Situations Involving Multiplication and Division with Products to 50

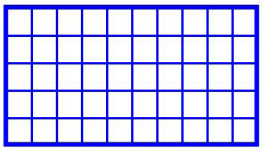
Mathematical Ideas

Composing, decomposing, addition, and subtraction of numbers are foundations of multiplication and division.

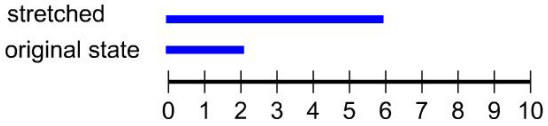
The following are examples of situations that involve multiplication and/or division:

1. **Groups of Equal Quantity** – involves a number of equal-sized groups and the total
   Examples:
   - There are 6 cookies on each tray. If there are 4 trays, how many cookies are there altogether?
   - Twenty-four cookies were baked. If each tray holds 6 cookies how many trays were needed?
   - Twenty-four cookies were baked. If 4 trays were used with the same number of cookies on each tray how many cookies were on each tray?

2. **Product or Quotient of Measures** – involves a multiplication or division of two measures
   Examples:
   - A rectangle is 5 cm by 10 cm. What is the area of the rectangle?
   - The area of the rectangle is 50 centimetres squared. If the length of the rectangle is 10 cm what is the width of the rectangle?
   - The area of the rectangle is 50 centimetres squared. If the width of the rectangle is 5 cm what is the length of the rectangle?



3. **Scale Factor** – involves a multiplicative comparison that relates an original quantity to a scaled quantity
   Examples:
   - An elastic band is 2 cm long before it is stretched. The band's length tripled. What is the length of the elastic band now?
   - A stretched elastic band is 6 cm in length. Before it was stretched the length measured 2 cm. How many times greater is the elastic band's length now?
   - A stretched elastic band is 6 cm in length. The band is 3 times its original length. What was the original length of the elastic band?



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Mathematical Ideas

4. **Combinations** – involves a total number of combinations of two or more types of things
   Examples:
   - There are 4 different colours of shirts and 2 different sleeve lengths. How many different possible combinations are there?
   - There are 8 different possible combinations of colour and sleeve length. If there are 4 different colours how many different sleeve lengths are there?
   - There are 8 different possible combinations of colour and sleeve length. If there 2 different sleeve lengths how many different colours are there?

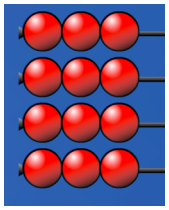
	Colour 1	Colour 2	Colour 3	Colour 4
Length A	A1	A2	A3	A4
Length B	B1	B2	B3	B4

Helpful Information

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 tools for each activity.
- Organized concrete and visual representations allow your child to use spatial sense to deepen understanding of number and the relationships between numbers.

For example,
This array shows four equal groups of 3 horizontally and three equal groups of 4 vertically.



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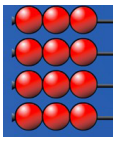
Helpful Information

Mathematical Words/Symbols

Array- is a set of objects, symbols, or numbers organized in rows and columns.



Expression – is a mathematical phrase that involves numbers and operation symbols. For example, 4 x 3 is a multiplication expression.
Factor – a number that divides exactly into another number. For example, 6 is a factor of 12.

Product – the result of multiplying. For example, 6 is the product of 2 x 3.
Quotient - the result of dividing. For example, 6 is the quotient of 24 ÷ 4

X multiplication symbol
÷ division symbol

6 ÷ 2 without context can be interpreted as:
- 6 divided into 2 groups
- 6 is made up of groups of 2

3 x 2 has many interpretations including:
- three times two
- three, two times
- three groups of two

Materials

Activity 1:
- Set Tool

Activity 2:
- Set Tool

Activity 3:
- Whole Number Rods
- Number Cards

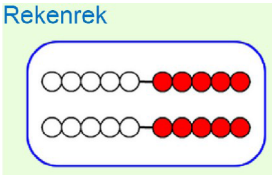
Activity 4:
- Whole Number Rods

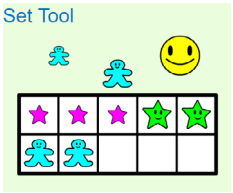
Activity 5:
- Colour Tiles
- Number Cards

