

ACTIVITY 3A

MULTIPLICATION AND DIVISION

MATERIALS

20 cans of vegetables or fruits (use books as alternative)
fresh vegetables and fruit (use counting chips as alternative)
links
Student Pages 1-5

EXPLORING THE CONCEPT - MULTIPLICATION AND DIVISION

LESSON

WHAT I AM TO DO

1. Stack cans so that there are three stacks with four in each stack and one left over.

Write: $3(4) + 1$

Finish writing the above sentence:

$$3(4) + 1 = \square$$

NOTE: The sentence form is ...

$$\underline{\hspace{2cm}} (\underline{\hspace{2cm}}) + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

number of groups number in each group leftovers (remainder) total

FOR YOUR INFORMATION: There are three reasons that this format is used. First, it seems to be the closest symbolic representation to the actual objects — much more so than the symbol 'x' or the word 'times'. The more conventional terminology and symbol will be introduced into Activity 3M. Second, this format is the same as used in algebra and is called the 'y-intercept form of a linear equation'. Because your child will have used this form quite extensively this part of algebra will not seem as foreign. Finally, as much as possible math should be seen as a whole — not simply parts. Using algebraic notation to learn the multiplication and division facts will teach your child that math has a certain unity not simply unrelated parts.

WHAT I AM TO SAY

"HOW MANY STACKS ARE THERE?"

"HOW MANY CANS ARE IN EACH STACK?"

"HOW MANY ARE LEFT OVER?"

"I AM WRITING A MATH SENTENCE ABOUT THE CANS I HAVE STACKED. IT IS READ **THREE GROUPS OF FOUR PLUS ONE LEFT OVER.**"

"AT THIS POINT DO WE KNOW THE TOTAL NUMBER OF CANS?"

(ANSWER: NO)

"THE BOX REPRESENTS WHAT YOU DO NOT KNOW AND IS READ **SOMETHING.**"

"WHAT DOES THE MATH SENTENCE SAY?"

(ANSWER: THREE GROUPS OF FOUR PLUS ONE EQUALS SOMETHING)

"HOW MANY CANS ARE THERE?"

"WRITE THE NUMBER THAT REPRESENTS THE TOTAL NUMBER OF CANS IN THE BOX."

(ANSWER: $3(4) + 1 = \boxed{13}$)

2. Show your child 18 cans.

"I HAVE 18 CANS AND I WANT TO PUT THEM IN STACKS OF 4 CANS. AT THIS POINT WHAT HAVE I TOLD YOU?"

(ANSWER: TOTAL OF 18 CANS AND STACKS OF 4)

"HAVE I TOLD YOU THE NUMBER OF STACKS OR THE NUMBER OF LEFT-OVERS?"

(ANSWER: NO)

"WHAT DOES THE SENTENCE SAY?"

(ANSWER: SOME GROUPS OF FOUR PLUS SOMETHING EQUALS 18)

"NOW I WANT YOU TO STACK THE CANS AND FILL IN THE BOXES?"

"HOW MANY GROUPS/STACKS DID YOU MAKE?"

(ANSWER: 4)

"HOW MANY IN EACH STACK?"

(ANSWER: 4)

"HOW MANY LEFT OVER?"

(ANSWER: 2)

"HOW MANY CANS ARE THERE ALTOGETHER?"

(ANSWER: 18)

Write: $\square(4) + \square = 18$

3. Show your child 20 cans.

"I HAVE 20 CANS AND I WANT TO PUT THEM ON FIVE SHELVES. WHAT HAVE I TOLD YOU?"

(ANSWER: TOTAL OF 20 CANS AND 5 GROUPS)

"WHAT DIDN'T I TELL YOU?"

(ANSWER: THE NUMBER OF CANS ON EACH SHELF AND THE LEFTOVERS)

DOES THIS MATH SENTENCE DESCRIBE THE PROBLEM? WHAT DOES IT SAY?"

"USING THE CANS FIND OUT HOW MANY WILL BE ON EACH SHELF?"

"HOW MANY WERE LEFT OVER?"

"FILL IN THE BOXES IN THE MATH SENTENCE."

(ANSWER: $5(\underline{4}) + \underline{0} = 20$)

Write: $5(\square) + \square = 20$

The following problems involve stories of fresh fruit and vegetables. Let me encourage you to use the real items if at all possible; however, if they are not available substitute counting chips.

"FOR EACH OF THE FOLLOWING PROBLEMS I WANT YOU TO FIRST WRITE THE MATH SENTENCE (A SENTENCE WITH A BOX) AND THEN USE THE OBJECTS TO HELP YOU SOLVE IT."

4. Give your child 13 tomatoes, and 3 paper sacks or containers.

"PLEASE PACK THE TOMATOES IN THESE THREE SACKS."

