

Unit 2:

Conceptual Understanding of Multiplication

During Unit 2 students will develop an understanding of multiplication by participating in many hands-on activities. Students will learn to interpret the language of multiplication, act out multiplication situations and record their multiplication experiences.

Examples of the language of multiplication:

- Rows of
- Groups of
- Stacks of
- Piles of

Conceptual Understanding of Division

Students will also develop an understanding of division by participating in many hands-on activities. Students will learn to interpret the language of division, act out division situations and record their division experiences. Students will be able to determine when the answer refers to the *number of groups*, versus the *number in each group*.

Examples of the language of division: (dividing quantities into)

- Rows
- Groups
- Stacks
- Piles

UNIT 2 GOALS

- Understand 5×7 as 5 groups of 7 objects, 5 rows of 7 objects, 5 stacks of 7 objects, etc.
- Understand $56 \div 8$ as 56 objects are equally sorted into 8 groups or 56 objects are sorted into groups of 8.
- Use multiplication and division within 100 to solve word problems.
- Tell and write time to the nearest minute.

Acting Out Multiplication Stories:

Students are presented with story problems such as:

Tim had three dogs. He gave each dog two bones. How many bones did he give all his dogs?

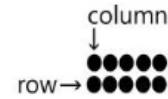
Students will use counters to show how many bones Tim gave his dogs.



VOCABULARY

Unit 2

Array – repeated rows of numbers or objects



Multiply – an operation showing how many times a number is added to itself

Equal groups – same number of objects in each group

Factor – number of groups and the number in each group

Equation – a statement that two expressions are equal, for example $5 \times 4 = 20$

Divide – separate into equal groups



Writing Multiplication Phrases:

To help students make connections to written symbols, students first learn to record their experiences using words.

When presented with the problem:

Misty stacks books into two piles. She puts four books in each pile. How many books are there altogether?



Students will record: **2 stacks of 4 books = 8 books**

The multiplication symbol and the word *times* will not be introduced until after students have had the opportunity to develop an understanding of multiplication. Introducing these ideas too soon may interfere with their ability to think about the situation presented.

When the multiplication symbol is introduced, students will be guided to use the appropriate phrase that matches a given situation when reading the problem.

Example: *Maria's father was making pancakes for three people. He stacked four pancakes on each plate. How many pancakes did he make?*



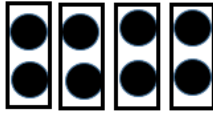
Write $3 \times 4 = 12$; **Say** 3 stacks of 4 = 12

Acting Out Division Stories:

Students are presented with story problems such as:

There are eight bottles of glue. Each table of children will get two bottles. How many tables will get glue?

This story could be acted out using glue bottles and tables in the classroom. Students could also use counters to model the eight bottles of glue and strips of paper to model the tables. The students will find there are four tables with two bottles of glue on each table.

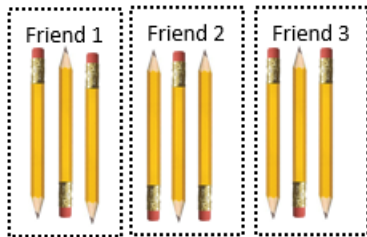


In the story above, the students know how many objects there will be in each group. They have to find how many groups there will be.

Students are presented with story problems such as:

Lorenzo has nine pencils. He is going to divide the pencils among three of his friends. How many pencils will each friend get?

Students could act this story problem out with nine pencils. They will find that each of his friends will get 3 pencils.



In the story above, the students know how many groups of pencils they need, they have to find how many pencils there will be in each group.

Introducing the division process using symbols:

When the students can interpret the language of division with ease, they are introduced to the division symbol (\div). Students will continue to relate each division problem to a story problem.

Example:

For the problem $8 \div 2 = 4$, students could tell the following division stories:

- Jerry got eight books. He gave two books to as many people as he could. How many people got two books?
(Finding the total number of groups.)

Four people got two books each.



- Jerry got eight new books. He is putting them away on two shelves. He puts the same number of books on each shelf. How many books did he put on each shelf?
(Finding the total number in each group.)

Two shelves with four books on each shelf.



Multiplication and Division Together:

When the students are comfortable with both multiplication and division situations, they will begin to work with both processes in the same activity.

Students will be randomly presented with both multiplication and division story problems. They are to use counters to represent the objects in the stories and write the equation that describes the action. For each story, the students will identify the appropriate process, multiplication or division.

Examples:

Sam had three packs of gum. Each pack had six pieces of gum in it. How many pieces of gum did Sam have?

- How did you figure out the answer?
- Did you multiply or divide?

Nori's mom bought 24 treats for the party. There were 8 children at the party. How many treats could each child get?

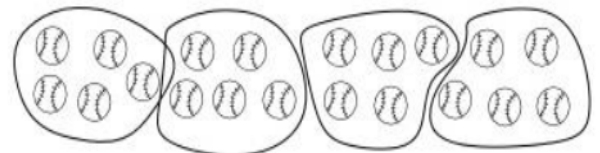
- How did you figure out the answer?
- Did you multiply or divide?



Students will begin to make connections between multiplication and division as shown in the examples below:

Tracy puts 20 baseballs into bags. Each bag holds 5 balls.

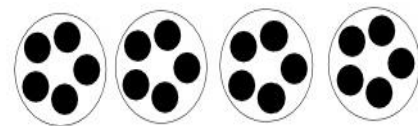
Circle the groups of 5 to show the balls in each bag.



Tracy needs 4 bags. $4 \times 5 = 20$ $20 \div 5 = \underline{4}$

The numbers in the blank represent the number of groups.

Tracy uses 20 baseballs to make 4 equal groups. Draw to show how many baseballs are in each group.



There are 5 baseballs in each group.

$4 \times \underline{5} = 20$ $20 \div 4 = \underline{5}$

The numbers in the blank represent the number in each group.

