WINS
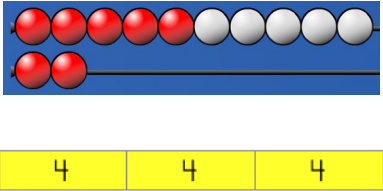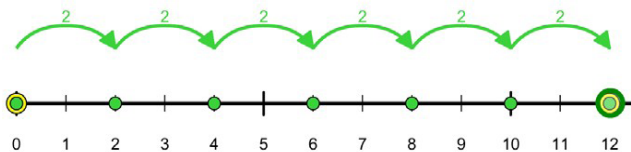
Mathematical Ideas

Representing whole numbers develops an understanding of number including its size and its relationship to other numbers.

Numbers can be represented in many ways. Each representation reveals different things about the number. For example:
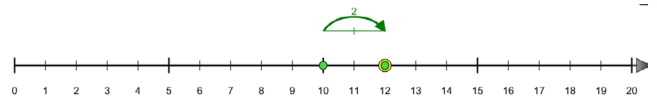
12		Twelve
Numerically	Pictorially or Concretely	In Words

Counting and mathematical operations may be strategies to represent numbers.
For example: Representing 12 on a number line

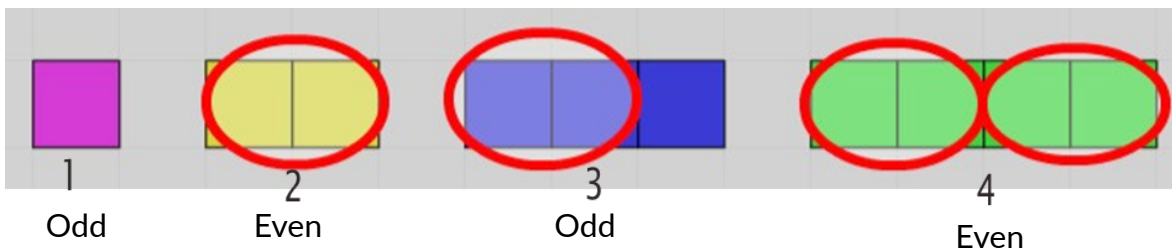Skip counting by twos   Adding 2 onto 10

Whole numbers are either even or odd. All even numbers are divisible by 2.

1	2	3	4
Odd	Even	Odd	Even

In our decimal number system, the value of a digit depends on its place, or position, in the number. Each place has a value of 10 times the place to its right.
For example, in the number 72:
- the digit 2 is in the ones place
- the digit 7 is in the tens place

Tips

- Learning tools are used to explore mathematical ideas and are a way for children to share their thinking. Encourage your child to take the time to use the learning tools for each activity.
- Organized concrete and visual representations can help with understanding numbers and the relationships between numbers.

For example,

Rack 1
Rack 2
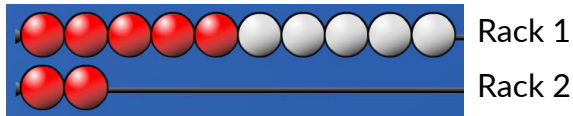
from this visual you can see that the representation of 12 beads is the same as:
- 7 red and 5 white beads or,
- 10 beads on the first rack and 2 beads on the second rack or,
- 5 red beads, 5 white beads and 2 more red beads.

Mathematical Words/Symbols

Digits – are the numerals 0 to 9 that form numbers. For example, the digits 2 and 7 can form the two-digit numbers 27 and 72.

Mathematical operations – most common are addition, subtraction, multiplication, and division.

Place value – the value of any digit depending on its location in a number e.g., for the number 84 the place value of the 8 is 80.

Skip counting – usually means counting forward or backwards by numbers other than 1, such as by twos (2, 4, 6, 8).