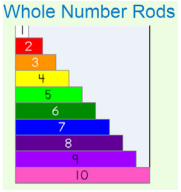
Activity 6:
- Colour Tiles

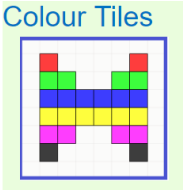
Activity 7:
- Notepad
- Number Cards

Activity 8:
- Notepad









Equal Groups of Objects

Activity 1

Set Up for the Activity:

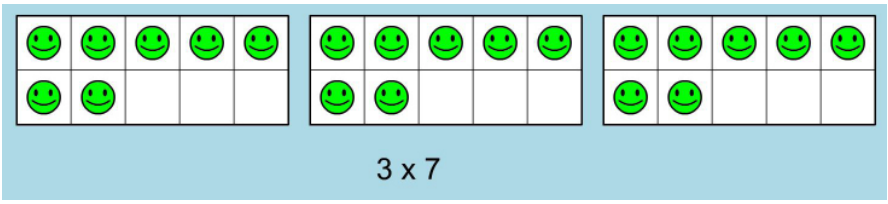
- Open the Set learning tool
  - » ensure the tool is in create mode
- Shuffle two sets of number cards 1 to 7 and place them face down in a pile.

How to Play the Activity:

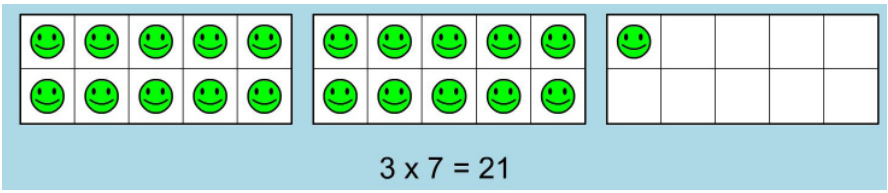
1. Have your child pick one card and place that number of objects in a 10-frame.
2. Have your child pick a second card and make copies of the original 10-frame until the number of 10-frames matches the card.
3. Have your child write an expression to record the action of multiplying.
4. Have your child determine how many objects are on the workspace.
5. Repeat several times.

Example:

7	7 objects in a 10-frame
3	3 copies



determining the product of 3 x 7



Your child may rearrange the groups of objects to determine the product.

Let's Talk About It

How did you determine the product?
How would the product change if you had one more (less) object in each group?
How would the product change if you had one more group?

Dividing Sets of Objects

Activity 2

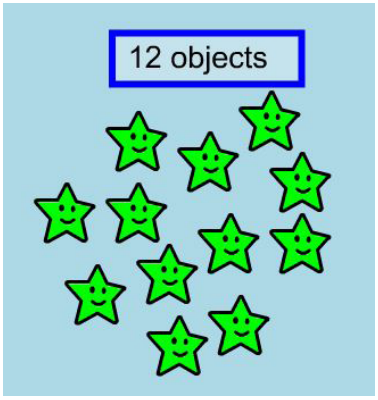
Set Up for the Activity:

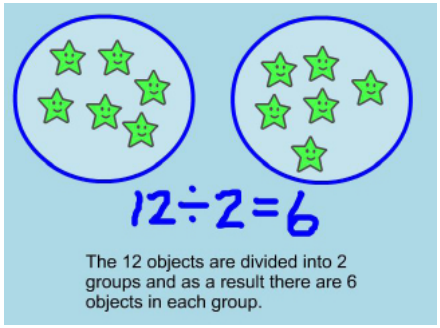
- Open the Set learning tool.
  - » ensure the tool is in create mode

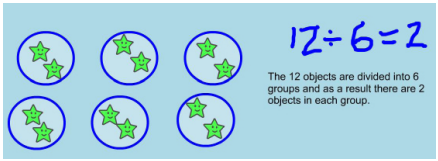
How to Do the Activity:

1. Pick a number between 10 and 49.
2. Have your child represent this number using the same object.
3. Ask your child to determine if the set of objects can be divided equally among groups of 7 or less.
4. Have your child write a division equation to represent the action of dividing the objects into equal-sized groups in step 3. Ask your child to interpret the division equation.
5. Have your child determine if the total number of objects can be divided up in another way.
6. Have your child write the division equations for any of the ones found in step 5. Ask your child to interpret each division equation.
7. Repeat activity as desired.

Example:







Your child may notice that the number of groups and the number of objects in a group can be switched to show another way to divide the objects equally.

Let's Talk About It

What strategies did you use to determine if there is more than one way to divide the objects into equal-sized groups?
What types of numbers would remain as one group of objects? What would its division equation be?

Scaled Whole Number Rods

Activity 3

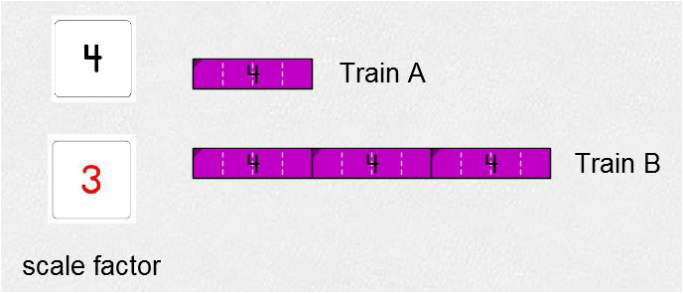
Set Up for the Activity:

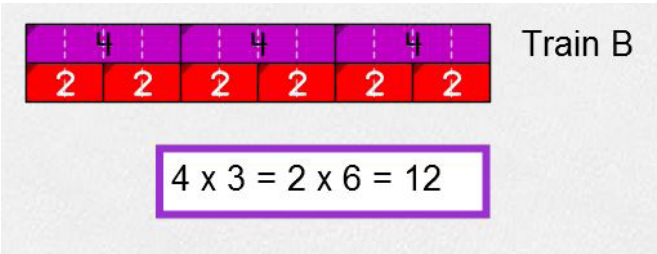
- Open the Whole Number learning tool.
- Shuffle fours sets of number cards 1 to 7 and place them face down in a pile.

How to Do the Activity:

1. Have your child pick a card from the pile.
2. Have your child move the rod that represents that card onto the workspace. Annotate as Train A.
3. Have your child pick a new card from the pile. This card represents the number of times greater Train B will be then Train A. This is called the scale factor.
4. Ask your child to predict the length of Train B.
5. Have your child verify the length of Train B by creating it.
6. Have your child write the multiplication equation and any steps used in determining the product (length of Train B).
7. Repeat the activity at least three times.

Example:





Your child may replace each 4-rod with a 2-rod and see that 4 x 3 is the same as 2 x 6 and use the known facts of 2 to determine the length of the train.

Let's Talk About It

What is another way to find out the length of Train B?

Dividing Scaled Trains

Activity 4

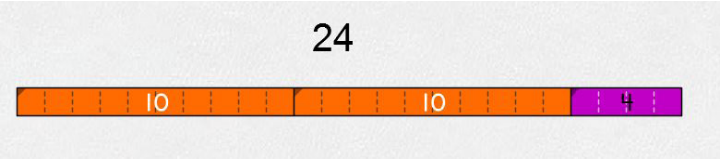
Set Up for the Activity:

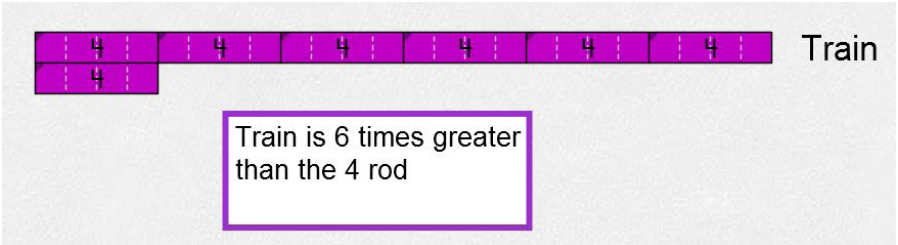
- Open the Whole Number Rod learning tool.
- Create a recording chart using the headings indicated in the example.

How to Do the Activity:

1. Have your child pick a number less than 50.
2. Ask your child to represent this number using the whole number rods forming a train.
3. Have your child re-represent the number using only one colour of rods from 1 to 7.
4. Ask your child to describe how many times greater the train is compared to the rod. This is the scale factor.
5. Ask your child to state the division equation that can be used to determine the scale factor.
6. Record on recording chart.
7. Repeat activity at least three more times.

