Unit Title: Measurement and Geometry

Subject: Mathematics **Grade Level: 8th** **Unit Title: Measurement and Geometry**	**Timeframe Needed for Completion:** 6 weeks **Grading Period: 1st 9-weeks**

Big Idea/Theme: Shape it up!
Understandings:

- **Effects on perimeter, area and volume with change(s) in dimensions**
- **Measure indirectly**
- **Proportionality**
- **Geometric modeling/Geometric Probability**
- **Dilations**
- **Ratio, Proportion and percent(Maintenance Skills)**
- **Volume and Surface Area (Maintenance Skills)**

Essential Questions:
How could you determine how tall a person is from a picture without a measuring device?
What is important about knowing objects are similar?
What kind of problems can be solved with geometry?
What makes things change?
How would the world be different if it was two dimensional?
How would your life be different if there were no pictures?
How would sports be different if there were no ratios, proportions and percents?
Which do you use most often surface area or volume? Why?

Guiding Questions:
Explain the effects on the perimeter when the length, width or both are changed?
Explain the effects on the area and volume when the length, width, height or all three have changed?
What determines if a dilation results in an enlargement?
What determines if a dilation results in a reduction?
What determines if a dilation results in a congruent figure?
What effect does having a negative scale factor have on a figure?
If a figure is dilated by a particular scale factor how is the perimeter and/or area affected?
What is the relationship between ratio, proportion and percents?
How is percent of change related to dilations?
How can you use geometric models to determine your chances of

Curriculum Goals/Objectives (to be assessed at the end of the unit/quarter)

COMPETENCY GOAL 2:	**The learner will understand and use measurement concepts.**
	Objectives **2.01** Determine the effect on perimeter, area or volume when one or more dimensions of two- and three-dimensional figures are changed. **2.02** Apply and use concepts of indirect measurement.
COMPETENCY GOAL 3:	**The learner will understand and use properties and relationships in geometry.**
	Objectives **3.01** Represent problem situations with geometric models. **3.03** Identify, predict, and describe dilations in the coordinate plane.

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winning a prize throwing darts at the county fair?
How can you determine the area of a shaded region?

Essential Skills/Vocabulary:

Vocabulary:

geometric probability
area
volume
cylinder
cube
similar figures
scale drawings
transformation
enlargement
reduction
shrink
stretch
scaling
scale factor
image
pre-image
Sample notation:
$\nabla ABC \rightarrow \nabla DEF$
$\nabla ABC \rightarrow \nabla A'B'C'$
$A \rightarrow A'$
$(x, y) \rightarrow (x', y')$
$(x', y') = (ax, ay)$
similarity
ratio
proportion
corresponding parts
coordinate plane
length
width
base
height
radius
diameter
circumference
pi, Π

Essential Skills:

- **Determine how the perimeter, area and volume are affected when one or more dimensions are changed.**
- **Understand that when one or more dimensions changes, the area and volume are changed proportionally.**
- **Use ratios and similar figures to determine measurements that are difficult or inconvenient to find with direct measurement.**
- **Apply ratios, similarity, and proportional reasoning to solve problems.**
- **Apply formulas for finding area, perimeter/circumference, surface area and volume to solve problems.**
- **Apply properties of quadrilaterals to solve problems.**
- **Understand how the scale factor effects the coordinate points of a figure.**
- **Recognize that a transformation of the form (x', y') = (ax, ay) is a dilation that enlarges or reduces the figure by a factor of a.**
- **Use sample notation (see vocabulary bar) to describe**

Assessment Tasks:

Class Discussions/Philosophical Chairs/Socratic Seminar
Learning Logs
Cornell Notes
Think-Pair-Share
Concept Maps
Graphic Organizers
Interactive Notebook
Groupwork
Projects
Quickwrites
Foldables
RAFTS
Journals

	dilations. • **Use geometric models to find probability of an event** • **Use geometric models to determine the area/*perimeter* of inscribed figures and shaded regions** **Problem Solving Skills** • guess and test • make a table/chart/ • graph • make a diagram/picture • make an organized list • work backwards • work a simpler problem • extraneous information	

Materials Suggestions:

NCDPI Resources:
http://www.ncpublicschools.org/curriculum/mathematics/middlegrades/grade08/
http://mathlearnnc.sharpschool.com/cms/One.aspx?portalId=4507283&pageId=5149151
National Library of Manipulatives
http://nlvm.usu.edu/en/nav/vlibrary.html
NCTM Illuminations
http://illuminations.nctm.org/
Lesson Plan sites and Activities:
http://www.lessonplanspage.com/Math.htm
http://www.ilovemath.org
Math Graphic Organizers
http://www.enchantedlearning.com/graphicorganizers/math/

Problem Solving/Problem Websites
http://library.thinkquest.org/25459/learning/problem/
http://www.geom.uiuc.edu/~lori/mathed/problems/problist.html
http://www.rhlschool.com/math.htm
http://nces.ed.gov/nationsreportcard/itmrlsx/search.aspx

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