Grade Level / Content Area:	*Grade 3-5 / Math - Multiplication*
Standards:	CCSS.MATH.CONTENT.5.NBT.B.6
Concept/Topic to Teach:	Multiplication using Arrays (up to 24)

I. Getting students set to learn Addition

Introduction/Review; Review the work recently done by the class related to multiplication
Anticipatory Set; Explain that we are going to learn how to multiply numbers by using arrays in today's lesson. Demonstrate what an array is.
Objectives;

- The students will be able to multiply numbers (equaling up to 24) using arrays where the number of rows is multiplied by the number of columns.
- Students will demonstrate the commutative property of multiplication where the number of rows times the number of columns is the same as the number of columns multiplied by the number of rows.
- Students will explain to the teacher how multiplication using arrays can be used to multiply even larger numbers and develop their skills with small numbers.

II. Instruction

- **Input and Modeling;** Go through the first two examples from the work sheet together. Remind students of the importance of listening to or reading the question carefully before answering it. Ask the students to complete the remainder of the first worksheet page.

III. Checking for understanding

Checking Understanding; Review the student's completed first worksheet pages and explain any errors.
Guided Practice; Have the students complete the second page of the worksheet.

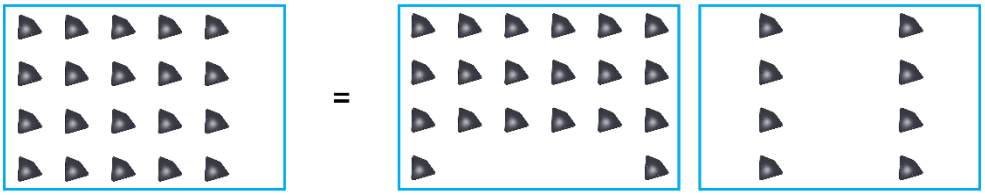
IV. Independent practice – Hands-On Learning

Independent Practice;
Pass out the HyPars Educational kits to the students and indicate these parts will be used to learn more about multiplication (equaling up to 24) using arrays and to demonstrate that the number of rows times the number of columns is the same as the number of columns multiplied by the number of rows.

- From the HyPars Educational Kit, have each student get twenty parts (some HyPars and some Connectors) and make a four row by five column array of parts.
- Ask the students what 4 X 5 equals (have them count the parts they have for the answer if necessary).
- Have the students rotate their array by 90 degrees making a five row by four column array.
- Ask the students what 5 X 4 equals (have them count the parts they have for the answer if nece4ssary) and is it the same answer as 4 X 5?
- Ask the students to assemble (connect) the entire group of parts and them again ask how many parts are in this first assembly.
- Upon confirmation of each student understanding the multiplication of 4 X 5, have the students get twenty-four more parts (including some HyPars and some Connectors) from the HyPars Educational Kits and have them make a three row by eight column array.
- Ask the students what 3 X 8 equals (have them count the parts they have for the answer if necessary)
- Have the students rotate their array by 90 degrees making a eight row by three column array.
- Ask the students if 8 X 3 equals the same answer as 3 X 8.
- Ask the students to assemble (connect) the entire group of parts and then again ask how many parts are in this second assembly.
- Have the students disassemble their assemblies and put the parts away back into their HyPars Educational Kits.

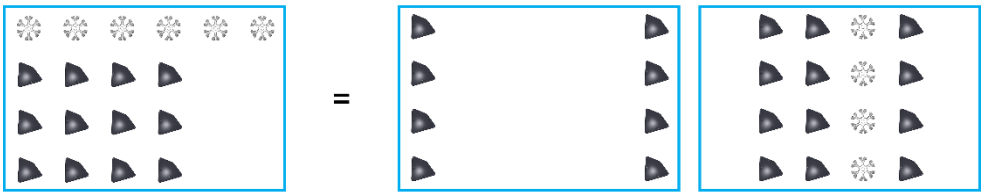
Multiplication using arrays (up to 24) Worksheet

1) Multiply the number of HyPar rows by the number of HyPar columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



