Englewood Public School District
Mathematics
Grade 6
Fourth Marking Period

Unit – Area and Volume

Overview: During this unit, students will learn about surface area and volume of solids, introduction to statistics, and measures of central tendency.

Time Frame: Chapter 12 – 12 days, Chapter 13 - 10 days, Chapter 14 - 18 days,

Enduring Understandings:
Area is measured in square units, and the surface area of a prism or pyramid is the sum of the areas of its faces.
Volume is measured in cubic units, and the volume of a prism is the area of its base times its height.
Statistics summarize data so that information or decisions can be gathered from the data.
Measures of central tendency can be used to summarize data distributions, and help you make decisions in real-world problems.

Essential Questions:
How can nets be used to find surface area?
What is a statistical question?
How can data be interpreted using center, spread, and overall shape?
How does a measure of center for numerical data differ from a measure of variation?
How can data be displayed?
How does an outlier affect the overall pattern in a set of data?

Standards	Topics and Objectives	Activities	Resources	Assessments / Alternative Assessments
Chapter 12				
6.EE.A.1. **Write and evaluate numerical expressions involving whole-number exponents.** 6.EE.A.2. **Write, read, and evaluate expressions in which letters stand for numbers.** **c. Evaluate expressions at**	**Topics** Nets of solids, surface area of solids, volume of prisms, and real-world problems with surface area and volume. Twenty-First Century Themes and Skills include:	6.G.A.2 Volumes with Fractional Edge Lengths 6.G.A.4 Nets for Pyramids and Prisms **Math Playground** http://www.mathplayground.com/	**SE-6B:** 172-213 **My HRW** - Online access to all Math in Focus materials listed above and Virtual Manipulatives **Technology Resources** • Math in Focus eBooks	**Unit 4 Benchmark Assessment:** Exact Path **Formative Assessments:** Math journal (NJSLSA.R1, NJSLSA.W2,

specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V=s^3$ and $A=6s^2$ to find the volume and surface area of a cube with sides of length s=1/2.*

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 = l w h* and *V = b h* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.**

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.**

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration

Objectives

The students will be able to:

- Identify the net of a prism and a pyramid.
- Identify the solid formed by a given net.
- Find the surface area of a prism and a pyramid.
- Find the volume of a prism.
- Solve problems involving surface area and volume of prisms.
- Reinforce, consolidate, and extend chapter skills and concepts.

Math Fact Practice
http://www.playkidsgames.com/games/mathfact/mathFact.htm

Grades 6-8 Math Fluency Support
https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8

Brain Genie
http://braingenie.ck12.org/

Math Game Time
http://www.mathgametime.com/

Area and volume activities (scroll down for free items):
https://www.teacherspayteachers.com/Browse/Search:surface%20area%20and%20volume%20activities/Grade-Level/Sixth/Price-Range/Free
(CRP2)

Covering and filling – lesson and activity:
https://betterlesson.com/lesson/443463/covering-and-filling-surface-area-and-volume-of-rectangular-prisms
(CRP2)

Surface area and volume interactive tool:
http://www.shodor.org/intera

- Math in Focus Teacher Resources CD
- Interactive Whiteboard lessons
- Virtual Manipulatives
- Online Professional Development Videos

North Carolina Dept of Ed. Wikispaces:
http://maccss.ncdpi.wikispaces.net/Middle+School

Math Goodies – Math Lessons
http://www.mathgoodies.com/

Standards Solution Lessons:

- **PARCC Lesson 17:** Practice PARCC Type I Geometry
- **CCSS Prescriptive Lesson Plan:** Evaluating Exponents
- **CCSS Prescriptive Lesson Plan:** Calculating Area

6th grade assessments, interactive, videos, games, lessons, homework:
https://www.opened.com/search?area=mathematics&grade=6&offset=0&resource_type=interactive-assessment
(CRP2, CRP4, CRP8, 8.1.8.A.1)

6th grade worksheets, games, lessons, activities:
https://www.education.com/r

NJSLSA.L1)

Multiple choice / short answer assessments (CRP8)

Mini quizzes – assess just one topic, or what was done within 1 or 2 days (CRP8)

Summative Assessments:

Math in Focus Assessments

SE/TE: pp. 209, 210–213, Items: 1–10

Assessments Course 1: Chapter 12
Test A pp. 126–127, Items: 1–5;
Test B pp. 130–131, Items: 1–5

ExamView Assessment Suite – Test and Practice Generator

Alternative Assessments: Learning centers: each learning center focuses on a different type of problem (CRP8)

Create posters illustrating the main objectives of the unit
(RH.6-8.7)

Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8		ctivate/activities/SurfaceAreaAndVolume/ (8.1.8.A.1) **Everything you need to know about math journals:** https://thecornerstoneforteachers.com/math-journals/ (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1) **Additional texts:** www.newsela.com www.readworks.org www.commonlit.org	esources/math/middle-school/ (CRP2, CRP4, CRP8, 8.1.8.A.1) **6th grade worksheets:** https://www.k5learning.com/free-math-worksheets/sixth-grade-6 (CRP2, CRP4, CRP8) **6th grade common core worksheets:** https://www.ixl.com/math/grade-6 (CRP2, CRP4, CRP8) **Khan Academy – videos, lessons, assessments** www.khanacademy.org (8.1.8.A.1)	Create a dictionary defining and illustrating vocabulary terms (RH.6-8.7) Create posters illustrating the main objectives of the unit (RH.6-8.7) Create displays of prime factorizations (RH.6-8.7)

