Unit 4 - Geometry & Measurement

Content Area: **Math**
Course(s): **Sample Course**
Time Period: **MarApr**
Length: **7 Weeks & Grade 6**
Status: **Published**

Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Geometry

Grade 6

Belleville Board of Education

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Unit Overview

After completing this unit 6th grade math students will be able to;

- Identify and label regular polygons
- Apply geometry and spatial sense to interpret and reflect on the physical world
- Reason, analyze and justify geometric relationships
- Calculate the area of triangles, rectangles and complex polygons including decomposing using triangles and rectangles.
- Determine surface area using nets of polygons
- Plot polygons on the coordinate plane
- Compute the volume of basic polyhedra
- Apply formulae to calculate and reason about perimeter, area and volume with whole number, fractional, and decimal side lengths

NJSLS

Please link all standards that apply in this section within the curriculum of the unit being written. Please include all New Jersey Student Learning Standards.

MA.6.G	Geometry
MA.6.G.A	Solve real-world and mathematical problems involving area, surface area, and volume.
MA.6.G.A.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
MA.6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
MA.6.G.A.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Exit Skills

By the end of this unit 6th grade math students should be able to:
Build on their work with area by reasoning about relationships among shapes to determine area, surface area, and volume.
Students find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles.
Uding these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface area of prisms and pyramids by decomposing them into pieces whose area they can determine. Students reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths.

Enduring Understanding

- Geometry and spatial sense offer ways to interpret and reflect on our physical environment
- Analyze geometric relationships develops reasoning and justification skills
- Triangles and rectangles can be used to find areas of other polygons
- Use nets of 3-D figures that can be used to find the surface area of a figure
- Surface area is related to the wrapping or covering of a surface with square units.
- Volume is related to the filling of space with cubic units

Essential Questions

- How do geometric models describe spatial relationships?
- How are geometric shapes and objects classified?
- Why would one want to calculate the aarea of polygons?
- How are areas of polygons found?
- How are volume and surface area of a right rectangular prism found?
- Why are volumes represented in cubic units?
- What is the connection between the net and surface area of 3-D figures?

Learning Objectives

- Find the area of right traingles, other triangles, special quadrilaterals and polygons by composing into rectangales or decomposing into triangles and other shapes; apply these techniques in the context of solving real world and mathematical problems.
- Find the volume of a right rectangular prism with frational edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism.
- Apply formulas to find the volumes of right rectangular prisms with fractional edge lengths in the context of solving real world and mathematical problems.
- Draw polygons in the coordinate plane given coordinates forthe vertices.
- Use coordinates to find the lengthnof a side joing points with the same first coordinate or the same second coordinate. Apply techniques learned to solve real world and mathematical problems.
- Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. and apply in the context of solving real world and mathematical problems.

Interdisciplinary Connections

Science

Social Studies

Health & Nutrition

Music

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21stcentury.

Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

21st Century/Interdisciplinary Themes

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

21st Century Skills

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

Technology Infusion

What technology can be used in this unit to enhance learning?

Differentiation

Resources:

- NJDOE: Instructional Supports and Scaffolds for Success in Implementing the Common Core State

Standards http://www.state.nj.us/education/modelcurriculum/success/math/k2/

Differentiation

- Pre-teach new vocabulary and meaning of symbols
- Connect new vocabulary and symbols to background knowledge and experience
- Break down terms to familiar parts, suffixes and prefixes
- Make dictionaries available to learners
- Increase experience to academic vocabulary and language
- Provide flash cards
- Incorporate as many learners senses as possible to enhance retentention
- Brainstorm examples of use of new terms or symbols making real world applications
- Engage student in relevant discussion about conceptual process
- Post and refer to math guides and anchor charts when applicable
- Clarify the relationships between the operations
- Develop graphic representations of math processes
- Make connections to formulas, concepts or structures preciously learned
- Utilize manipulatives to display structures
- Offer various ways to solve math problems
- Provide opportunities to integrate math, technology and art
- Provide graphic organizers and anchor charts for all symbols and formulas
- Create math journals for terms, formulas and symbols
- Develop interactive games and activities to promote retention
- Integrate videos
- Utilize graphics, diagrams, charts

Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length

- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- providing study guides
- tutoring by peers

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- providing study guides

- tutoring by peers
- using authentic assessments with real-life problem-solving
- using videos, illustrations, pictures, and drawings to explain or clarify

Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this secion.

- Admit Tickets
- Anticipation Guide
- Common benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Unit tests

Primary Resources

Carnegie Learning Textbook Course 1

Standards Solution

NJ Model Curriculum

PARCC/Pearson

Ancillary Resources

Dinah Zike's Foldables-Interactive Study Guides, Macmillan/MacGraw Hill

Glencoe/MacGraw Hill Workbooks

http://www.khanacademy.org

http://mathgoodies.com

http://purplemath.com

http://buzzmath.com

http://IXL.com/math

http://www.ncpublicschools.org/acre/standards/common-core-tools/

http://www.uen.org/commoncore/

http://www.parcconline.org/math-plds

http://www.parcconline.org/mcf/mathematics/parcc-model-content-frameworks-browser

http://ime.math.arizona.edu/progressions/

http://www.nciea.org/publications/Math_LPF_KH11.pdf

http://www.nciea.org/publications/Math%20Expanded%20LPF%205-8_KH11.pdf

http://www.corestandards.org/the-standards/mathematics

Dan Meyer's Three-Act Lessons
https://docs.google.com/spreadsheet/ccc?key=0AjIqyKM9d7ZYdEhtR3BJMmdBWnM2YWxWYVM1UWowTEE#gid=0

Sample Lesson

One Lesson per Curriculum must bein this lesson plan template. I.e. one lesson in one unit

Unit Name:

CCSS/NJCCCS:

Interdisciplinary Connection:

Statement of Objective:

Anticipatory Set/Do Now:

Learning Activity:

Student Assessment/CFU's:

Materials:

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: