

## GRADE 3 UNIT 5 – GEOMETRY & MEASUREMENT

<p><b>Established Goals:</b> Standards</p> <p><b><u>Operations and Algebraic Thinking</u></b></p> <p><b>3.3.OA.7:</b>Fluently multiply and divide within 100, using the relationship between multiplication and division</p> <p><b><u>Number and Base Ten</u></b></p> <p><b>3.3.NBT.2:</b> Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p><b><u>Measurement and Data</u></b></p> <p><b>3.3.MD.6, MD7a:</b> Find the area of a rectangular array by counting the number of square units and compare that number with the product of the (whole number) side lengths.</p> <p><b>3.3.MD.8:</b> Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.</p> <p><b><u>Geometry</u></b></p> <p><b>3.3.G.1:</b> Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</p>	<b>Transfer</b>	
	<p><i>Students will be able to:</i></p> <p>Use a several strategies to calculate perimeter and area of figures and apply these problem solving strategies in real world situations.</p> <p>Fluently add/subtract/multiply and divide numbers with accuracy and efficiency.</p> <p>Students will recognize that shapes in different categories may share similar attributes.</p>	
	<b>Meaning</b>	
	<b>ENDURING UNDERSTANDING</b>	<b>ESSENTIAL QUESTIONS</b>
	<ul style="list-style-type: none"> <li>Knowing the Perimeter Formulas and strategies will solve problems involving Perimeter</li> <li>Knowing Area Formulas (L X W) or Counting Square Units will solve problems involving Area</li> <li>Breaking Apart Irregular Figures to solve for Area and Perimeter is a strategy to solve more complex problems involving Perimeter and Area</li> <li>Mathematical Processes and Formulas are strategies to calculate Perimeter and Area</li> </ul>	<ul style="list-style-type: none"> <li>How can I use tools and formulas to solve real world problems involving area and perimeter?</li> <li>Which strategy will I use to calculate perimeter and area of regular and irregular figures?</li> <li>Can understanding mathematical processes help me solve real world problems involving perimeter and area?</li> <li>Can figures have the same area and have different perimeters?</li> </ul>
	<b>Acquisition</b>	
<b>KNOWLEDGE</b>	<b>SKILLS</b>	
<p><i>Students will know how to...</i></p> <ul style="list-style-type: none"> <li>Fluently multiply and divide within 100</li> <li>Fluently add and subtract within 1000</li> <li>Know Area and Perimeter Formulas</li> <li>Measure and calculate area by counting unit squares or multiplying L X W</li> <li>Measure and calculate perimeter of polygons</li> <li>Relate area to the operations of multiplication and addition</li> </ul>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>Use tools and formulas to solve real world and mathematical problems involving perimeter of polygons</li> <li>Use tools and formulas to solve real world problems involving area of figures</li> <li>Explain how students found perimeter and area of given real world problems</li> <li>Construct argument or proof of how</li> </ul>	

## Grade 3 Math Unit

	<ul style="list-style-type: none"> <li>Find the area of polygons with whole-number side lengths</li> <li>Find perimeter of a polygons</li> <li>Multiply side lengths to find areas of rectangles</li> <li>Use tiling to show in a concrete case that the area of a rectangle</li> <li>Recognize area as additive</li> <li>Recognize rhombuses, rectangles, and squares as examples of quadrilaterals</li> <li>Breaking Apart Irregular Figures is a strategy to find Area &amp; Perimeter</li> <li>A= Area</li> <li>P= Perimeter</li> <li>Area Formulas (L X W) or Counting Square Units</li> <li>Perimeter Formulas (S+S+S+S) or Counting Units</li> </ul>	<p>students found perimeter and area.</p> <ul style="list-style-type: none"> <li>Show that the area is the same as would be found by multiplying the side lengths</li> <li>Represent whole-number products as rectangular areas in mathematical reasoning.</li> <li>Use area models to represent the distributive property in mathematical reasoning.</li> <li>Find an unknown side length of a polygon</li> <li>Draw examples of quadrilaterals</li> <li>Explain strategies for finding area and perimeter if polygons</li> <li>Determine Perimeter and Area of Irregular Figures</li> <li>Compare Perimeters of 2 or more Figures</li> <li>Compare Area of 2 or more Figures</li> </ul>
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Vocabulary			Instruction and Pacing (suggested order to teach)	
Equilateral	Square Units	Centimeter	<b>Geometry – Geometry Basics Shapes 3D Shapes &amp; Their Attributes</b>	<b>2 Weeks</b>
Pentagon	Length	Kilometer	<b>Measurement – Perimeters of Regular and Irregular Polygons</b>	<b>1 ½ Week</b>
Quadrilateral	Width	Mile	<b>Measurement – Area of Rectangular Arrays and Polygons</b>	<b>1 ½ Week</b>
Trapezoid	Height	Polygon	<b>Geometry &amp; Meas. – Solving Real World Problems solving for Area and Perimeter</b>	<b>1 Week</b>
Distributive Property	Perimeter	Irregular	<b>Fluency Review – Add/Sub within 1000 &amp; Problem Solving (Standard Algorithm)</b>	<b>1 Week</b>
Figure	Area	Yards	<b>Fluency (Multiplying/Divide within 100)</b>	<b>Entire Unit</b>
Rectangle	Feet	Square	<b>Review and Benchmark Testing</b>	<b>1 week</b>
Inches	Equilateral	Triangle		
Meter	Overlapping	non-overlapping		
Rectilinear figure	algorithm			
<b>Resources</b>				