Sum – the result of addition

Materials

Activity 1:
- Set Tool
- Representation Cards

Activity 2:
- Whole Number
- Representation Cards

Activity 3:
- Colour Tiles
- Number Cards

Activity 4:
- Rekenrek
- Bead Cards

Activity 5:
- Money
- Number Cards

Activity 6:
- Catch a Bouncing Ball – Representations (Whole Numbers) Game

Set Tool
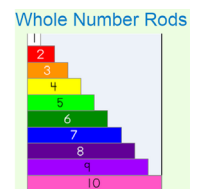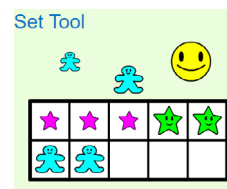
Whole Number Rods

Colour Tiles
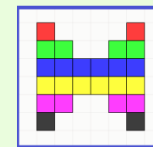
Rekenrek
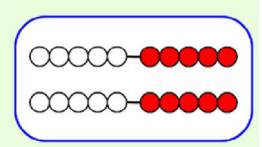
Money
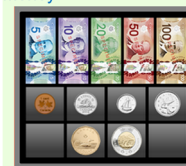
Catch a Bouncing Ball - Representations (Whole Numbers)

Learning Tools and Games can be accessed at mathies.ca
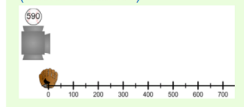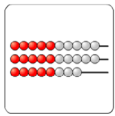
Representing Numbers Using the Set Tool

Set Up for the Activity:
- Open the Set learning tool.
  - » use the create mode (default)
- Shuffle one set of cards showing 20 to 50 and place them face down in a pile. Use the Representation Cards (tallies, numerals, beads).

How to Do the Activity:
1. Ask your child to draw a card and tell you the number that is represented.
2. Have your child show you that quantity using one shape from the set tool.
   - » have your child organize this quantity using ten-frames
3. Ask your child to show the same quantity using two shapes.
4. Have your child show the same quantity using any combination of attributes (shape, colour, size, face).
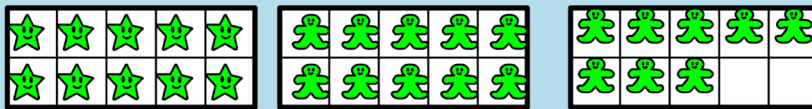5. Clear the workspace using the recycle icon.
6. Repeat as desired.

Example:

Your child may represent twenty-eight by creating groups of ten then 5 and then adding 3

28 using one shape

28 using two shapes

28 using mixed attributes

Let's Talk About It

How did you know how many objects you needed to show?
Why is it okay to use different representations for the same number?
How does the ten-frame help you know the number of objects?

Representing Numbers Using Whole Number Rods

Set Up for the Activity:
- Open the Whole Number Rods learning tool.
- Shuffle one set of cards showing 20 to 50 and place them face down in a pile. Use the Representation Cards (10-frames, tallies, numerals, beads).

How to Do the Activity:
1. Ask your child to pick a card and identify the quantity shown.
2. Have your child represent this number using the Whole Number Rods aligned horizontally to form a train.
3. Leave this representation on the workspace and then ask your child to show other trains that represent this number.
4. Have your child use the unit train to check and see if the number trains are the same.
5. Clear the workspace using the recycle bin 🗑 and repeat the activity as desired.

Example:

HHH HHH
HHH HHH
HHH HHH
HHH III
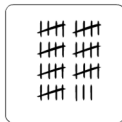
Your child may look for ways to make ten and then add 8 in various ways.
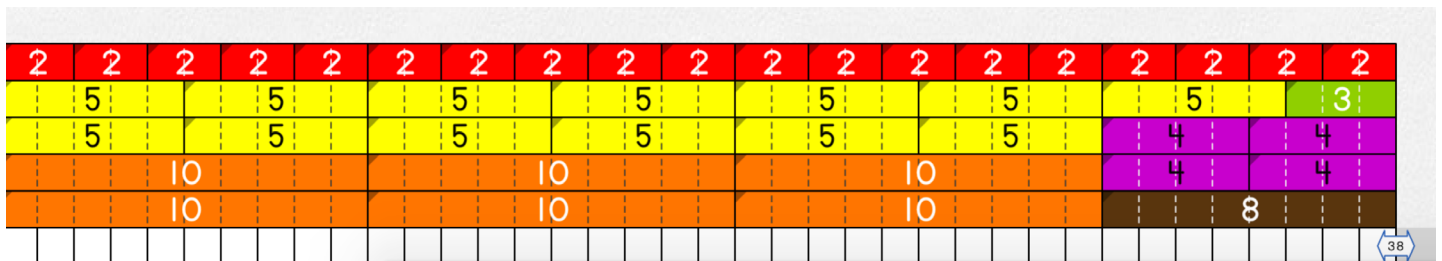
Unit Train

Let's Talk About It

What strategies did you use to represent your numbers?
Which representation makes it easiest to see the number?
Which representation makes it more challenging to recognize what is represented?
How does the unit train help us check the rods?