Example:





Length of Train	Length of Rod	Scale Factor	Division Equation
24	4	6	24 ÷ 4 = 6

Your child may use repeat subtraction to determine the scale factor.

Let's Talk About It

What would have been the length of the train be if the scale factor was one more? Is there another same colour rod that could have been used? What would its division equation be?

Area of Rectangles

Activity 5

Set Up for the Game:

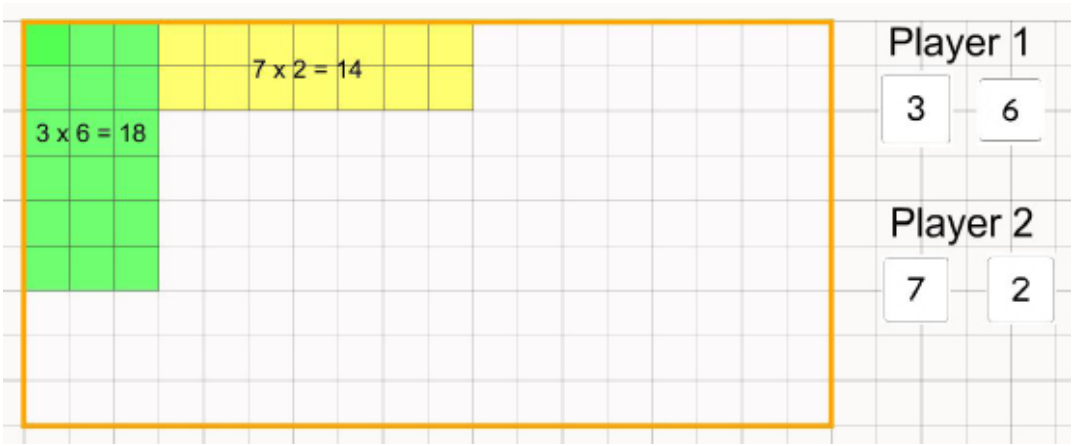
Number of Players: 2

- Open the Colour Tiles learning tool.
  - » Create a large rectangle using the annotation tool.
- Shuffle four sets of number cards 1 to 7 and place them face down in a pile.

How to Play the Game:

1. Decide who goes first.
2. Players take turns:
   - » picking two cards from the pile
   - » creating a rectangle using colour tiles with the dimensions noted on the two cards
   - » placing these tiles in the empty space in the large drawn rectangle
   - » writing a multiplication equation for the area of their rectangle created by the tiles
3. When the pile of cards is finished, or there are no more moves possible, the players find the sum of their products. The player with the greatest sum wins the game.

Example:



Your child may notice that the order of writing the multiplication statement in the equation does not matter. This is the commutative property.

Let's Talk About It

Does it matter which order we multiply the numbers together? Why or why not?
What strategies did you use to determine the area of your rectangles?

Rectangle Measures

Activity 6

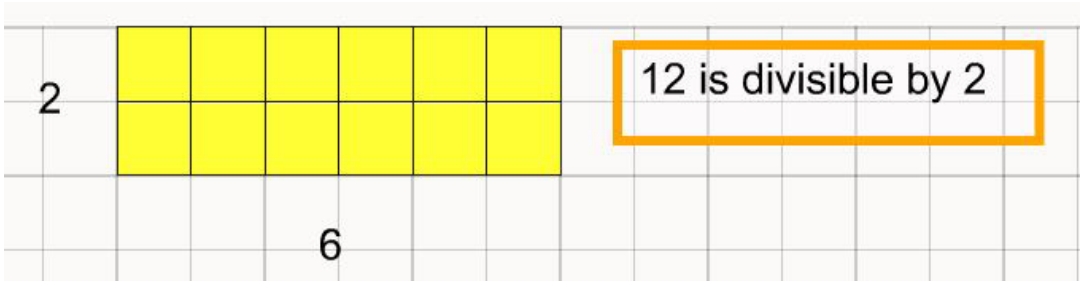
Set Up for the Activity:

- Open the Colour Tiles learning tool.
- Create a recording chart with headings identified in the example.