## Grade 3 Math Unit

Common Core Standards, New Jersey Model Curriculum

Envisions Math Program Suggested Topics

Topic 11 Two Dimensional Shapes & Attributes

Topic 13 Perimeter

Topic 16 Data

MANIPULATIVES & GRAPHIC ORGANIZERS – Pattern Blocks, Flat Shapes, Geometric Solids/ 3D Shapes, Rulers, Unit Cubes, Graph Paper (Area and Creating Graphs), Templates for Communicators/Smart Pal Sleeves

NCTM Illuminations <http://illuminations.nctm.org>

Illustrative Math <https://www.illustrativemathematics.org/>

<https://grade3commoncoremath.wikispaces.hcps.org>

<http://illuminations.nctm.org>, <https://www.illustrativemathematics.org>

<http://pearsonrealize.com> <http://prodigygame.com>

### **Additional Resources for ELL Learners**

**Spanish Envisions Digital Path & Printable Worksheets**

**Problem solving worksheet**

[http://media.pearsoncmg.com/curriculum/math/envision2012/pdf/cc4\\_tt\\_1.pdf](http://media.pearsoncmg.com/curriculum/math/envision2012/pdf/cc4_tt_1.pdf)

<http://www.franklinboe.org/cms/lib/NJ01000817/Centricity/Domain/2056/Katie%20Bookshelf%20Word%20Problem%20Kids.pdf>

<http://thesingaporemaths.com/>

**Number sense and Place Value Unit** <http://www.njctl.org/courses/math/3rd-grade-math/place-value/>

[https://www.georgiastandards.org/Georgia-Standards/Frameworks/CCGPS\\_Math\\_3\\_Unit1Framework.pdf](https://www.georgiastandards.org/Georgia-Standards/Frameworks/CCGPS_Math_3_Unit1Framework.pdf)

**Addition and Subtraction Fluency** <http://www.njctl.org/courses/math/2nd-grade/three-digit-addition-subtraction/>

**Multiplication and Division Fluency** <http://www.njctl.org/courses/math/3rd-grade-math/multiplication/>

<http://www.njctl.org/courses/math/3rd-grade-math/division/>

**Classifying & sorting Polygons** <http://www.pbslearningmedia.org/resource/mgbh.math.g.classpoly/classifying-polygons/>

**Geometry** <http://www.njctl.org/courses/math/3rd-grade-math/shapes-and-perimeter/>

**Measurement** <http://content.njctl.org/courses/math/3rd-grade-math/graphs/graphs-2/graphs-2-2015-03-23-1-slide-per-page.pdf>

**Measurement Interactive** <http://interactivesites.weebly.com/measurement.html>

**Perimeter and Area interactives** <http://interactivesites.weebly.com/areaperimeter.html>

**Area and Perimeter Teaching Strategies** <http://www.scholastic.com/teachers/top-teaching/2012/12/10-hands-strategies-teaching-area-and-perimeter>

## Grade 3 Math Unit

### Differentiation and Accommodations

(options)  
 Provide graphic organizers  
 Provide additional examples and opportunities for additional problems for repetition  
 Provide tutoring opportunities  
 Provide retesting opportunities after remediation (up to teacher and district discretion)  
 Teach for mastery not test  
 Teaching concepts in different modalities  
 Adjust pace and homework assignments

#### **ELL Modifications**

- Write about how to solve real-world mathematical problems on how to find the perimeter and area of polygons with known or unknown side lengths.
- Explain why rectangles may have the same area but different perimeters or same perimeters using L1 and/or gestures, examples and selected technical words
- Use a number word chart in English and Spanish
- Illustrated word wall especially geometry terms
- Use sentence frames with problem solving and math explanations
- Use manipulatives- place value blocks, rulers, shapes, unifix cubes
- Use variety of strategies to solve word problems- act out word problems, draw pictures, model
- Total physical response- students physically show how to solve perimeter and area, represent polygons using yarn

ELL scaffolding for Unit 5 3<sup>rd</sup> grade

<http://www.state.nj.us/education/modelcurriculum/math/ellscaffolding/revise/3u5.pdf>

#### **21<sup>st</sup> Century Skills**

Critical Thinking, Creative Thinking, Collaborating, Communicating, and Technology Literacy

#### **Instructional Strategies**

Fairfield Township School recognizes the importance of the varying methodologies that may be successfully employed by teachers within the classroom and, as a result, identifies a wide variety of possible instructional strategies that may be used effectively to support student achievement. These may include, but not be limited to, strategies that fall into categories identified by the Framework for Teaching by Charlotte Danielson:

- Communicating with students
- Using questioning and discussion techniques
- Engaging students in learning
- Using assessment in instruction
- Demonstrating Flexibility and Responsiveness

#### **Interdisciplinary Connections**

ELA, Science, and Technology

#### **Common Misconceptions**

Difficulty with remembering the geometry vocabulary  
 Students have difficulty seeing differences in certain solid or plane shapes  
 Seeing and describing shapes abstractly or sides that cannot be seen  
 Students have difficulty distinguishing between face, edge and corner  
 Students have difficulty finding measurements to unknown sides

#### **Proper Conceptions**

Solid and Plane shapes have mathematical names  
 Describing an object by touching it can help see the differences  
 Visualizing objects and then drawing the object can help you describe the object  
 Using a box or a desk in the room can help to see faces, edges and corners  
 Use measurements of opposite sides to help determine unknown sides

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# ASSESSMENTS

**Suggested Formative Assessment (options)**  
Problem of the Day  
Lesson Quizzes  
Exit Ticket  
Anecdotal Records (Topic Observation Checklist)

**Suggested Summative Assessment** - Grade Level developed Unit/Envisions Topic Tests/ Ed Connect Tests/ State Unit Benchmark/Performance Task