or less than a right angle



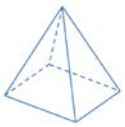
Compare various angles, using concrete materials and representations, and describe angles as bigger than, smaller than, or about the same as other angles



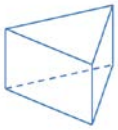
Identify and compare various polygons and sort them by their geometric properties (i.e., number of sides, side length, number of inside angles, number of right angles)

Compare and sort prisms and pyramids by geometric properties (i.e., number and shape of faces, number of edges, number of vertices), using concrete materials;

- A prism has two congruent and parallel bases and a pyramid has one base. The sides of a pyramid are always triangular in shape and taper to meet at the top, which is called the vertex or apex.
- Prisms and pyramids take their names from the shape of their base, e.g., a triangular pyramid has a triangular base and a triangular prism has two triangular bases.



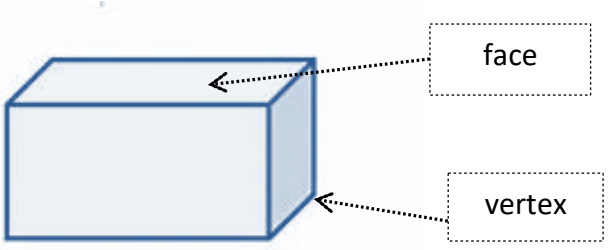
Square-based Pyramid

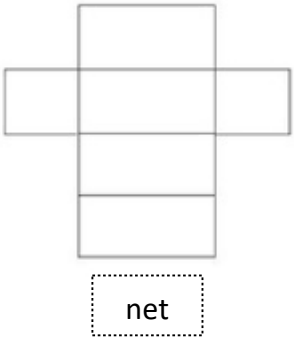


Triangular-based Prism

Construct rectangular prisms (e.g., using paper nets) and describe geometric properties (i.e., number and shape of faces, number of edges, number of vertices) of the prism.

- A face is a flat surface of a 3D figure (solid).
- An edge is where two faces of a 3D figure meet.
- A vertex is where the edges of a 3D figure meet.





Sample Activity: Have your child dismantle a tissue box to make a net.

Patterning and Algebra

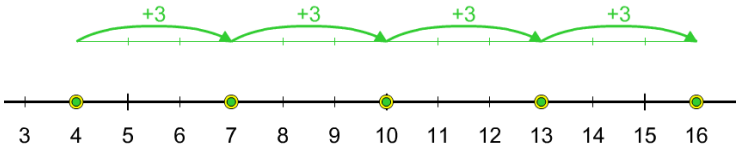
- **Describe, extend and create a variety of numeric patterns and geometric patterns;**
- **Demonstrate an understanding of equality between pairs of expressions, using addition and subtraction of one- and two-digit numbers.**

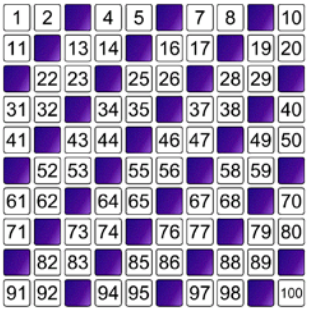
Patterns and Relationships

Identify, extend, and create a repeating pattern involving two attributes (e.g., size, colour, orientation) using a variety of tools;

- "The size goes big, big, small, big, big, small, big, big, small, and the colour goes red, blue, red, blue, red, blue, red, blue, red."

Identify and describe number patterns involving addition, subtraction, and multiplication, represented on a number line, a calendar, and on a hundreds chart





- "The numbers are going up by 3 each time."

Extend repeating, growing, and shrinking number patterns;

Sample activity: What are the next three terms in the pattern 3, 6, 12…?

Create a number pattern involving addition or subtraction, given a pattern represented on a number line or a pattern expressed in words;

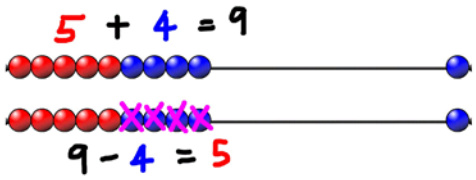
Represent simple geometric patterns using a number sequence, a number line, or a bar graph;

- "I can represent the pattern of the toothpicks with the number sequence 4, 7, 10,… I keep adding 3 each time."

Demonstrate an understanding that a pattern results from repeating an action (e.g., clapping), repeating an operation, using a transformation (slide, flip, turn) or making some repeated change to an attribute (e.g., colour, size);

Expressions and Equality

Demonstrate, through investigation, the inverse relationship between addition and subtraction;



"I know that since 5 + 4 = 9, then 9 – 4 = 5."

Determine the missing number in equations involving addition and subtraction of one- and two-digit numbers using a variety of tools and strategies;

$$25 - 4 = 15 + \square$$

"I know that the value on both sides of the equal sign has to be the same, or equivalent. The left side is equal to 25 - 4 or 21, so the right side must be equal to 21 too. I already have 15, so I will need 6 more to have 21. So the missing number is 6."

