

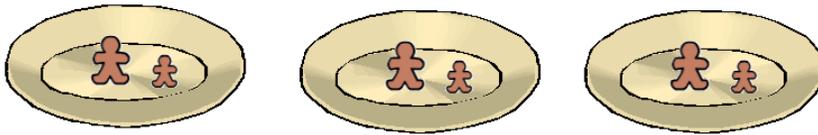


Exploring Multiplication

Mathematical Ideas

Composing, decomposing, and addition of numbers are foundations of multiplication. One way to think of multiplication is combining groups of equal size.

For example: There are 2 cookies on each plate. If there are 3 plates, how many cookies are there altogether?



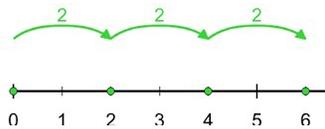
Three groups of two cookies make six cookies.

Examples of strategies for multiplication:

2×3 can be determined by:

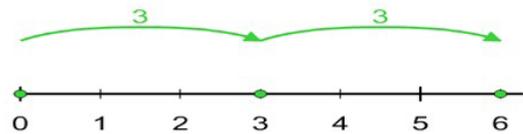
- Skip Counting

skip counting by twos three times
2, 4, 6



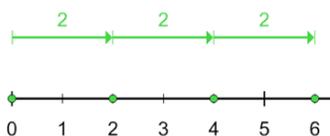
or

skip counting by threes two times
3, 6



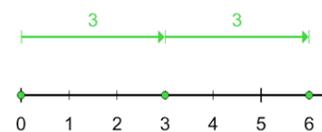
- Repeat Addition

adding three twos
 $2 + 2 + 2$



or

adding two threes
 $3 + 3$





Exploring Multiplication

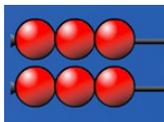
Helpful Information

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.

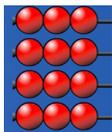
For example,

This array is organized as two racks of three beads and can be seen as 3 twos vertically or 2 threes horizontally.



Mathematical Words/Symbols

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



Product – is the result of multiplying. For example, 6 is the product of 2×3 .

X multiplication symbol

3×2 has many interpretations including:

- three times two
- three, two times
- three groups of two

Materials

Activity 1:

- Rekenrek
- Number Cards

Activity 2:

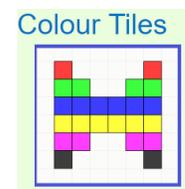
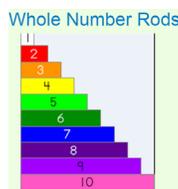
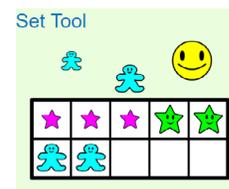
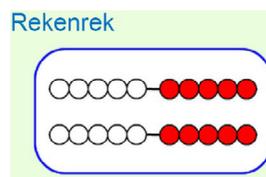
- Set Tool

Activity 3:

- Whole Number Rods

Activity 4:

- Colour Tiles
- Dice cards
- Number Cards





Exploring Multiplication

Exploring Multiplication as Groups of Beads

Activity 1

Set Up for the Activity:

- Open the Rekenrek learning tool
 - » Show 5 racks of beads with the beads on the right side of the tool.
- Shuffle one set of number cards 2 to 5 and place them face down in a pile.
- Create a chart with the headings as shown in the example using the annotation tool.

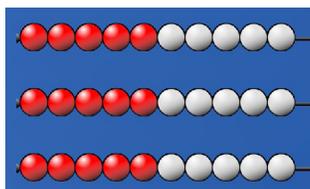
How to Play the Activity:

1. Have your child pick a card from the pile. Ask your child to record this number under the 'number of groups' column on the chart.
2. Have your child show this many groups of 10 beads using the Rekenrek tool.
3. Ask your child how many beads altogether. Record on the chart.
4. Clear the Rekenrek and repeat activity until all cards have been used.
5. Repeat steps 1 to 4 using 5 beads.

Example:

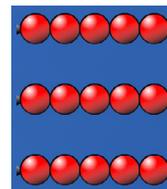
3

Three groups of 10



30 Beads

Three groups of 5



15 Beads

Number of Groups	Number of Beads in 1 Group	Total
3	10	30

Your child may skip count by fives or tens to determine the total number of beads.

Let's Talk About It

If you know how many beads are in three groups of ten, how can this help you know how many beads are in four groups of ten?

If you know how many beads are in four groups of five, how can this help you know how many beads are in three groups of five?

Imagine you have 6 groups of 10. How many beads will there be? How many beads would there be if the six groups each had 5 beads? How do you know?