How to Do the Activity:

1. Have your child pick a number less than 50 that is divisible by 7 or less.
2. Have your child verify the number by creating a rectangle using colour tiles with the width of its divisor.
3. Ask your child to identify the length of the rectangle.
4. Have your child write the multiplication equation that determines the area of the rectangle.
5. Have your child write the division equation such that the result is the width of the rectangle.
6. Have your child write the division equation such that the result is the length of the rectangle.
7. Repeat activity as desired.

Example:



Your child may use trial and error to find a number other than 1 that will divide evenly.

Multiplication Equation	Division Equation 1	Division Equation 2
2 x 6 = 12	12 ÷ 2 = 6	12 ÷ 6 = 2

Let's Talk About It

Why are there two division equations when we only have one multiplication equation for each rectangle?
Can you create a rectangle with different dimensions that has the same area? What would its dimensions be? What would the division equations be?

Combining Shapes and Colours

Activity 7

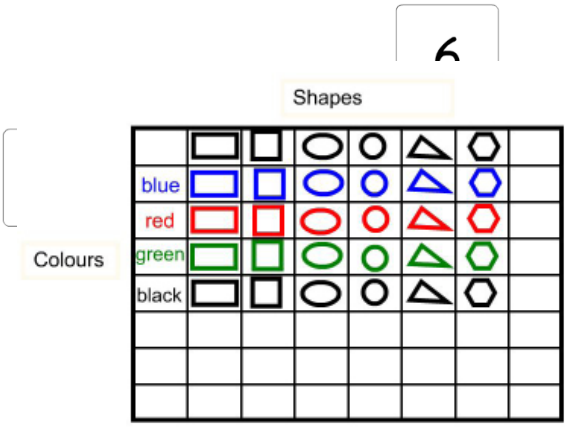
Set Up for the Activity:

- Open the Notepad learning tool.
  - » insert a table with 8 columns and 8 rows (not all columns and rows may be used in the activity) label the columns Shapes and the rows Colours (see example)
- Shuffle two sets of number cards 1 to 7 and place them face down in a pile.
- Create a recording chart with headings as indicated in the example.

How to Do the Activity:

1. Have your child pick a number card. This card represents the number of different colours that will be used.
2. Have your child pick a second number card. This card represents the number of different shapes that will be used.
3. Have your child fill in one colour for each row until the number of colours matches the card.
4. Have your child place one shape for each column until the number of shapes matches the card.
5. Ask your child to predict how many different combinations can be created.
6. Have your child check the prediction by filling in the grid creating combinations of colours and shapes.
7. Complete the recording chart.
8. Repeat the activity as desired.

Example:



Number of colours	Number of shapes	Number of Combinations	Multiplication equation
4	6	24	4 x 6 = 24

Your child may complete two rows, count the shapes and then double to find the final product

Let's Talk About It

How did you determine the product?
What would the product be if you had one more shape? One fewer colour?

How many Colours?

Activity 8

Set Up for the Activity:

- Open the Notepad learning tool.
- Create a recording chart with headings identifed in the example.
- Using the information from the Combinations Chart, pick one of the Number of Shapes and select one of its corresponding Number of Combinations.
- Record this information on the recording chart.

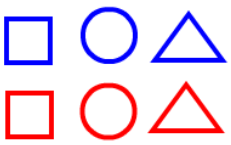
Number of Shapes	Number of Combinations
2	2,4,6,8,10,12,14
3	3,6,9,12,15,18,21
4	4,8,12,16,20,24,28
5	5,10,15,20,25,30,35
6	6,12,18,24,30,36,42
7	7,14,21,28,35,42,49

How to Do the Activity:

1. Tell your child the total number of combinations of colours and shapes. Record in the chart.
2. Tell your child the number of shapes. Record in the chart.
3. Have your child use the annotation tool on the Notepad to determine the number of colours needed to create that many combinations.
4. Have your child write the division equations in the chart such that the result is the number of colours.
5. Repeat activity at least three more times.

Example:

12 combinations
3 shapes
? colours



3 shapes of 1 colour 3 combinations
3 shapes of 2 colours 6 combinations
3 shapes of 3 colours 9 combinations
3 shapes of 4 colours 12 combinations

Number of Combinations	Number of Shapes	Number of Colours
12	3	12 ÷ 3 = 4

Your child may use the pattern that 3 shapes are created for each colour and continue the pattern for 12 combinations.

Let's Talk About It

How did you determine the number of colours?
How many combinations would you have if you had one more shape?