



Solve Multiplication Problems



Purpose In this activity, students learn to represent mult

- Teacher-facilitated w/ Small Student Groups
- Small Group

Digital add-on available with book purchase.



Setting Up For Instruction

- Prepare **Equal Groups, Repeated Addition, & Arrays Example** (PG. 44) so that it can be projected using your classroom technology.
- Make 1 copy of **Equal Groups, Repeated Addition, & Arrays Example** for each student.
- Choose problems from **A Problem for Every Multiplication Fact** (PG. 23–36) so that each pair of students has a different problem to practice. Do not use the 0 facts problems at this time.
- Make 6 copies of **Equal Groups, Repeated Addition,**

**Differentiation is simple with over 100 problems to choose from!
This book is also available in English.**

Option: Print 1 copy per student and laminate it or put it in a sheet protector for use with dry erase markers.

- Write the journal question on the board: How are equal groups, arrays, and repeated addition related?
- Other materials:
 - Colored pencils:** 1 pack per pair of students
 - Centimeter cubes:** approximately 100 per pair of students
 - Sticky notes:** 1 per student
 - (Optional) **Sheet protectors:** 1 per student
 - (Optional) **Dry erase markers:** 1 per student



Thought Extenders

Equal Groups

- Can you make a model/draw a picture to show your thinking?
- How many are in each group?
- How many groups do you have?
- What is the total number?

Arrays

- How many are in each row?
- How many rows do you have?
- How many are in each column?
- How many columns do you have?
- What is the product?

Repeated Addition

- What number is being added?
- How many times should it be added?

Connecting Equal Groups and Arrays

- How are equal groups and arrays alike?
- How are equal groups and repeated addition alike?
- How are arrays and repeated addition alike?

Side-by-side Thought Extender Questions in Spanish & English.

Preguntas para ampliar el conocimiento

Grupos iguales

- ¿Puedes hacer un modelo/hacer un dibujo para mostrar tus ideas?
- ¿Cuántos hay en cada grupo?
- ¿Cuántos grupos tienes?
- ¿Cuál es el número total?

Matrices

- ¿Cuántos hay en cada hilera?
- ¿Cuántas hileras tienes?
- ¿Cuántos hay en cada columna?
- ¿Cuántas columnas tienes?
- ¿Cuál es el producto?

Suma repetida

- ¿Qué número se está sumando?
- ¿Cuántas veces se debe sumar?

Conexión entre grupos iguales, matrices y suma repetida

- ¿En que se parecen los grupos iguales y las matrices?
- ¿En que se parecen los grupos iguales y la suma repetida?
- ¿En que se parecen las matrices y la suma repetida?





How-To Guide

CONNECT EQUAL GROUPS & REPEATED ADDITION

Goal: Model multiplication using equal groups and connect the model to repeated addition

- Put students in pairs and hand out the **Equal Groups, Repeated Addition, & Arrays Example, colored pencils, and centimeter cubes**.
- Project **Equal Groups, Repeated Addition, & Arrays Example**. Read the problem together.

- ☞ What is the problem asking you to find? *The total number of turtles*
 - ☞ Work with students to fill in the blanks. What operation do you use to solve the problem? How do you know? *Multiplication; there are 4 groups with 3 in each group*
- Have students model the problem using **centimeter cubes**.

- ☞ ¿Qué te está pidiendo el problema que encuentres? *El número total de tortugas*
- ☞ Trabaje con los estudiantes para completar los espacios en blanco. ¿Qué operación utilizas para resolver el problema? ¿Cómo lo sabes? *Multiplicación; hay 4 grupos con 3 en cada grupo*

Then discuss and draw the models. *¿Cuántas tortugas en total? 12*

- How can you write this using addition? $3 + 3 + 3 + 3 = 12$

CONNECT EQUAL GROUPS & ARRAYS

Goal: Organize equal groups into arrays to model multiplication

- Look at your model.
 - ☞ How can you organize it into a rectangle so that it shows 4 groups with 3 in each group? *Make 4 rows with 3 in each row*
 - ☞ How many are in each row? What does this represent in the problem? *3; the number of turtles on each log*
 - ☞ How many rows are there? What does this represent in the problem? *4; the number of logs*
 - ☞ How could you color the boxes in the array to show your model? *Color in 4 rows with 3 boxes in each row.*

- ☞ ¿Cómo puedes organizarlo en un rectángulo para que muestre 4 grupos con 3 en cada grupo? *Hacer 4 hileras con 3 en cada hilera*
- ☞ ¿Cuántos hay en cada hilera? ¿Qué representa esto en el problema? *3; el número de tortugas en cada tronco*
- ☞ ¿Cuántas hileras hay? ¿Qué representa esto en el problema? *4; el número de troncos*
- ☞ ¿Cómo podrías colorear las cajas de la matriz para mostrar el modelo? *Colorear 4 hileras con 3 cajas en cada hilera.*

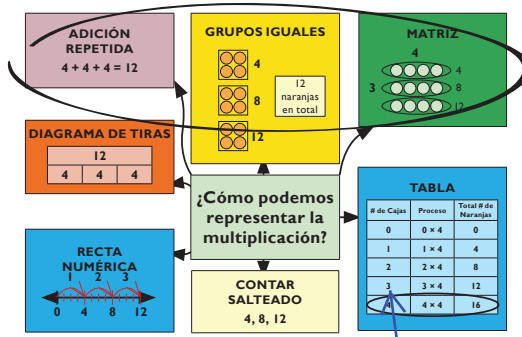
- Have students color each row a different color so that the equal groups are visible. Then fill in the blanks.
- Have students write the answer to the problem in a complete sentence.