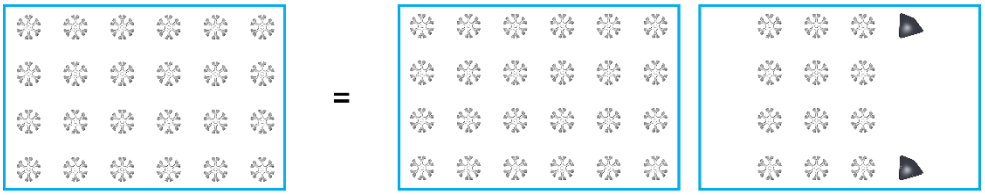
1b)_____ x _____ = _____

2) Multiply the number of HyPar rows by the number of HyPar columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



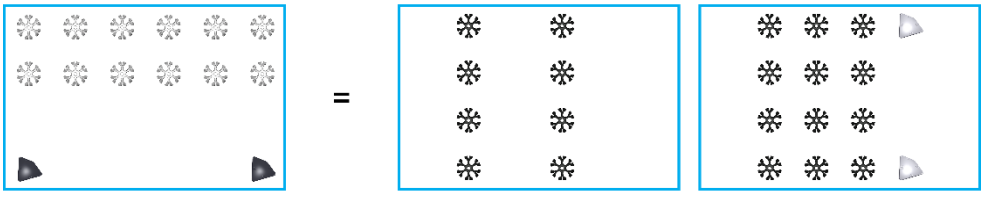
2b) _____ x _____ = _____

3) Multiply the number of Connector rows by the number of Connector columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



3b) _____ x _____ = _____

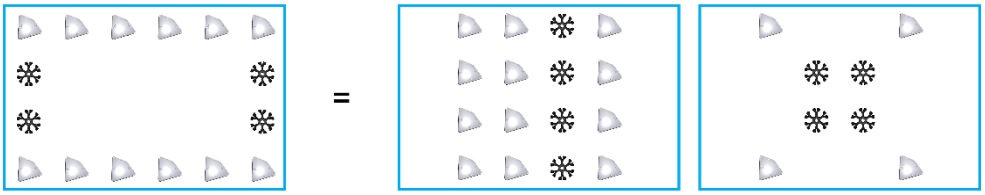
4) Multiply the number of Connector rows by the number of Connector columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



4b)_____ x _____ = _____

Multiplication using arrays (up to 24) Worksheet

5) Multiply the number of HyPar rows by the number of HyPar columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.

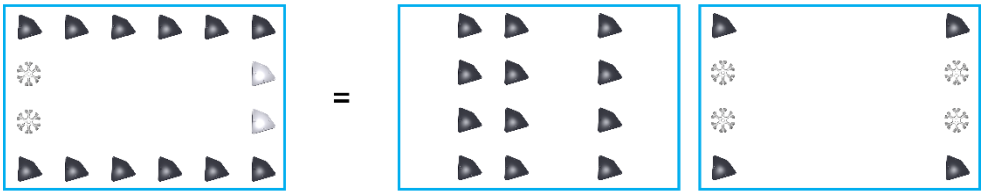


5b)_____ x _____ = _____

6) Multiply the number of Connector rows by the number of Connector columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.

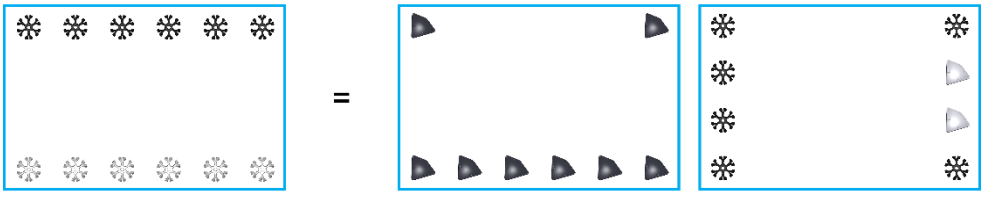
6b)_____ x _____ = _____

7) Multiply the number of black HyPar rows by the number of black HyPar columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



7b)_____ x _____ = _____

8) Multiply the number of black Connector rows by the number of black Connector columns in the first Figure. Circle the second or third Figure that has the correct total. Fill in the equation below the Figures.



8b) _____ x _____ = _____