3 Math Unit 06: Connect Area and Multiplication

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 2**
Length: **11 Days**
Status: **Published**

Unit Overview

Developing the Concept of Area

Students begin to explore different ways to use their multiplication skills. In this unit, students discover strategies for finding the area of rectangles and composite rectilinear figures. They are introduced to the concept of finding area of 2-dimensional figures by covering it with unit squares without gapes of overlaps and counting the number of unit squares, a process known as *tiling*.

Students find the area of a figure by identifying the number of rows and columns of unit squares it takes to tile it completely,. They then represent the situation with a multiplication equation. This process leads students to make explicit connections between counting units of area with arrays and multiplication. Rather than counting individual square units or skip counting by rows or columns, students discover that they can multiply the number of columns by the number of rows to find the area of a rectangle.

Finding Area by Decomposing Figures

Students then apply the Distributive Property as they discover that they can decompose a larger rectangle into two smaller rectangles, and that the area of the larger rectangle is the sum of the areas of the smaller rectangles. This understanding is extended to the area of composite figures, where students decompose a rectilinear figure into rectangles, find the area of each of the rectangles, and then add them to find the total area of the composite figure. Finally, students apply their understanding of area to find the area of figures in real-world situations.

What Students Are Learning

- Students explore the concept of area and how to use tiling and other strategies to find it.
- Students learn to multiply the length and width of a rectangle to find its area.
- Students decompose rectilinear figures to find the total area.

Number Routines

- About How Much?
- Decompose It
- Where Does It Go?
- Would You Rather?
- Which Doesn't Belong?
- Notice & Wonder
- Is It Always True?

Standards

3.M.B.3	Recognize area as an attribute of plane figures and understand concepts of area

	measurement.
3.M.B.3.a	A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
3.M.B.3.b	A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
3.M.B.4	Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard units).
3.M.B.5.a	Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths.
3.M.B.5.b	Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
3.M.B.5.c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
3.M.B.5.d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Materials

Core Materials:

Reveal Math

6.1 Understand Area

6.2 Count Unit Squares to Determine Area

6.3 Use Multiplication to Determine Area

6.4 Determine the Area of a Composite Figure

6.5 Use the Distributive Property to Determine Area

6.6 Solve Area Problems

Supplemental Materials:

- ST Math
- Happy Numbers
- 3 Act Lessons
- Building Fact Fluency Kit
- Brainingcamp Manipulatives
- Nearpod Lessons
- Brainpop Resources
- Online Resources

Technology

DA	Data & Analysis
	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Assessment

Formative Assessment

- Unit Readiness Diagnostics
- Lesson Checks
- Exit Tickets
- Teacher Observation

Summative Assessment

- Unit Assessment Performance Task
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Differentiated Instruction			
Accommodate Based on Students Individual Needs: Strategies			
Time/General	**Processing**	**Comprehension**	**Recall**

• Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/outline	• Extra response time • Have students verbalize steps • Repeat, clarify, or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Reading partners	• Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning	• Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers
Assistive Technology • Computer/whiteboard • Tape recorder • Spell-checker • Audio-taped books	**Tests/Quizzes/Grading** • Extended time • Study guides • Focused/chunked tests • Read directions aloud	**Behavior/Attention** • Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	**Organization** • Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices
- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary

- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework
- Extension Activities
- Today's Challenge

Interdisciplinary Connections

3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
RL.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of a literary text, referring explicitly to textual evidence as the basis for the answers.
RL.TS.3.4	Utilize and reference features of a text when writing or speaking about a text, referring to parts of stories, dramas, and poems, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.
W.IW.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information

	clearly.
3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Career Readiness, Life Literacies & Key Skills

9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
9.4.5.CT	Critical Thinking and Problem-solving
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
9.1.5.FI	Financial Institutions
	People can choose to save money in many places such as home in a piggy bank, bank, or credit union.
9.1.5.FI.1	Identify various types of financial institutions and the services they offer including banks, credit unions, and credit card companies.
	There are specific steps associated with creating a budget.
9.1.5.PB.1	Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

Career Ready Practices

STEM in Action

STEM Career: Architectural Drafter: Sam talks about his aspirations to be an architectural drafter.

Sam Finds the Number of Tiles: Sam talks about the number of tiles needed to cover the kitchen floor.

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.