Representing Number Using Colour Tiles

Set Up for the Activity:
- Open Colour Tiles learning tool.
- Shuffle two sets of number cards 1 to 4 and place face down on the table. These will be the tens digits.
- Shuffle one set of number cards 0 to 9 and place face down on the table. These will be the ones digits.

How to Do the Activity:
1. Have your child pick one card from each pile and create a 2-digit number.
2. Represent the target number using one colour of tiles.
3. Represent the target number using two colours of tiles.
4. Represent the target number using three colours.
5. Ask your child what strategy was used for each of the representations. You may wish to make note of this using the annotation tool.

Example:

4   8   Target Number

$5 \times 10 - 2 = 48$

$40 + 8 = 48$

$20 + 20 + 8 = 48$
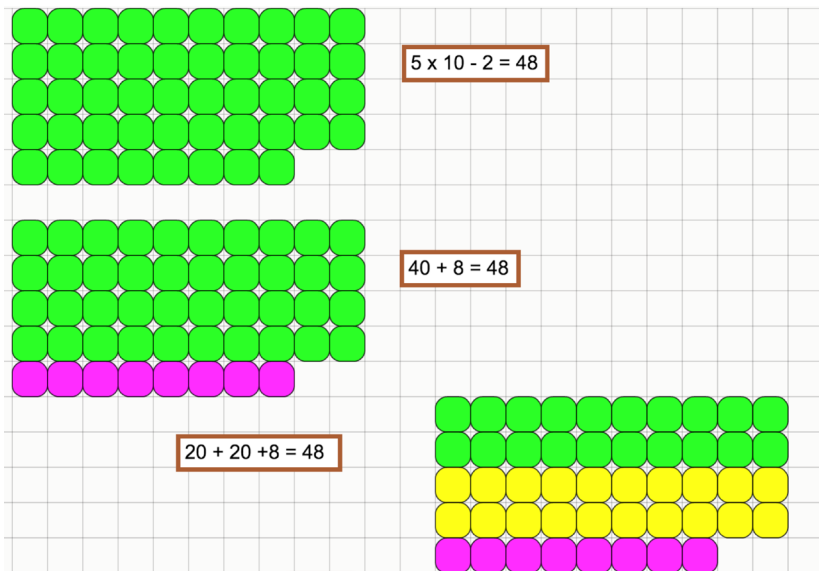
Your child may use the multiplier to drag out combinations of tiles.

Let's Talk About It

Which representation did you find easiest to create?

How do you know that each of your representations shows the target number?

If you had a fourth colour, how do you think your strategy for representing the target number would change?

Representing Using the Rekenrek

Set Up for the Activity:
- Open the Rekenrek learning tool.
  - » add racks until there are 5 racks on the workspace
- Shuffle one set of bead cards (12 to 25) and place face down in a pile.

How to Do the Activity:
1. Ask your child to pick 2 bead cards from the pile and determine the number of beads altogether.
2. Have your child replicate the information from the cards to the Rekenrek tool.
3. Reorganize the beads so that they are on the fewest racks possible and have your child verify the number represented.
4. Repeat as desired.

Example:
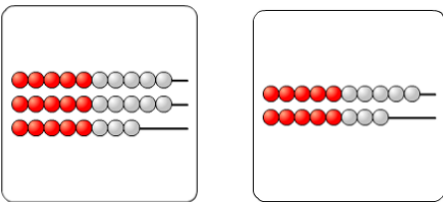
Number represented is 46.
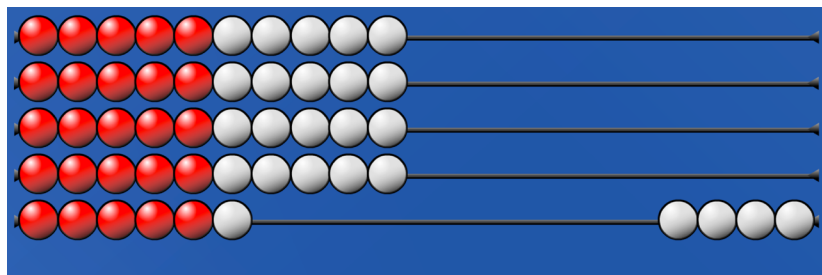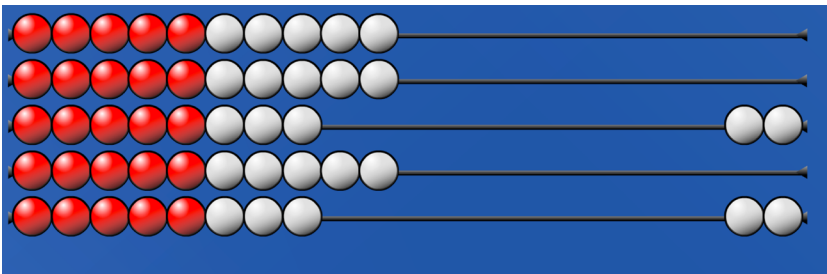
Your child may have counted tens and then counted the ones to determine the represented value.

