**Literature Vocabulary**
savanna
habitat
weather
lightning
burrows
shrubs

**Math Vocabulary**
factors
products
multiplication
division
fact family
area model
array model

**Materials**
- Portion cups – 12 per student
- 1 sheet dark construction paper
- Base ten units – 60 per student
- **BLM TM** – Multiple Ways to Multiply from TM Lesson

***Time Clue***
**BB** = 1 minutes
**CI** = 26 minutes
**AC** = **1** minute

**ELPS** (*English Language Proficiency Standards*)
1D, 1G, 2D, 2I, 3C, 3E, 3I

**CCRS** *(College and Career Readiness Standards)*
**ELA**
IV.A.3; IV.B.1,2,3; I.B.1; I.C.1; *II.D.1,2;*
**Math**
VIII.A.1,2,3,4,5; VII.B.1,2; VIII.C.1,3; IX.C.1,2,3.
**Cross-Disciplinary**
I.D.1,2,3,4; I.E.1,2.

**Classroom Teachers**
Please circulate the room to see that students are not having difficulty representing the problems.

# Unit 2, Lesson 1 3-4

## TV Lesson

*Read objectives while pointing to the words in the math lesson objectives. After each math objective, show children what that means.*

### Math Objectives:
- Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, array and area models, equal jumps on a number line and skip counting.
- Model factors and products using area and array models.
- Represent multiplication and division situations in pictures, word and number form.

### Language Objectives:
- Use the math vocabulary during the activity.
- Discuss solution strategies.

### Building Background, Math
Multiplication is a great short cut! I'm sure you've already touched on multiplication during your regular school, but it's an important skill, so we're going to look at it in many different ways during this unit. You've already looked at repeated addition as another representation, and your Classroom Teacher introduced you to two more representations when she talked about the cookies and chocolate chips: same-sized sets and arrays. We'll work on all of those representations today, and we'll see what multiplication word problems look like, too.
Ok, let's get started.

### Comprehensible Input
I'd like to know your Classroom Teacher's baker friend. I'll bet those are great chocolate chip cookies. We're going to see just how she could use repeated addition, same-sized sets and the array model to figure out how many chocolate chips and how many cookies she has in her batches.

Let's look at your materials. These portion cups will represent the cookies. The base ten units will represent our chocolate chips, and the piece of construction paper will be our baking pan – it's just a way to keep our batches together. Let's work together now, please.

Let's say that the baker was trying out a new recipe and decided to bake a test batch of six cookies. When you bake cookies, you usually place the dough in tidy rows and columns with enough room for the dough to spread out during baking. Let's make two rows of three cookies. (*Do so, putting the portion cups in a 2 x 3 array on the construction paper "cookie sheet."*)

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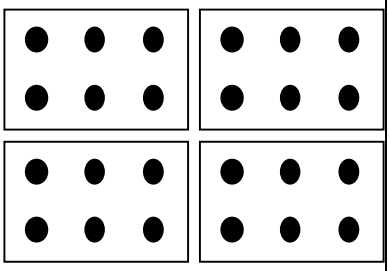
|---|---|
| **SMART BOARD**<br>Collect data on the board, but use the real materials for the cookie demo. | **Unit 2, Lesson 1** **3-4**<br>  <br>**TV Lesson** - continued<br><br>Ok, give it a little time and the cookies bake *(ding – sound of timer)*; time to take out the cookies. *(Just leave the materials where they are.)*<br><br>The baker places the chocolate chips in the cookies NOW. Let's say she wants to push five chips into each of the warm cookies. (*Count and drop 1, 2, 3, 4, 5 unit cubes into each portion cup.)*<br><br>The question is, how many chocolate chips did she use? First, think of the Math Movie in your mind – Tell your classroom teacher what you are seeing boys and girls? You may use your models to explain, too *(pause).*<br><br>**PIRATE**: Well, I see six cookies on a cookie sheet. And I see five big yummy chocolate chips pushed into each warm cookie!<br><br>**TEACHER**: Excellent math movie, Capt. Portio. Did you see that too, boys and girls?<br><br>Let's write than in the problem column on our record sheet.<br>The cookies are our groups – so we have six groups.<br>And there are five chocolate chips in each group.<br>The problem then is<br>six groups of five chips (*write in the problem column*).<br><br>How can you figure that one out? Tell your teacher what you would do to figure the number of chips the baker used. *(pause)*<br><br>**PIRATE:** Well, we could use repeated addition. That would be<br>5 + 5 + 5+ 5+ 5+ 5=.<br>Hmm, I can skip count by 5s six times *(do so to 30 using fingers to keep track of the six cookies).*<br><br>**TEACHER**: That's certainly a way, Capt. Portio. And we know that we could use a multiplication number sentence 6 groups of 5 translates to<br>6 x 5 which we now know equals 30. So 6 x 5 = 30. Remember that you have two FACTORS and one PRODUCT. Circle the factors in the number sentence, and underline the PRODUCT. Six and six are factors. 30 is the product of the two factors<br><br>We have also created "same-sized" sets with our chocolate chips. We can draw a picture of those same-sized sets. What would you draw, boys and girls? Tell your Classroom Teacher. *(pause)* |

**TEACHERS:**
All problems generate a MATH MOVIE. We are not talking joining or separating. We are talking about the images that appear in our minds when we read a word problem. No matter what type of problem you read, there is some sort of action taking place. Please encourage students to see that action.





## TV Lesson - continued

**PIRATE:** I see, I could draw five little circles in one set, then draw that set a total of six times like this (*draw on the record sheet whether paper or Smart Board)*.

