

## Grade 4 – 5: Mathematics

# Two-Digit Multiplication: Area Model

This resource can be used to plan an individual mathematics lesson or a unit of study. The suggested activities can be used in the order presented here, or they can be adapted for your lesson plan and classroom.

# CURRICULUM OBJECTIVES

## VIDEO OUTCOMES

### **Mathematics / Number and Operations in Base Ten**

Multiply two two-digit numbers, using strategies based on place value and the properties of operations.

Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

## TEACHER PACK OUTCOMES

### **Mathematics / Number and Operations in Base Ten**

Multiply two two-digit numbers, using strategies based on place value and the properties of operations.

Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

## Activity

## Resources

## Outcome

### Activity 1: Introducing the Area Model

**Timeframe:** 25 minutes

**Lesson overview:** Students will be introduced to multiplication using the area model method by watching the Miniclip video, discussing the method, and practicing it as a class.

As a class, discuss the concept of multiplication and the various methods that can be used to solve multiplication problems.

Introduce the area model as one of these multiplication methods. Then as a class, watch the ClickView Miniclip *Two-Digit Multiplication: Area Model*.

After watching the video, discuss the new method presented in the video.

- Why do you think it is called the area model?
- How does it use expanded form?
- How does it help simplify the multiplication process?

Ask students to suggest some two-digit by two-digit multiplication problems to use for a demonstration. Select one of these suggestions and write it on the board. Then draw up the area model box underneath with two rows and two columns. **For example:  $24 \times 38$**

	30	8
20		
4		

Take students through the process step-by-step, including how to write each number of the multiplication problem in its expanded form and the correct way to write it around the box. Invite students to solve the expanded form multiplication problem for each box, with another student adding up all the values to find the final answer.

Once you have the final answer, check that the answer is the same as the multiplication problem by asking a student to check on their calculator or use another multiplication method they are familiar with.

Discuss how the multiplication answers for each box correspond with the concept of area.

- Which values represent the perimeters?
- How does the visual layout of area change the way you see multiplication?
- Can you see any patterns or trends in the area model method?
- Do you like this multiplication method or is there another that you prefer?

Continue demonstrating examples for as long as desired using students' suggestions.

ClickView Miniclip *Two-Digit Multiplication: Area Model*

Smartboard / Digital display

Students will:

- Multiply two two-digit numbers, using strategies based on place value and the properties of operations.
- Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Activity	Resources	Outcome
<p><b><u>Activity 2: Area Model Mania!</u></b>  <b>Timeframe:</b> 20 minutes  <b>Lesson overview:</b> Students will complete the worksheet to practice multiplication using the area model.</p> <hr/> <p>Distribute a copy of the <i>Area Model Mania!</i> worksheet to each student.</p> <p>They are to complete it at their own pace. The last section requires them to create their own area model multiplication problems. They can swap this section with a partner and solve each other's multiplication problems.</p> <p>Encourage students to practice their understanding in whatever method works best for them, such as using chalk and tape on the classroom carpet or outside, or in the playground.</p> <p><b>Answers:</b>  <b>A)</b> <math>17 \times 31 = 527</math>  <b>B)</b> <math>29 \times 64 = 1856</math>  <b>C)</b> <math>44 \times 12 = 528</math>  <b>D)</b> <math>58 \times 99 = 5742</math>  <b>E)</b> <math>79 \times 67 = 5293</math>  <b>F)</b> <math>85 \times 47 = 3995</math>  <b>G)</b> <math>62 \times 28 = 1736</math>  <b>H)</b> <math>54 \times 67 = 3618</math>  <b>I) J) K)</b> Students' answers will vary.</p>	<p><i>Area Model Mania!</i> worksheet</p> <p>Notebooks</p> <p><u>Optional:</u> Tape</p> <p>Chalk</p> <p>Classroom carpet or outside ground</p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Multiply two two-digit numbers, using strategies based on place value and the properties of operations.</li> <li>• Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> </ul>

