Lesson 19

Objective: Multiply by multiples of 10 using the place value chart.

Suggested Lesson Structure

- Fluency Practice (15 minutes)
- Concept Development (20 minutes)
- Application Problem (15 minutes)
- Student Debrief (10 minutes)

Total Time (60 minutes)

NOTES ON TIMING:
The Application Problem comes after the Concept Development in this lesson. The 15 minutes allotted for the Application Problem includes 5 minutes for the Application Problem and 10 minutes for the Problem Set.

Fluency Practice (15 minutes)

- Group Counting 3.OA.1 (4 minutes)
- Multiply with 10 3.NBT.3 (3 minutes)
- Multiply by Different Units 3.NBT.3 (4 minutes)
- Exchange Place Value Disks 3.NBT.3 (4 minutes)

Group Counting (4 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition. These counts review the multiplication taught previously in the module. Direct students to count forward and backward, occasionally changing the direction of the count:

- Sixes to 60
- Sevens to 70
- Eights to 80
- Nines to 90

Multiply with 10 (3 minutes)

Note: This fluency activity prepares students for this lesson.

T: I’ll say a multiplication problem. You say the whole equation. 10 × 1.
S: 10 × 1 = 10.

Continue with the following possible sequence: 10 × 2, 10 × 3, 10 × 8, and 10 × 6.

T: I’ll say a multiple of 10. You say the multiplication fact starting with 10. 20.
S: 10 × 2 = 20.

Continue with the following possible sequence: 30, 40, 90, 70, and 50.
Multiply by Different Units  (4 minutes)

Materials:  (S) Personal white board

Note:  This fluency activity prepares students for this lesson.

T:  (Write 2 × 3 = ____.) Say the multiplication equation in unit form.
S:  2 × 3 ones = 6 ones.
T:  (Write 2 × 3 cats = ____.) On your personal white board, write the multiplication equation.

Continue with the following possible sequence:  3 × 4, 3 × 4 dogs; 4 × 5, 4 × 5 pencils; 5 × 6, 5 × 6 books; 6 × 7, 6 × 7 cars; 7 × 8, 7 × 8 turtles; 8 × 9, 8 × 9 chairs; and 9 × 7, 9 × 7 flowers.

Exchange Place Value Disks  (4 minutes)

Materials:  (S) Place value disks

Note:  This fluency activity prepares students for this lesson.

T:  Make an array showing 3 by 2 ones.  As a multiplication equation, say how many ones you have.
S:  3 × 2 ones = 6 ones.

Continue with the following possible sequence:  3 by 3 ones, 4 by 2 ones, and 5 by 2 ones.

T:  10 ones can be exchanged for 1 of what unit?
S:  1 ten.
T:  Exchange 10 ones for 1 ten.
T:  Make an array showing 4 by 5 ones.
T:  Say how many ones you have as a multiplication equation.
S:  4 × 5 ones = 20 ones.
T:  Say the multiplication equation again; this time, say the answer in units of 10.
S:  4 × 5 ones = 2 tens.
T:  Exchange 20 ones for 2 tens.

Concept Development  (20 minutes)

Materials:  (T/S) Place value disks  (S) Personal white board

Problem 1: Multiply by multiples of 10 using place value disks.

T:  Use your disks to show 2 rows of 3 ones.
S:  (Model 2 × 3 ones array.)
T:  (Write 2 × 3 ones = ______ ones.) Our array shows this equation, true?
S:  True.
Lesson 19: Multiply by multiples of 10 using the place value chart.

T: How many ones do we have in total?
S: 6 ones.

T: Say the multiplication equation in standard form.
S: \(2 \times 3 = 6\).

T: Use your disks to show 2 rows of 3 tens.
S: (Model \(2 \times 3\) tens array.)

T: (Write \(2 \times 3\) tens = _______ tens.) How many tens do we have in total?
S: 6 tens.

T: What is the value of 6 tens?
S: 60.

T: Say the multiplication equation in standard form.
S: \(2 \times 30 = 60\).

Repeat the process with \(3 \times 4\) ones and \(3 \times 4\) tens; \(2 \times 6\) ones and \(2 \times 6\) tens.

**Problem 2: Multiply by multiples of 10 using a place value chart.**

<table>
<thead>
<tr>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

T: (Project or draw the place value chart shown at right.) Use the chart to write an equation in both unit form and standard form.
S: (Write \(2 \times 5\) ones = 10 ones and \(2 \times 5 = 10\).)  

T: How many ones do I have in total?
S: 10 ones.

T: (Project or draw the place value chart shown at bottom right.) Compare the two charts. What do you notice about the number of dots?
S: The number of dots is exactly the same in both charts.  
\(\rightarrow\) The only thing that changes is where they are placed.

T: Because we still have a total of ten dots, what change do you think we will make in our equations?
S: The units will change from ones to tens.

T: Write your equations now.
S: (Write equations.)

T: Say the full equation in standard form.
S: \(2 \times 50 = 100\).

