07. Geometry, Investigating Equal Shares & Whole Number Operations

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **4 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will focus on the following skills and concepts:

- 2- and 3-Dimensional Shapes
- Partitioning Rectangles
- Equal Groups and Arrays
- Equal Shares

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Enduring Understandings:

- Visualization, spatial reasoning, and geometric modeling are strategies to enhance problem solving.
- Two and three dimensional shapes have properties and relationships similar to each other.
- Three-dimensional or solid figures have length, width, and height.
- Many can be described, classified, and analyzed by their faces or flat surfaces, edges, and vertices.
- Many everyday objects closely approximate standard geometric solids.
- A shape can be identified by the number of its sides, vertices, angles.
- Some shapes can be combined to make new shapes.
- Some shapes can be decomposed into other shapes.
- Rectangles can be partitioned into equal squares. A region can be divided into equal-sized parts in different ways.
- Equal-sized parts of a region have the same area but not necessarily the same shape.
- Repeated addition involves joining equal groups.
- An array involves joining equal groups and is one way to think about repeated addition.

Essential Questions:

- How can shapes and solids be described, and compared, and used to make other shapes?
- How can I identify and describe solid figures by describing the faces, edges, and sides?
- In what ways can I match solid geometric figures to real-life objects?
- How can you tell how many parts are in a whole?
- How do you know how many equal parts it takes to make a whole?
- What are halves, thirds, and fourths of a whole?
- How can I use the array model to explain multiplication?

- How are repeated addition and multiplication related?

CONTENT AREA STANDARDS

2.M

A. Measure and estimate lengths in standard units

B. Relate addition and subtraction to length

C. Work with time and money

2.DL

A. Understand concepts of data

B. Represent and interpret data

2.G

A. Reason with shapes and their attributes

MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.2.OA.C.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.2.G.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
MA.2.G.A.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
MA.2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

LA.RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.

LA.W.2.5	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed through self-reflection, revising and editing.
LA.SL.2.1	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

STUDENT LEARNING TARGETS

- I can name shapes given a set of attributes (e.g., name a closed shape that has 6 sides)
- I can draw shapes given a set of attributes (e.g., draw a closed shape that has 6 sides)
- I can describe the attributes (e.g., sides, angles, faces, vertices, etc.) of:
    - Triangles
    - Quadrilaterals
    - Pentagons
    - Hexagons
    - Cubes

- I can examine visual attributes to determine whether a shape is a triangle, quadrilateral, pentagon, hexagon, or cube
- I can draw lines in a rectangle to divide it into rows and columns of same-size squares
- I can count to find the total number of same-size squares in partitioned rectangles
- I can explain what happens to the size of the shares when identical wholes are partitioned into more pieces
- I can identify examples and non-examples of circles and rectangles with two, three, or four equal shares of a whole
- I can describe equal shares using the following terminology:
    - Halves, thirds, fourths, and quarters
    - Half of, third of, fourth of, and quarter of

- I can describe the whole as two halves, three thirds, or four fourths
- I can draw lines to equally divide circles and rectangles into two, three, or four equal shares
- I can partition a circle or rectangle into the same number of shares in multiple ways (e.g., use different shapes within the same whole)
- I can explain why equal shares of identical wholes do not need to have the same shape
- I can describe how to find the total number of objects in a rectangular array
- I can solve repeated addition problems to find the number of objects in rectangular arrays
- I can represent an array of objects using numbers and symbols in an equation

Declarative Knowledge

Students will understand that:

- specified attributes are used to name and draw shapes.
- rectangles can be partitioned into rows and columns of same-size squares.

- whole and shares of partitioned circles and rectangles can be described and named.
- circles and rectangles can be partitioned into two, three or four equal shares.
- addition can be used to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns.
- equations can be written to express the total number of objects in a rectangular array as a sum of equal addends.

Procedural Knowledge

Students will be able to:

- Draw shapes having specified attributes.
- Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- Describe the whole and shares of partitioned circles and rectangles.
- Partition circles and rectangles into two, three or four equal shares.
- Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns.
- Write an equation to express the total number of objects in a rectangular array as a sum of equal addends.

EVIDENCE OF LEARNING

Refer to the 'Formative, Summative, and Benchmark Assessments' sections.

Alternate Assessments

- Portfolios
- Verbal Assessment (instead of written)
- Multiple choice
- Modified Rubrics
- Performance Based Assessments

Formative Assessments

- Journal Pages
- Self-Assessments/Student Friendly Scales
- White board responses
- Exit/Entrance Tickets
- Math Talks
- Open Response

Summative Assessments

- End of Unit Assessment
- Fact Fluency Assessments
- End of Unit Self Assessment

Benchmark Assessments

- EDM BOY Assessment
- IXL Screener / Diagnostic Snapshot BOY
- IXL Diagnostic Snapshot MOY
- IXL Diagnostic Snapshot EOY

RESOURCES (Instructional, Supplemental, Intervention Materials)

Core Instructional Materials:

- Everyday Math Grade 2 Unit 8Resources
  - Math Masters
  - Student Journal Volume 1
  - ConnectED

Lessons:

- 8-1
- 8-2
- 8-3
- 8-4
- (Independent) Problem Solving 8a
- 8-5
- 8-6
- 8-7
- (Independent) Problem Solving 8b

- 8-8
- 8-9
- 8-10
- 8-11
- 9-1
- 9-3
- (Independent) Problem Solving 9a
- (Independent) Problem Solving 9b

Books:

- *The Greedy Triangle* by Marilyn Burns

Supplemental Resources:

- IXL
- Graham Fletcher 3 Act Task- Cover the Floor https://gfletchy.com/cover-the-floor/
- Illustrative Math- Delayed Gratification https://tasks.illustrativemathematics.org/content-standards/2/MD/C/tasks/1304
- Illustrative Math- Counting Dots in Arrays: http://tasks.illustrativemathematics.org/content-standards/2/OA/C/4/tasks/3
- Illustrative Math- Partitioning a Rectangle into Unit Squares: http://tasks.illustrativemathematics.org/content-standards/2/OA/C/4/tasks/2063

INTERDISCIPLINARY CONNECTIONS

ELA:

Writing- Lesson 8-4

Reading- *The Greedy Triangle* by Marilyn Burns (Lesson 8-2)

- Career Readiness: Utilize Critical Thinking to Make Sense of Problems and Persevere in Solving Them
- Technology/Multimedia: Educational Tech Application
- Social Studies: Current Events
- Science & Health: Engineering

LA.RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
LA.W.2.5	With guidance and support from adults and peers, focus on a topic and strengthen writing as needed through self-reflection, revising and editing.

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

- simplify written directions
- visuals
- manipulatives
- graphic organizers
- sentence starters
- wait time
- additional time for tasks
- verbal responses
- illustrations
- graph paper

See link to Accommodations & Modifications document in course folder.