That gives me a picture of my Math Movie! Now I could count them one by one; or I could skip count by 5s; or if I know my multiplication tables, I can multiply 6 x 5. But the picture helps me see the number of chips and what the math movie is! There are still 30 chips (*count by 5s*).

**TEACHER**: Great job! Yes, we have just used another multiplication strategy, and that is to draw a picture of same-sized sets. And anytime you SEE a picture that has multiple sets of the same number in each set, you know you can multiply to find the answer!

Let's draw that picture on our record sheet in the "picture of same-sized sets" column (*do so*).

Now, suppose the baker had made four cookie sheets that looked exactly like this one (*refer back to the cookie sheet*). How many COOKIES would she have made?

First, what is our problem? What math movie do you see? Please tell your teacher what the problem is, or what math movie you see. Remember, the baker made FOUR cookie sheets that looked exactly like this one. (*pause*)

**PIRATE**: Well, I see four cookie sheets. On each sheet there are six cookies. So I would say the problem is four groups of six cookies.

**TEACHER**: Yes, that is the problem. There are four groups, or cookie sheets, with six cookies each. Let's write that on our record sheet. (*Write four groups of six cookies in problem column*).

We could represent that with repeated addition. 6+6+6+6. That's not so easy to skip count if you don't know your sixes. Let's record the repeat addition, and we'll leave the answer for a bit.

We could use our multiplication sentence. 4 x 6.
Hmm, but if you don't know your times tables, that could be a problem, too. So we only have the two factors here, don't we? Go ahead and circle the two FACTORS.

## Unit 2, Lesson 1 3-4

**TV Lesson** - continued

Look at the cookie sheet. What we have created is an ARRAY. We have arranged those cookies in rows and columns. We call that an ARRAY. We can draw our cookie sheet array four times in the array model column. You'll have to draw small, though, to fit them all in. *(do so)*

Each one of those cookie sheets is and ARRAY. In fact, each is a two by three array (*focus on one cookie sheet, tracing the two horizontal ROWS when you say two, and the three vertical columns when you say three*).

I've put the four cookie sheets together to make a really big array. How many rows are there in this big cookie sheet? Let's count them (*four, tracing each horizontal row*) and how many columns do we have? (*six, tracing each vertical column as you count*). We still have our four groups of six. And we can see that we have 24 cookies now. That is our PRODUCT. You may write 24 as the product in the multiplication sentence – be sure to underline it!

When you have a set of rows and columns that like we do with these cookies, and the things inside the set are not touching, then you have an ARRAY.

What other things come in an ARRAY?

**PIRATE:** Well, eggs in a carton seem like they come like that.

**SMART BOARD**
In modeling other things that come in arrays, you can certainly have the REAL objects, and just use that for the discussion of the rows and columns; or you can have photographs on the SMARTBOARD, using the board to trace the rows and columns.

*(Either the real thing and demo the dialog below with it, or show picture of eggs in a carton on Smart Board, then do all the following recording on the board, too.*)

Yes, they do. These eggs *(referring to picture or real eggs in carton)* are in a two (rows) by six (columns) array. Let's record this example.

- What would our problem be for this egg carton? *(two groups of six)*
- And if we wrote that as repeated addition, what would we write? 6 + 6 = 12.
- What about a multiplication number sentence?
  Two groups of six is 2 x 6 = 12. FACTORS? PRODUCT?
- And we said this can be represented as an array. Let's draw this array *(do so).*

Can you think of something else you buy that might come in an array? Boys and Girls, can you tell your teacher something else that might come in an array? *(pause)*

**Classroom Teachers:**
You may need to complete the array investigation during the follow-up lesson. Please follow the same format that the TV Teacher has used to finish if necessary before the actual Follow-up practice.

**PIRATE Corner**
**Unit 2 Lesson 1 - CGI**
Tell us all the different strategies used today to solve your CGI problem. Share your class posters if you can.

## Unit 2, Lesson 1 3-4

## TV Lesson - continued

**PIRATE:** How about a six pack of soda? They would be an array.

**TEACHER:** Yes, a six pack of soda is also arranged in an array. *(Draw it, or show real six pack of soda.)*
Let's record that example:

- What is our problem? two groups of three
- How would you represent that as repeated addition? 3 + 3 = 6
- The multiplication sentence? 2 x 3 = 6 FACTOR? PRODUCT?
- Let's draw this array (*do so in the array model column*).

**PIRATE:** Oh, and I gave my Mom a box of chocolates. They were arranged in an array, too!

**TEACHER**: (*Real box of chocolates or photograph on SMART BOARD*) Yes, this box certainly is an array – it is a rectangular shape, and the candies inside are arranged in rows and columns. Take a close look at this array, boys and girls.

- What would be the problem if you are trying to figure how many candies are in this box? (*depends on the candy box*)
- Repeated addition number sentence?
- What about a multiplication sentence? *(create)* FACTORS? PRODUCT?
- And our array model?

There are many ways to represent multiplication, boys and girls. Can you name the ones we've worked with during this lesson? (*pause, then repeated addition, same-sized sets, array model, multiplication sentence*)

**PIRATE:** Well, and you used multiplication today during your Daily Routines. Where? In the CGI. *(Explain task.)*

**TEACHER:** Thank you! What kind of strategy did you use, boys and girls – we can't wait to see your posters and read your descriptions!

**Objectives:** And now before we go, let's review what we have learned today! *(do so)*

**BLM Unit 2, Lesson 1**
(One page per student)

**Multiple Ways to Multiply**

| **Problem/*Problema*** | **Repeated Addition** *Adición repetida* | **Multiplication** *Multiplicación* | **Picture of Same-sized Sets** *Modelo de sets del mismo tamaño* | **Array Model** *Modelo de matriz* |
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