"WHAT DO YOU KNOW AND WHAT DON'T YOU KNOW?"

(ANSWER: **KNOWN:** TOTAL OF 13 TOMATOES AND 3 GROUPS; **UNKNOWN:** THE NUMBER OF TOMATOES IN EACH SACK AND THE NUMBER LEFT OVER.)

"WRITE A MATH SENTENCE TO DESCRIBE THE STORY."

(ANSWER: $3 \square + \square = 13$)

"SOLVE THE PROBLEM USING THE OBJECTS."

"HOW MANY TOMATOES ARE IN EACH SACK?"

(ANSWER: 4)

"HOW MANY TOMATOES ARE LEFT OVER?"

(ANSWER: 1)

"FILL IN THE BOXES."

(ANSWER: $3 \square(4) + \square(1) = 13$

5. Give your child 17 strawberries.
Have some sacks available.

"PLEASE PUT THESE STRAWBERRIES INTO SACKS. PUT 8 IN EACH SACK."

"HOW MANY SACKS DID THE PROBLEM SAY?"

(ANSWER: IT DID NOT SAY)

"HOW MANY STRAWBERRIES WERE TO BE PUT INTO EACH SACK?"

(ANSWER: 8)

"HOW MANY LEFTOVERS DID I SAY?"

(ANSWER: IT DID NOT SAY)

"HOW MANY STRAWBERRIES DID I GIVE YOU?"

(ANSWER: 17)

"WRITE A MATH SENTENCE TO DESCRIBE THE STORY."

(ANSWER: $\square(8) + \square = 17$)

"USE THE OBJECTS TO FIND THE SOLUTION AND WRITE THE NUMBERS IN THE BOXES."

(ANSWER: $\boxed{2}$ (8) + $\boxed{1}$ = 17)

"HOW MANY SACKS DO YOU HAVE?"

(ANSWER: 2)

"HOW MANY IN EACH SACK?"

(ANSWER: 8)

"HOW MANY LEFT OVER?"

(ANSWER: 1)

"HOW MANY ARE THERE ALTOGETHER?"

(ANSWER: 17)

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6. Give your child five sacks. Have available 21 oranges — do not have your child count the oranges.

"I AM GIVING YOU FIVE SACKS AND SOME ORANGES. DO NOT COUNT THE ORANGES. YOU ARE TO PUT FOUR ORANGES IN EACH SACK AND KEEP ONE ORANGE OUT."

"WHAT DO YOU KNOW FROM THE STORY?"

(ANSWER: THERE ARE 5 SACKS,
4 ORANGES GO INTO EACH SACK,
THE NUMBER OF LEFT OVERS)

"WHAT DON'T YOU KNOW FROM THE STORY?"

(ANSWER: THE TOTAL NUMBER OF ORANGES)

"WRITE A MATH SENTENCE TO DESCRIBE THE STORY?"

(ANSWER: $5(4) + 1 = \square$)

"USE THE OBJECTS TO SOLVE THE PROBLEM?"

"WRITE THE SOLUTION IN THE BOX."

(ANSWER: $5(4) + 1 = \boxed{21}$)

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7. Give your child 13 links.

"YOU HAVE 13 LINKS."

"I WANT YOU TO PUT THEM TOGETHER SO THAT YOU HAVE THREE EQUAL CHAINS. YOU MAY HAVE SOME LEFT OVER."

"WRITE A MATH SENTENCE TO DESCRIBE THE PROBLEM."

(ANSWER: $3(\square) + \square = 13$)

"USE THE LINKS TO SOLVE THE PROBLEM. WRITE THE SOLUTIONS IN THE BOXES."

(ANSWER: $3(\boxed{4}) + \boxed{1} = 13$)