Note: You may want to do a second example prior to students working in small groups.

WRAP IT UP

Goal: Solidify the difference between multiplication and division

- Work with students to create an anchor chart as shown with equal groups, repeated addition, and arrays. The next 3 activities will add information to the same anchor chart.



- Hand out **Equal Groups, Repeated Addition, & Arrays Practice Template** and one problem to each pair of students. Have students work together to fill out the template. When a pair is finished, have them trade problems with another pair until they have solved 6 different problems.
- Hand out **sticky notes**. Ask students to discuss the journal question and then write their own thoughts on the sticky note.

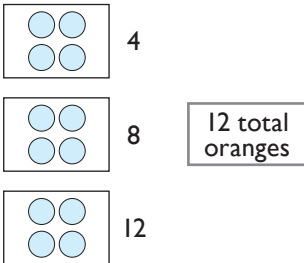
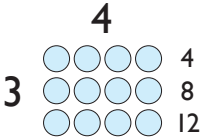


Modeling Multiplication Using Equal Groups, Repeated Addition, & Arrays

Take the following problem:

Je'Von has 3 crates of oranges, and each crate holds 4 oranges. How many oranges does Je'Von have?

To the experienced math teacher, this is clearly a multiplication situation: 3 groups of 4 oranges equals 12 total oranges. But the state standards emphasize that students must be able to represent this problem in a variety of ways. Let's look at how this problem could be modeled using equal groups, repeated addition, and arrays, as well as how these representations are connected.

<p style="text-align: center;">WORD PROBLEM/EQUATION</p> <p>Je'Von has 3 crates of oranges, and each crate holds 4 oranges. How many oranges does Je'Von have?</p> <p style="text-align: center;">$3 \times 4 = 12$</p>	<p style="text-align: center;">EQUAL GROUPS</p> 
<p style="text-align: center;">REPEATED ADDITION</p> <p style="text-align: center;">$4 + 4 + 4 = 12$</p>	<p style="text-align: center;">ARRAY</p> 

When exploring these three models, encourage students to look at how they are similar and how they are different. A few things you might lead students to notice if they don't identify them on their own:

- Each model shows 3 equal groups of 4.
- Each model equals 12 total objects.
- Equal groups and arrays both show 3 equal groups of 4 using objects, but the array model uses rows and columns.
- Even though it's not introduced in this activity, students may make the connection between these models and skip counting by 4.
- Repeated addition uses only numbers and no pictures or objects.



GRUPOS IGUALES, SUMA REPETIDA Y MATRICES EJEMPLO

CLAVE DE RESPUESTAS

Instrucciones: crea un modelo para resolver el problema. Dibuja el modelo y una matriz. Después completa la tabla a continuación.

Había 4 troncos tirados junto al estanque. 3 tortugas se subieron en cada tronco para tomar el sol.
¿Cuántas tortugas había en los troncos?

Escriba la oración numérica de multiplicación.

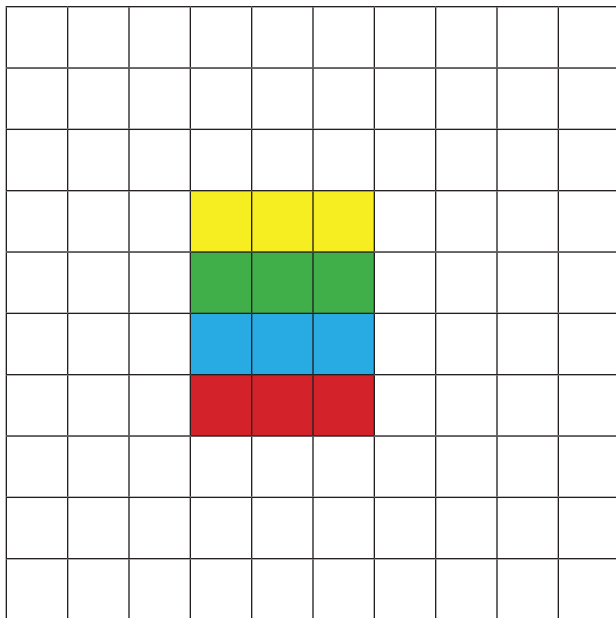
$$4 \times 3 = 12$$

Completa los espacios en blanco. Luego dibuja un modelo que demuestre grupos iguales.

___ 4 ___ grupos de ___ 3 tortugas ___ = Total



Haz una matriz que corresponda con el modelo.



___ 4 ___ hileras de ___ 3 ___ = ___ 12 ___

___ 4 ___ × ___ 3 ___ = ___ 12 ___

Resuelve usando suma repetida.

$$3 + 3 + 3 + 3 = 12$$

Escribe tu respuesta en una oración completa.

Había 12 tortugas en los troncos.



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Había 4 troncos tirados junto al estanque. 3 tortugas se subieron en cada tronco para tomar el sol.
¿Cuántas tortugas había en los troncos?

Escriba la oración numérica de multiplicación.

Completa los espacios en blanco. Luego dibuja un modelo que demuestre grupos iguales.

_____ grupos de _____ = Total

Haz una matriz que corresponda con el modelo.

_____ hileras de _____ = _____

_____ × _____ = _____

Resuelve usando suma repetida.

Escribe tu respuesta en una oración completa.



Escribe el problema.

Escriba la oración numérica de multiplicación.

Completa los espacios en blanco. Luego dibuja un modelo que demuestre grupos iguales.

_____ grupos de _____ = Total

Haz una matriz que corresponda con el modelo.

_____ hileras de _____ = _____

_____ × _____ = _____

Resuelve usando suma repetida.

Escribe tu respuesta en una oración completa.