Chapter 13

6.SP.A.1. **Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.** ***For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in***	**Topics** Collecting and tabulating data, dot plots, and histograms. Twenty-First Century Themes and Skills include: • Creativity and Innovation • Critical Thinking and Problem Solving	6.SP.A.1 Identifying Statistical Questions 6.SP.A.2, 6.SP.B.4 Puppy Weights **Math Playground** http://www.mathplayground.com/ **Math Fact Practice**	**SE-6B:** 217-241 **My HRW** - Online access to all Math in Focus materials listed above and Virtual Manipulatives **Technology Resources** • Math in Focus eBooks • Math in Focus Teacher Resources CD	**Formative Assessments:** Math journal (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1) Multiple choice / short answer assessments (CRP8)

students' ages.

6.SP.A.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.B.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.B.5. Summarize numerical data sets in relation to their context, such as by:
a. Reporting the number of observations.
b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement
d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Mathematical Practices
MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

- Communication and Collaboration

Objectives

The students will be able to:

- Collect, organize and tabulate data.
- Display and analyze data using a dot plot.
- Display and analyze data using a histogram.
- Reinforce, consolidate, and extend chapter skills and concepts.

http://www.playkidsgames.com/games/mathfact/mathFact.htm

Grades 6-8 Math Fluency Support
https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8

Brain Genie
http://braingenie.ck12.org/

Math Game Time
http://www.mathgametime.com/

Everything you need to know about math journals:
https://thecornerstoneforteachers.com/math-journals/
(NJSLSA.R1, NJSLSA.W2, NJSLSA.L1)

Dot plots and histograms – lesson and activities:
http://www.cpalms.org/Public/PreviewResourceLesson/Preview/71617
(NJSLSA.R1, CRP2)

Comparing data displays – lesson and worksheet:
https://www.wccusd.net/cms/lib/CA01001466/Centricity/domain/60/lessons/grade%206%20lessons/ComparingDataDisplays.pdf

- Interactive Whiteboard lessons
- Virtual Manipulatives
- Online Professional Development Videos

North Carolina Dept of Ed. Wikispaces:
http://maccss.ncdpi.wikispaces.net/Middle+School

Math Goodies – Math Lessons
http://www.mathgoodies.com/

Standards Solution Lessons:

- **CCSS Lesson Plan:** Analyzing the Effects of Sample Size
- **CCSS Lesson Plan:** Finding Center
- **CCSS Lesson Plan:** Graphically Representing Data
- **CCSS Lesson Plan:** Recognizing the Best Data Displays for Statistical Questions
- **CCSS Lesson Plan:** Recognizing and Creating Statistical Questions
- **CCSS Lesson Plan:** Statistical and Non-statistical Questions
- **CCSS Lesson Plan:** Summarizing Data in Content
- **CCSS Lesson Plan:** Creating a Box Plot
- **CCSS Lesson Plan:** Creating a Histogram

Mini quizzes – assess just one topic, or what was done within 1 or 2 days (CRP8)

Summative Assessments:

Math in Focus Assessments

SE/TE: pp. 238, 239–241

Assessments Course 1: Chapter 13
Test A pp. 135–138;
Test B pp. 139–142

ExamView Assessment Suite – Test and Practice Generator

Alternative Assessments:
Learning centers: each learning center focuses on a different type of problem (CRP8)

Create posters illustrating the main objectives of the unit
(RH.6-8.7)

Create a dictionary defining and illustrating vocabulary terms
(RH.6-8.7)

Create posters illustrating the main objectives of the unit

		(NJSLSA.R1, CRP2) **Create histograms interactive tool:** https://www.mathgames.com/skill/6.130-create-histograms (8.1.8.A.1) **Additional texts:** www.newsela.com www.readworks.org www.commonlit.org	• **CCSS Lesson Plan:** Describing Graphed Data • **CCSS Prescriptive Lesson Plan:** Identifying Statistical Questions • **CCSS Prescriptive Lesson Plan:** Displaying Numerical Data • **CCSS Prescriptive Lesson Plan:** Summarizing Data **6th grade assessments, interactive, videos, games, lessons, homework:** https://www.opened.com/search?area=mathematics&grade=6&offset=0&resource_type=interactive-assessment (CRP2, CRP4, CRP8, 8.1.8.A.1) **6th grade worksheets, games, lessons, activities:** https://www.education.com/resources/math/middle-school/ (CRP2, CRP4, CRP8, 8.1.8.A.1) **6th grade worksheets:** https://www.k5learning.com/free-math-worksheets/sixth-grade-6 (CRP2, CRP4, CRP8) **6th grade common core worksheets:** https://www.ixl.com/math/grade-6	(RH.6-8.7) Create displays of prime factorizations (RH.6-8.7) Have the students conduct their own survey of the class (or multiple classes) and then display their results as a histogram (CRP6)