Activity	Resources	Outcome
<p><b><u>Activity 3: Introducing Alternative Multiplication</u></b>  <b>Timeframe:</b> Variable duration  <b>Lesson overview:</b> Students will be introduced to other methods of solving multiplication problems such as the lattice method, expanded form, and extended form.</p> <hr/> <p>Once students have become familiar with the area model multiplication method, you can introduce other methods supported by Miniclips.</p> <p>These include:</p> <ul style="list-style-type: none"> <li>• <a href="https://online.clickview.us/videos/38945710">Multiplication Using the Lattice Method</a> https://online.clickview.us/videos/38945710</li> <li>• <a href="https://online.clickview.us/videos/38945654">Multiplication Using the Expanded Form</a> https://online.clickview.us/videos/38945654</li> <li>• <a href="https://online.clickview.us/videos/39414479">Two-Digit Multiplication: Standard Algorithm</a> https://online.clickview.us/videos/39414479</li> </ul> <p>Once you have watched the Miniclips, you can use their complementary Teacher Packs, printable worksheets, and interactive videos to extend students' understanding of each method.</p>	<p>Smartboard / Digital display</p> <p>ClickView Miniclip – <a href="#">Multiplication Using the Lattice Method</a></p> <p>ClickView Miniclip – <a href="#">Multiplication Using the Expanded Form</a></p> <p>ClickView Miniclip – <a href="#">Two-Digit Multiplication: Standard Algorithm</a></p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• Multiply two two-digit numbers, using strategies based on place value and the properties of operations.</li> <li>• Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</li> </ul>

## Activity

## Resources

## Outcome

### **Activity 4: Multiplication Methods**

**Timeframe:** 20 minutes

**Lesson overview:** Students will review the variety of multiplication methods that can be used to solve equations.

Discuss the various methods of multiplication that students have used or are aware of (e.g. area model, lattice method, expanded form, extended form). Brainstorm these methods and review how each is done.

Distribute a copy of the *Multiplication Methods* worksheet to each student.

Students will create a number sentence and solve it by using each of the four methods shown on the worksheet.


Once students have finished one number sentence, they can repeat the activity with a new number sentence in their notebooks.

Afterwards, discuss as a class which method students' prefer and why.

*Multiplication Methods*  
worksheet

Students will:

- Multiply two two-digit numbers, using strategies based on place value and the properties of operations.
- Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Activity	Resources	Outcome
<p><b><u>Activity 5: Interactive Video</u></b>  <b>Timeframe:</b> 15 minutes  <b>Lesson overview:</b> Students will watch the ClickView Miniclip and answer the interactive questions to show their understanding of multiplication using the area method.</p> <hr/> <p>ClickView has created an interactive video lesson to accompany the ClickView Miniclip <i>Two-Digit Multiplication: Area Model</i>. It includes a range of question types such as multiple choice, missing words, and short answer response.</p> <p>You can assign the interactive video to your students to do at any suitable point in your unit. Alternatively, you can edit the premade questions to suit your students or create your own interactive video.</p> <p>To share the interactive video with your students, follow these steps:</p> <ol style="list-style-type: none"> <li>1. Search for the Miniclip <i>Two-Digit Multiplication: Area Model</i> that has the  logo</li> <li>2. Click to view the video</li> <li>3. Click on the "Interactive videos" tab beneath the video</li> <li>4. Click the "Save to Workspace" button on the interactive video</li> <li>5. From here you can either click "Share with your students" or access it via your Workspace <ul style="list-style-type: none"> <li>• If you choose "Share with your students", copy the link and send it to your students</li> <li>• Otherwise go to your Workspace, select the "Interactive videos" folder, and click "Share" to access the link and send to students</li> </ul> </li> </ol> <p>Students can watch and answer the interactive questions either in class or at home. Their results will be collated for you to view from your Workspace.</p> <p>The following guides are available if you require assistance:</p> <p><a href="https://www.clickviewsupport.com/hc/en-us/articles/115005656528-PB202">Creating an interactive video</a>  <a href="https://www.clickviewsupport.com/hc/en-us/articles/115005496667-PB208">How do I share an interactive video?</a>  <a href="https://www.clickviewsupport.com/hc/en-us/articles/115005494867-PB206">How do I make my interactive video private/public?</a></p>	<p>Interactive video for the ClickView Miniclip <i>Two-Digit Multiplication: Area Model</i></p> <p>1:1 devices with Internet connection</p>	<p>Assessment</p>