To Parents and Adults at Home ...

Your child’s class is starting a mathematics unit on multiplication and division. Multiplication and division are basic computational skills that children must eventually master in order to succeed in higher levels of mathematics. The focus of this unit is on developing an understanding of the processes of multiplication and division in order to develop strategies for multiplying and dividing whole numbers up to $5 \times 5$. Children will use counters, number lines, and arrays to develop their understanding.

In this unit, your child will:

- Model multiplication and division up to $5 \times 5$
- Find strategies to multiply and divide up to $5 \times 5$
- Pose and solve story problems involving multiplication and division.

Encourage your child to share different strategies used to multiply and divide.

We use multiplication and division in many day-to-day situations. Here are some suggestions for activities you can do at home:

- Look for things that come in groups of 2, 3, 4, and 5. Create problems. For example: Bikes have 2 tires. How many tires are on 4 bikes?
- Use a deck of playing cards, using only the 1s (Aces) to 5s. Shuffle the cards. Flip the first card. This represents the number of groups. Flip the second card. This represents the number of objects in each group. Have your child draw a picture to match the cards, and write a multiplication and division sentence to match the picture. Continue until all cards are used up.
Lesson 1: Investigating Equal Groups

1. Write a multiplication sentence for each picture.
   a) ★★ ★★
   ★★ ★★
   ★★ ★★
   ★★ ★★
   b) ★★ ★★
   ★★ ★★
   ★★ ★★

2. Kyle bought 3 bags of oranges.
   There were 5 oranges in each bag.
   How many oranges did Kyle buy?
   Draw a picture and write a number sentence to show your solution.

3. Can you use multiplication to find how many in all? Explain.

Lesson 2: Relating Multiplication and Repeated Addition

1. Use this picture.
   
   a) Write a repeated addition sentence.
   b) Write a multiplication sentence.

2. Write as a multiplication sentence.
   a) $2 + 2 + 2$  
   b) $4 + 4$  
   c) $1 + 1 + 1 + 1 + 1$

3. Write as a repeated addition sentence.
   a) $4 \times 3 = 12$
   b) $5 \times 2 = 10$
Lesson 3: Using Arrays to Multiply

1. Write a multiplication sentence for each array.
   a) \[ \begin{array}{c}
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \end{array} \]
   \[2 	imes 3 = 6\]
   b) \[ \begin{array}{c}
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \end{array} \]
   \[2 	imes 3 = 6\]
   c) \[ \begin{array}{c}
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \end{array} \]
   \[3 	imes 3 = 9\]

2. Draw an array for each sentence.
   a) \[4 \times 3 = 12\]
   b) \[2 \times 5 = 10\]
   c) \[3 \times 3 = 9\]

3. There are 3 rows of 5 children in a marching band.
   a) Draw an array to show the band.
   b) Write a multiplication sentence for the array.

Lesson 4: Relating Multiplication Sentences

1. Write 2 multiplication sentences for each array.
   a) \[ \begin{array}{c}
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \end{array} \]
   \[3 	imes 2 = 6\]
   \[2 	imes 3 = 6\]
   b) \[ \begin{array}{c}
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \cdot \\
   \end{array} \]
   \[3 	imes 2 = 6\]
   \[2 	imes 3 = 6\]

2. Arrange 8 stamps into 2 different arrays.
   Write a multiplication sentence for each array.

3. Draw an array to explain why \(3 \times 4\) and \(4 \times 3\) are both equal to 12.
Lesson 5: Division as Grouping

1. Use counters to find the number of groups. Write a division sentence for each problem.
   a) Divide 12 counters into groups of 3.
   b) Divide 8 counters into groups of 2.

2. Students are having an ice cream party. One carton of ice cream makes 5 sundaes. How many cartons of ice cream do they need for 20 sundaes?

3. What do you need to know to divide using grouping? Use words, pictures, or numbers to explain.

Lesson 6: Division as Sharing

1. Use counters to find the number of objects in each group. Write a division sentence to record your work.
   a) 25 oranges are divided into 5 equal groups
   b) 15 balls are divided into 3 equal groups

2. Alice has 16 apple slices. She shares them evenly on 4 plates. How many apple slices are on each plate?

3. Create a division sharing problem for 15 ÷ 3.
Lesson 7: Relating Division and Repeated Subtraction

1. Write a division sentence for each repeated subtraction.
   a) \( 5 - 1 - 1 - 1 - 1 = 0 \)
   b) \( 12 - 3 - 3 - 3 - 3 = 0 \)
   c) \( 6 - 2 - 2 - 2 = 0 \)

2. Write each division sentence as repeated subtraction.
   a) \( 20 ÷ 4 = 5 \)
   b) \( 9 ÷ 3 = 3 \)

3. How is \( 16 - 4 \) different than \( 16 ÷ 4 \)?

Lesson 8: Relating Multiplication and Division Using Arrays

1. Write a multiplication and division sentence for each picture.
   a) \[
   \begin{array}{cccc}
   \cdot & \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot & \cdot \\
   \end{array}
   \]
   b) \[
   \begin{array}{ccc}
   \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot \\
   \cdot & \cdot & \cdot \\
   \end{array}
   \]
   c) \[
   \begin{array}{cc}
   \cdot & \cdot \\
   \cdot & \cdot \\
   \cdot & \cdot \\
   \cdot & \cdot \\
   \end{array}
   \]