Identify the properties of zero and one in multiplication, i.e., that any number multiplied by zero equals zero and any number multiplied by 1 equals itself;

Identify and use the associative property of addition to facilitate computation with whole numbers.

- The associative property allows the numbers being added to be regrouped without changing the outcome, e.g., (7 + 9) + 1 = 7 + (9 + 1). First add 9 + 1 to get 10 and then add the 7 for a total of 17.
- Using the associative property can simplify computations.

Data Management and Probability

- **Collect and organize categorical or discrete primary data and display the data using charts and graphs, including vertical and horizontal bar graphs, with labels ordered appropriately along horizontal axes, as needed;**
- **Read, describe, and interpret primary data presented in charts and graphs, including vertical and horizontal bar graphs;**
- **Predict and investigate the frequency of a specific outcome in a simple probability experiment.**

Collecting and Organizing Data

Demonstrate an ability to organize objects into categories, by sorting and classifying objects using two or more attributes simultaneously;
Sample activity: Ask your child to sort a collection of buttons by size, colour, and number of holes.

Collect data by conducting a simple survey about themselves, their environment, issues in their community, or content from another subject;
Sample activity: Have your child conduct a survey of your household members to determine one practice that can be implemented to reduce electricity use, and then analyze the data to determine one recommendation for action.

Collect and organize categorical or discrete primary data and display the data in charts, tables and graphs (including vertical and horizontal bar graphs), with appropriate titles and labels and with labels ordered appropriately along horizontal axes, as needed, using many-to-one correspondence;

Data Relationships

Read primary data presented in charts, tables, and graphs (including vertical and horizontal bar graphs), then describe the data using comparative language and describe the shape of the data (e.g., most of the data are at the high end);

Interpret and draw conclusions from data presented in charts, tables, and graphs;

Sample prompts:
Which animal was chosen most by the class?
Which animal was chose least by the class?
How might you explain the results?

Demonstrate an understand of mode and identify it for a set of data;

- The mode is the value that shows up the most in a set of data.

Sample activity: Find the mode of the set of numbers: 19, 17, 12, 13, 14, 13, 15, 13, 20, 17.

"To find the mode, I put the numbers in order first: 12, 13, 13, 13, 14, 15, 17, 17, 19, 20. Then I could see that the most frequent number, or mode, is 13."

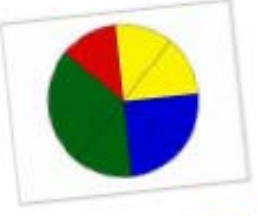
Probability

Predict the frequency of an outcome in a simple probability experiment or game, perform the experiment, and compare the results with the predictions using mathematical language

Sample activity: Have your child predict how many times an even number will come up if a die is rolled 20 times. Have your child conduct the experiment and compare the results using mathematical language, e.g., I expected 10 even numbers, but my result was greater than that.

Demonstrate, through investigation, an understanding of fairness in a game and relate this to the occurrence of equally likely outcomes with simple games and probability experiments

Sample activity: Have your child fix the spinner so that the arrow has a fair chance of landing on either red, yellow, blue, or green.

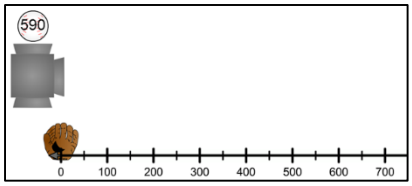


Learning Activities for Grade 3 with mathies.ca

Quantity: Whole Numbers to 1000

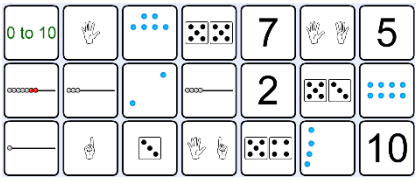
Game: Catch a Bouncing Ball

- Work with numbers to 1000



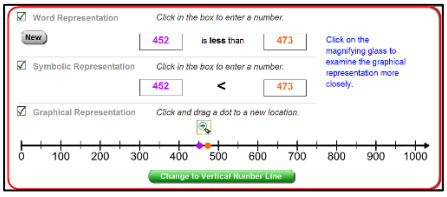
Game: Representation Match (Whole Numbers)

- Work with numbers up to 20



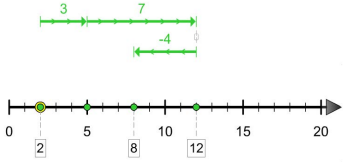
Learning Tool: Comparison Tool (Whole Numbers)

- Work with numbers to 1000



Learning Tool: Number Line

- Work with numbers to 1000

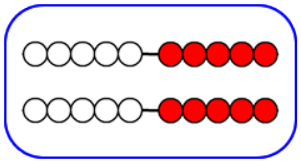


Learning Activities for Grade 3 with mathies.ca

Quantity: Whole Numbers to 100

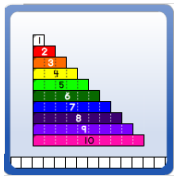
Learning Tool: Rekenrek

- Work with numbers to 1000, e.g., “What can you tell me about the number 55 when you look at it on the rekenrek? Sample answer: “It is eleven 5’s; It is 45 less than 100”
- This tool is available as an app at the Apple Store and Google Play