8. Make 4 chains with 2 links in each chain and none left over.
- "I HAVE FOUR CHAINS WITH TWO LINKS IN EACH CHAIN AND NONE LEFT OVER."
- "WRITE A MATH SENTENCE TO DESCRIBE THE OBJECTS."
- (ANSWER: $4(2) + 0 = \square$)
- "HOW MANY LINKS DO I HAVE?"
- "WRITE THE SOLUTION IN THE BOX."
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9. Have 16 links available.
- "I HAVE 16 LINKS. I WANT TO PUT THEM IN CHAINS OF SEVEN."
- "WHAT DO YOU KNOW?"
- (ANSWER: THE TOTAL NUMBER OF LINKS AND THE NUMBER OF LINKS PER CHAIN.)
- "WHAT DON'T YOU KNOW?"
- (ANSWER: THE NUMBER OF CHAINS THE NUMBER OF LEFT OVER.)
- "WRITE A MATH SENTENCE TO DESCRIBE THE PROBLEM."
- (ANSWER: $\square(7) + \square = 16$)
- "USE THE LINKS TO SOLVE THE PROBLEM AND WRITE THE SOLUTION IN THE BOXES."
- (ANSWER: $\square(7) + \square = 16$)
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10. Make six chains with three links in each chain. Have two left over.
- "I HAVE SIX CHAINS WITH THREE LINKS IN EACH CHAIN AND TWO LEFT OVER."
- "WRITE A MATH SENTENCE TO DESCRIBE THE PROBLEM."
- (ANSWER: $6(3) + 2 = \square$)
- "USE THE OBJECTS TO FIND THE SOLUTION. FILL IN THE BOX."
- (ANSWER: $6(3) + 2 = \square$)
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- *11. Give your child Student Page 1 and object to represent each of the problems.
- "WRITE A MATH SENTENCE ABOUT EACH STORY AND THEN SOLVE IT. YOU SHOULD USE OBJECTS TO HELP SOLVE THE PROBLEMS."
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- * 12. Give your child Student Pages 2 and 3. Encourage your child to use objects to solve each math sentence.
- "READ THE STORY. SELECT THE MATH SENTENCE THAT DESCRIBES THE STORY PROBLEM AND THEN SOLVE IT."
- *NOTE:
For STEPS 11 and 12 —
- "IF YOU NEED TO USE OBJECTS TO HELP SOLVE THE PROBLEM, FEEL FREE TO DO SO."

IMPORTANT!

As your child is completing Student Pages 1-3, ask the following questions ...

"WHAT DO YOU KNOW FROM THE STORY?"

"WHAT DON'T YOU KNOW FROM THE STORY?"

"HOW MANY GROUPS (ROWS, PILES, CARTONS, BAGS ,ETC.) DO YOU HAVE?"

"HOW MANY ARE IN EACH GROUP (ROW, PILE, CARTON, BAG, ETC.)?"

"HOW MANY ARE LEFT OVER?"

"HOW MANY ARE THERE ALTOGETHER?"

"SHOW ME HOW YOU WOULD DO THE STACKING (PACKING, BAGGING, PILING)?"

"WHAT DOES THE MATH SENTENCE TELL YOU?"

"DOES THIS SENTENCE REALLY TELL ABOUT THE PROBLEM?"

"WHAT NUMBER DO YOU WRITE IN THE BOX(ES)?"

13. Give your child Student Page 4.
Provide objects for your child to use if necessary.

"FILL IN EACH SECTION WITH THE NUMBER THE PROBLEMS SAYS. IF THE PROBLEM DOES NOT TELL THE NUMBER, PUT A '?' IN THAT BOX. THEN WRITE A MATH SENTENCE FOR EACH PROBLEM AND SOLVE IT."

14. Give your child Student Page 5.

"IN THE COLUMN 'I KNOW' CIRCLE THE INFORMATION THAT IS GIVEN IN THE PROBLEM. IN THE COLUMN 'I DO NOT KNOW' CIRCLE THE INFORMATION THAT IS NOT GIVEN."

"WRITE A MATH SENTENCE FOR EACH PROBLEM AND SOLVE IT."

ANSWER KEY**Student Page 1**

1. 4, 1
 $\boxed{4}(5) + \boxed{1} = 21$

2. 24
 $8(3) = \boxed{24}$

3. 3, 2
 $\boxed{5}(3) + \boxed{2} = 17$

4. 4, 2
 $\boxed{6}(4) + \boxed{2} = 26$

5. 28
 $3(8) + 4 = \boxed{28}$

6. 3, 0
 $\boxed{3}(9) + \boxed{0} = 27$

Student Page 2

1. 6, 0
 $30 = \square(5) + \square$

2. 22
 $4(5) + 2 = \square$

3. 5
 $3(\square) + \square = 17$

4. 6, 2
 $\square(4) + \square = 26$

Student Page 3

1. 22
 $3(7) + 1 = \square$

2. 2, 1
 $6(\square) + \square = 13$

3. 4, 3
 $\square(4) + \square = 19$

4. 11
 $5(2) + 1 = \square$

Student Page 4

1. 5, 4, 2, 22
 $5(4) + 2 = \boxed{22}$

2. 4, ?, ?, 27
 $4(\boxed{6}) + \boxed{3} = 27$

3. ?, 5, ?, 18
 $\boxed{3}(5) + \boxed{3} = 18$

4. 2, 8, 1, 17
 $2(8) + 1 = \boxed{17}$

Student Page 5

1. Know:
number of groups
number in each group
number left over
Not know:

total

$4(3) + 1 = \boxed{13}$

2. Know:
number in each group
number left over
total

Not know:
number of groups

$\boxed{6}(3) + 1 = 19$

3. Know:
number of groups
number in each group
total

Not know
number left over
 $6(5) + \boxed{2} = 32$