2. Use counters to make an array for each number.
   For each array, write 2 multiplication sentences and 2 division sentences.
   a) \( 6 \)
   b) \( 10 \)
   c) \( 15 \)

3. Jeremy is putting his baseball cards into an album.
   Each page can hold 16 cards.
   Each page has 4 rows of pockets.
   How many cards can go in each row?
Lesson 9: Relating Multiplication And Division Using Groups

1. Write a multiplication and division sentence for each picture.
   a) [picture of 3 groups of 2 beads each]
   b) [picture of 2 groups of 3 beads each]

2. Mica has 25 beads to make 5 matching friendship bracelets. How many beads can she put on each bracelet?

3. Explain why $3 \times 2 = 6$ and $6 \div 3 = 2$ are related sentences.
Additional Activity 1: Equal-ominoes

Play with a partner.
You will need a set of 24 equal-omino tiles.

How to play:

- Shuffle the tiles.  
  Place them in a stack.

- Put 1 tile face up on the table.  
  Each player takes 3 tiles.

- Take turns. See if you can match one of your tiles to a tile on the table.

- If you have a match, put down your tile so the matching ends touch.  
  Then take another tile from the stack.

- If you cannot make a match, take another tile from the stack.

- The first player to run out of tiles is the winner.

Take It Further
This time, each player takes 11 tiles.  
Turn the remaining 2 tiles face up.  
Players take turns matching their tiles to a tile on the table.  
The player who uses all 11 tiles first wins.
Equal-omino Tiles

3 × 3 = 9

2 × 4 = 8

4 × 4 = 16

3 × 4 = 12

2 × 5 = 10

1 × 4 = 4

1 × 1 = 1

5 × 3 = 15

1 × 5 = 5

4 × 2 = 8

3 × 1 = 3

5 × 5 = 25
### Equal-omino Tiles, continued

<table>
<thead>
<tr>
<th>Tile Arrangement</th>
<th>Equation</th>
<th>Tile Arrangement</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$2 \times 1 = 2$</td>
<td><img src="image" alt="Tile" /></td>
<td>$4 \times 3 = 12$</td>
</tr>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$5 \times 2 = 10$</td>
<td><img src="image" alt="Tile" /></td>
<td>$4 \times 5 = 20$</td>
</tr>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$3 \times 2 = 6$</td>
<td><img src="image" alt="Tile" /></td>
<td>$2 \times 2 = 4$</td>
</tr>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$1 \times 3 = 3$</td>
<td><img src="image" alt="Tile" /></td>
<td>$3 \times 5 = 15$</td>
</tr>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$4 \times 1 = 4$</td>
<td><img src="image" alt="Tile" /></td>
<td>$1 \times 2 = 2$</td>
</tr>
<tr>
<td><img src="image" alt="Tile" /></td>
<td>$2 \times 3 = 6$</td>
<td><img src="image" alt="Tile" /></td>
<td>$5 \times 1 = 5$</td>
</tr>
</tbody>
</table>
Additional Activity 2: Amazing Arrays

Work with a partner.

You will need 1-cm grid paper and scissors.

How to prepare to play:
- Cut out arrays to represent each product from $1 \times 1$ to $5 \times 5$.
- Use the grid side of each array.
  Write a multiplication expression for the array; for example, $2 \times 3$.
- On the blank side, write the product; for example, 6.

How to play:
- Mix up the arrays and spread them out on a table.
  Some arrays should be grid side up.
  Some arrays should be grid side down.

- Take turns selecting an array.
  If the product is showing, name the multiplication expression.
  If the multiplication expression is showing, name the product.

- If you are correct, keep the array.
  Continue to play until all arrays have been won.
  The player with the most arrays wins.

Take It Further
Cut out the arrays, as above, but leave them blank.
Place all arrays grid side up.
Players select an array.
They give a multiplication sentence for the array.
Additional Activity 3: Division Tag

Play with a partner.

You will need 4 sets of tags numbered 1 to 4. Use each set of tags only once.

How to Play

- Use one set of tags. Write 4 division problems, one on each tag. Exchange tags with your partner.

- Solve your partner’s problems. Check each others’ work.

- Add the answers you got correct. This is your score.

- Play the game 3 more times. Add your score to your previous score each time.

- The player with the highest score wins.

Take It Further

- Each player writes a division problem on 8 of the tags. The tags are shuffled and placed face down.

- Player A turns over 2 tags and writes the answer. Player B checks that the answers are correct. Player A adds the answers to get his score. The tags are not replaced. Player B takes a turn.

- Continue taking turns until the tags are all used. The player with the highest score wins.