Learning Tool: Relational Rods

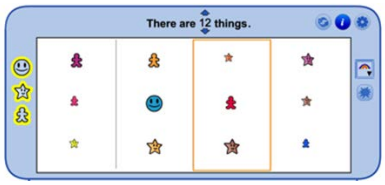
- Select the Whole Number Rod option
- Work with two-digit numbers, e.g., “Show me 25 in more than one way.”
- This tool is available as an app at the Apple Store and Google Play




Quantity: Fractions

Learning Tool: Set Tool

- Divide sets of objects into equal parts, e.g., Create a set of 25 items, and divide the items into five sets of five; Create a set of 16 items and divide the items into four sets of four, two sets of eight, eight sets of two, etc.
- This tool is available as an app at the Apple Store and Google Play

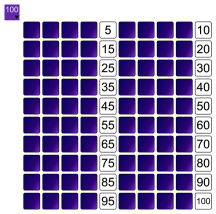


Learning Activities for Grade 3 with mathies.ca

Counting

Learning Tool: Number Chart

- Select the 100 chart option in the purple drop down menu
- Count by 1's, 2's, 5's, 10's, 25's, and 100's to 100, starting from various starting points, e.g., starting at 3 and counting by 2's, e.g., 3, 5, 7, 9, 11, …
- Count backwards by 2's, 5's, and 10's from 100, using multiples of 2, 5, and 10 as starting points



Money

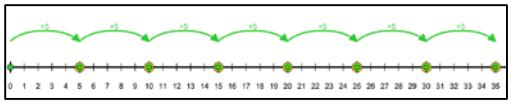
Learning Tool: Money

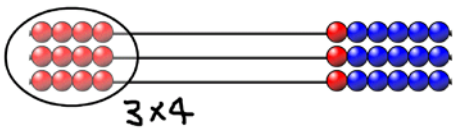
- Make change for simulated purchases up to $10
- Represent money amounts to $10
- This tool is available as an app at the Apple Store and Google Play

Operations

Learning Tool: Number Line, Rekenrek, Number Chart

- Solve problems involving three-digit addition and subtraction
- Multiply to 7 × 7 and divide to 49 ÷ 7, using a variety of strategies.



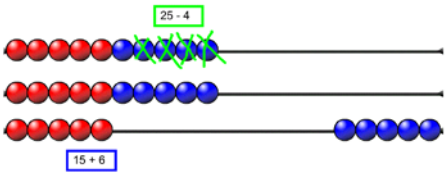


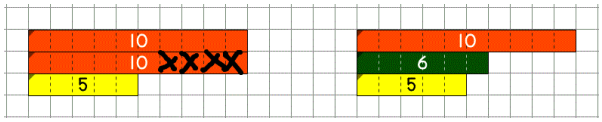
Learning Activities for Grade 3 with mathies.ca

Equality

Learning Tool: Rekenreks, Whole Number Rods

- Determine the missing number in equations involving addition and subtraction, e.g., 25 – 4 = 15 + ☐

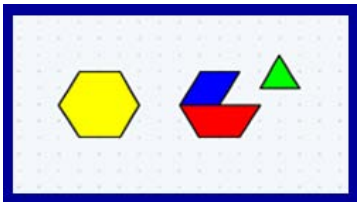




Geometry

Learning Tool: Pattern Blocks

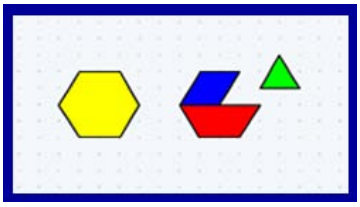
- Compose and decompose shapes
- Create designs that have vertical, horizontal, or diagonal symmetry
- Identify reflections, translations, and rotations
- Describe movement from one location to another using a grid



Patterning

Learning Tool: Pattern Blocks

- Create a repeating patterns involving two attributes (e.g., colour, shape)
- Demonstrate an understanding that patterns result by making a repeated change to an attribute (e.g., colour, orientation), e.g., show a pattern that results a change in orientation such as points up, points down, points up, points down, points up, points down, etc.

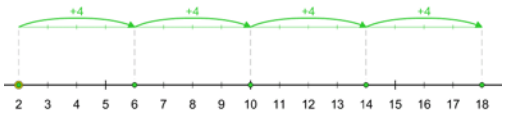


Learning Activities for Grade 3 with mathies.ca

Patterning

Learning Tool: Number Line

- Identify and describe number patterns involving addition, subtraction, and multiplication, represented on a number line, e.g., start at 2 and add 4 each time



Graphing

Learning Tool: Note Paper

- Create horizontal and vertical bar graphs