Let's Talk About It

What strategies did you use to determine the number represented by the cards?

What strategies did you use to reorganize the beads on the Rekenrek tool?

How could you use a strategy from reorganizing the Rekenrek tool to find out what was represented on the cards?

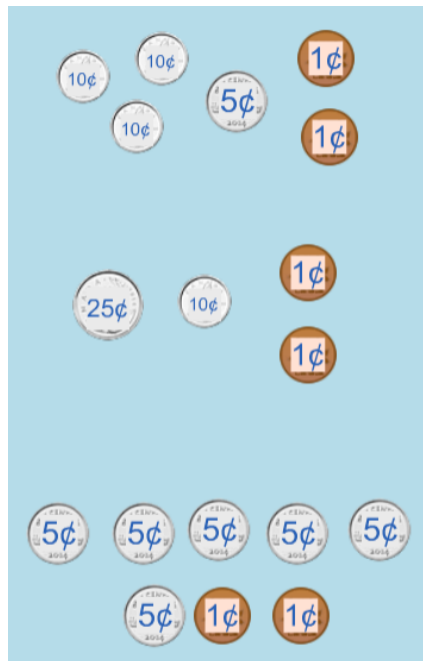# Representing Number to 50

Representing Numbers Using Money

Set Up for the Activity:
- Open Money learning tool.
  - » Customize to only show the 1 cent, nickel, dime, and quarter.
- Shuffle one set of number cards 1 to 4 and place them face down in a pile. This card represents the tens digit.
- Shuffle one set of number cards 0 to 9 and place them face down in a second pile. This card represents the ones digit.

How to Do the Activity:
1. Have your child pick one card from each pile and create a 2-digit number.
2. Represent this number using the coins in more than one way.

Example:

Your child may think of the number in terms of 10s , 5s, and 1s.

Let's Talk About It

Have you represented the number as many ways as possible? How do you know?
If your number is 6 more, what will you need to do to your representation?

Representing Number to 50

Catch a Bouncing Ball

Set Up for the Game: Number of Players: 1
- Open the Catch a Bouncing Ball – Representations (Whole Numbers) game.
  - » Select 0 to 50.

How to Play the Game:
1. A representation of a number will be shown on the pitching machine.
2. Move the glove to the location on the number line that matches the representation.
3. Ten representations will be given in each game.
4. Review the game at the end to see the correct placements of the representations.

Example:

> Your child may identify 20 on the number line and then count on by 1s to place the glove at 23.
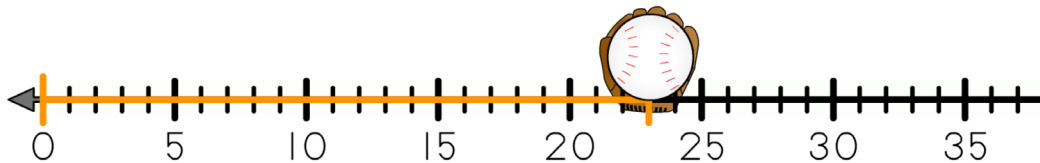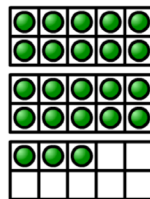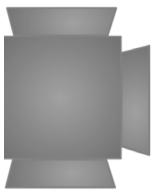
Let's Talk About It

Which number representations do you find the most difficult to place on the number line? What type of number line do you find easier to work with, the horizontal or vertical? Why?