Repeat the process with \(3 \times 6\) ones and \(3 \times 6\) tens.

T: (Write \(80 \times 6 = \_\_\_\_) How would you use this strategy to solve a more complicated problem like the one on the board?
S: We can first think of the problem as \(8\) ones \(\times 6\), which is \(48\). We know that fact since we’ve been practicing our sixes. \(\rightarrow\) Then, all we have to do is move the answer over to the tens place, so it becomes \(48\) tens. \(\rightarrow\) So, the answer is \(480\).

MP.7
Lesson Objective: Multiply by multiples of 10 using the place value chart.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- How do the disks in Problem 1 show the strategy we learned today?
- What is the relationship between the charts in the left column and the charts in the right column in Problem 2? How did the left column help you solve the problems in the right column?
- How does knowing your multiplication facts help you easily multiply by multiples of 10?
Now that we know a strategy for multiplying with multiples of 10, how would we use the same process for multiplying with multiples of 100? What would be the same? (The multiplication facts.) What would change? (The units.)

**Exit Ticket (3 minutes)**

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students’ understanding of the concepts that were presented in today’s lesson and planning more effectively for future lessons. The questions may be read aloud to the students.
Lesson 19 Problem Set

1. Use the disks to fill in the blanks in the equations.
   a. \[4 \times 3 \text{ ones} = \text{ ones}\]
   \[4 \times 3 = \text{ } \]
   b. \[4 \times 3 \text{ tens} = \text{ tens}\]
   \[4 \times 30 = \text{ } \]

2. Use the chart to complete the blanks in the equations.
   \[\begin{array}{c|c}
   \text{tens} & \text{ones} \\
   \hline
   \bullet & \bullet \\
   \bullet & \bullet \\
   \end{array} \]
   a. \[2 \times 4 \text{ ones} = \text{ ones}\]
   \[2 \times 4 = \text{ } \]
   b. \[2 \times 4 \text{ tens} = \text{ tens}\]
   \[2 \times 40 = \text{ } \]
   \[\begin{array}{c|c}
   \text{tens} & \text{ones} \\
   \hline
   \bullet & \bullet \\
   \bullet & \bullet \\
   \end{array} \]
   c. \[3 \times 5 \text{ ones} = \text{ ones}\]
   \[3 \times 5 = \text{ } \]
   d. \[3 \times 5 \text{ tens} = \text{ tens}\]
   \[3 \times 50 = \text{ } \]
Lesson 19: Multiply by multiples of 10 using the place value chart.

3. Fill in the blank to make the equation true.

<table>
<thead>
<tr>
<th>a. ________ = 7 \times 2</th>
<th>b. ________ tens = 7 tens \times 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. ________ = 8 \times 3</td>
<td>d. ________ tens = 8 tens \times 3</td>
</tr>
<tr>
<td>e. ________ = 60 \times 5</td>
<td>f. ________ = 4 \times 80</td>
</tr>
<tr>
<td>g. 7 \times 40 = ________</td>
<td>h. 50 \times 8 = ________</td>
</tr>
</tbody>
</table>

Name ________________________________ Date ____________________

1. Use the chart to complete the blanks in the equations.

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6 \times 5 \text{ ones} = \underline{\text{_____}} \text{ ones} \\
6 \times 5 = \underline{\text{____}} \\

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6 \times 5 \text{ tens} = \underline{\text{_____}} \text{ tens} \\
6 \times 50 = \underline{\text{____}}

2. A small plane has 20 rows of seats. Each row has 4 seats.
   
a. Find the total number of seats on the plane.

b. How many seats are on 3 small planes?
Lesson 19 Homework

Name ___________________________ Date ________________

1. Use the disks to complete the blanks in the equations.

   a. \[2 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}\]
      \[3 \times 3 = \underline{\hspace{1cm}}\]

   b. \[2 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}\]
      \[30 \times 3 = \underline{\hspace{1cm}}\]

2. Use the chart to complete the blanks in the equations.

   a. \[2 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}\]
      \[2 \times 5 = \underline{\hspace{1cm}}\]

   b. \[2 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}\]
      \[2 \times 50 = \underline{\hspace{1cm}}\]

   c. \[5 \times 5 \text{ ones} = \underline{\hspace{1cm}} \text{ ones}\]
      \[5 \times 5 = \underline{\hspace{1cm}}\]

   d. \[5 \times 5 \text{ tens} = \underline{\hspace{1cm}} \text{ tens}\]
      \[5 \times 50 = \underline{\hspace{1cm}}\]
3. Match.

- $6 \times 2$ matches $120$
- $6 \text{ tens} \times 2$ matches $21$
- $7 \times 3$ matches $12$
- $7 \text{ tens} \times 3$ matches $270$
- $70 \times 5$ matches $210$
- $3 \times 90$ matches $350$

4. Each classroom has 30 desks. What is the total number of desks in 8 classrooms? Model with a tape diagram.