Exploring Multiplication

Exploring Multiplication as Sets of Equal Size

Activity 2

Set Up for the Activity:

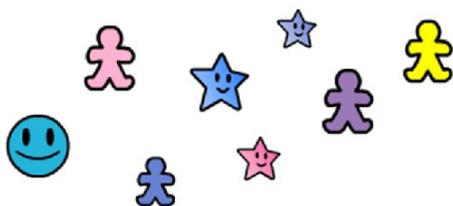
- Open the Set learning tool.
 - » Select Auto Mode
 - » Adjust the number of objects to an even number, 20 or less.
 - » Close the panel to hide the number.
- Create a chart as shown in the example using the annotation tool.

How to Do the Activity:

1. Have your child place the objects into groups of two.
2. Ask your child how many groups were made.
3. Have your child tell you the total number of objects on the workspace.
4. Have your child record the information on the chart.
5. Reshuffle the objects in the workspace using the  button.
6. Ask your child to place the objects into two groups of equal amounts.
7. Have your child tell you how many objects are in each group.
8. Have your child tell you the total number of objects on the workspace.
9. Have your child record the information on the chart.
10. Repeat activity as desired.

Example: 8

Objects shown in the workspace.



Objects placed into groups of two.



4 groups of 2 objects.

Your child may count by 2s to determine the total number of objects

Objects placed into two groups of equal amounts.



2 groups of 4 objects.

Number of Groups	Number of Objects in a Group	Total
	2	
2		

Let's Talk About It

If you have 7 objects can you make two equal groups? What will you have to change to make two equal groups? How do you know?
 What numbers can't be made into two equal groups?
 What patterns do you see on your record sheet?



Exploring Multiplication

Exploring Multiplication of 2, 5, and 10 using Rods

Activity 3

Set Up for the Activity:

- Open the Whole Number Rods learning tool.
- Shuffle one set of number cards 1 to 5 and place them face down in a pile.

How to Do the Activity:

1. Have your child pick a number card from the pile.
2. Have your child place this number of 2-rods into the workspace and form a train.
3. Have your child place the same number of 5-rods into the workspace and form a second train.
4. Have your child place the same number of 10-rods into the workspace and form a third train.
5. How long are the trains?
6. Ask your child to describe patterns between the 2-rod train, 5-rod train, and 10-rod train.
7. Clear the workspace, pick a new card and repeat #2 to #6.

Example:

3

Three rods of each type



6 Units Long Train



15 Units Long



30 Units Long

Your child may use skip counting to determine the length of each train.

Let's Talk About It

If you double the length of the 2-rod train, will it be longer, shorter, or the same as the 5-rod train? How do you know?

What will happen if you double the length of the 5-rod train? Will it be longer, shorter, or the same as the 10-rod train? How do you know?



Exploring Multiplication

Exploring Multiplication Using Groups of Tiles on a Grid

Activity 4

Set Up for the Game:

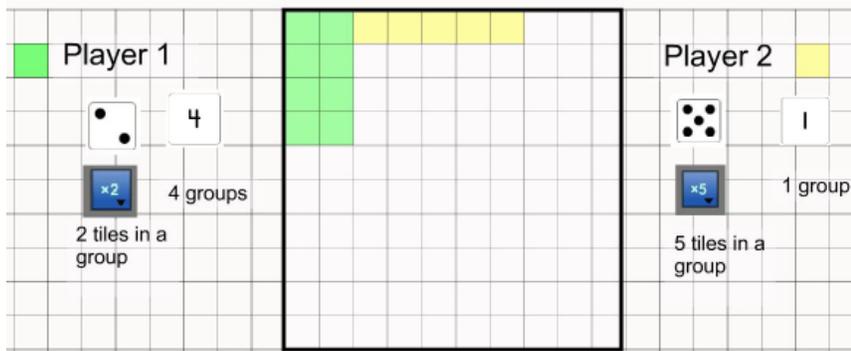
Number of Players: 2 to 3

- Open the Colour Tiles learning tool.
 - » Use the annotation tool to draw a 10 by 10 square on the workspace to be the game board.
- Shuffle one set of dice cards 1, 2, and 5 and scatter them face down on the table. This quantity represents the number of tiles in a group.
- Shuffle three sets of number cards 0 to 6 and place them face down in a pile. This number represents the number of groups.

How to Play the Game:

1. Player 1 picks a dice card and selects that multiplier on the panel to set the number of tiles in a group.
2. Player 1 picks a number card and moves this number of groups of tiles onto the game board using one colour of tile.
3. The dice card is placed back on the table and the cards are scattered again.
4. Player 2 repeats steps one to three using a different coloured tile.
5. Play continues until the number cards are gone or the game board is filled.
6. The player with the greatest number of tiles on the board wins the game.

Example:



Your child may see that 4 rows of 2 is the same as 2 columns of 4.

Let's Talk About It

How did you decide where to put your groups?

If you had four groups of five what are the different ways you could place them on the board?

When can groups of two give you more tiles than groups of five?