			(CRP2, CRP4, CRP8) **Khan Academy – videos, lessons, assessments** www.khanacademy.org (8.1.8.A.1)	

Chapter 14

Note: It is recommended that additional lessons be taught for the following standards. The lessons are listed in the Resources column and are located in the Online Common Core Additional Resources. 6.SP.A.2. **Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.** 6.SP.A.3. **Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.** 6.SP.B.4. **Display numerical data in plots on a number line, including dot plots, histograms, and box plots.**	**Topics** Mean, median, mode and real-world problems using mean, median and mode. Twenty-First Century Themes and Skills include: • Creativity and Innovation • Critical Thinking and Problem Solving Communication and Collaboration **Objectives** The students will be able to: • Find the mean of a set of data. • Use the mean of a set of data to solve problems. • Find the median of a set of data. • Use the median of a set of data to solve problems. • Find the mode of a set of data.	6.SP.A.3 Is It Center or Is It Variability? 6.SP.B.5c Number of Siblings 6.SP.B.5d Mean or Median? **Math Playground** http://www.mathplayground.com/ **Math Fact Practice** **http://www.playkidsgames.com/games/mathfact/mathFact.htm** **Grades 6-8 Math Fluency Support** https://www.engageny.org/resource/mathematics-fluency-support-grades-6-8 **Brain Genie** http://braingenie.ck12.org/ **Math Game Time** http://www.mathgametime.com/	**SE-6B:** 244-279 ***Online Common Core Additional Resources for Course 1:*** 9.1 Interpreting Quartiles and Interquartile Range ***Online Common Core Additional Resources for Course 1:*** 9.3 Understanding Box Plots and Mean Absolute Deviation **My HRW** - Online access to all Math in Focus materials listed above and Virtual Manipulatives **Technology Resources** • Math in Focus eBooks • Math in Focus Teacher Resources CD • Interactive Whiteboard lessons	**Formative Assessments:** Math journal (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1) Multiple choice / short answer assessments (CRP8) Mini quizzes – assess just one topic, or what was done within 1 or 2 days (CRP8) **Summative Assessments:** **Math in Focus Assessments** **SE/TE:** pp. 272–274, 275–279 **Assessments Course 1: Chapter 14** Test A pp. 144–148; Test B pp. 149–153 **Assessments Course 1:**

6.SP.B.5. Summarize numerical data sets in relation to their context, such as by: **a. Reporting the number of observations.** **b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement** **c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.** **d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.** *Mathematical Practices* MP.1, MP.2, MP.3**, MP.4**, MP.5, MP.6, MP.7, MP.	• Use the mode of a set of data to solve problems. • Solve problems that are related to the concepts of mean, median, and mode, including selection of the measure of central tendency to be used for problems. • Reinforce, consolidate, and extend chapter skills and concepts.	**Everything you need to know about math journals:** https://thecornerstoneforteachers.com/math-journals/ (NJSLSA.R1, NJSLSA.W2, NJSLSA.L1) **Analyze this – lesson and worksheet:** https://betterlesson.com/lesson/435751/analyze-this-mean-median-mode-and-range (NJSLSA.R1, CRP2) **Additional texts:** www.newsela.com www.readworks.org www.commonlit.org	• Virtual Manipulatives • Online Professional Development Videos **North Carolina Dept of Ed. Wikispaces:** **http://maccss.ncdpi.wikispaces.net/Middle+School** **Math Goodies – Math Lessons** **http://www.mathgoodies.com/** **Standards Solution Lessons:** **PARCC Lesson 18:** Practice PARCC Type I Statistics and Probability **6th grade assessments, interactive, videos, games, lessons, homework:** https://www.opened.com/search?area=mathematics&grade=6&offset=0&resource_type=interactive-assessment (CRP2, CRP4, CRP8, 8.1.8.A.1) **6th grade worksheets, games, lessons, activities:** https://www.education.com/resources/math/middle-school/ (CRP2, CRP4, CRP8, 8.1.8.A.1) **6th grade worksheets:** https://www.k5learning.com/free-math-worksheets/sixth-grade-6	**End-of-Course** Test A pp. 154–164; End-of Course Test B pp. 165–176 ***Online Common Core Additional Resources for Course 1:*** Chapter 9 Statistics Review/Test: Items: 1–7, 10–27 ***Online Common Core Additional Resources for Course 1:*** Assessments Chapter 9 Test A Items: 1–5, 9–10; Test B Items: 1–5, 7–8 ExamView Assessment Suite – Test and Practice Generator **Alternative Assessments:** Learning centers: each learning center focuses on a different type of problem (CRP8) Create posters illustrating the main objectives of the unit (RH.6-8.7) Create a dictionary defining and illustrating vocabulary terms

		(CRP2, CRP4, CRP8) **6th grade common core worksheets:** https://www.ixl.com/math/grade-6 (CRP2, CRP4, CRP8) **Khan Academy – videos, lessons, assessments** www.khanacademy.org (8.1.8.A.1)	(RH.6-8.7) Create posters illustrating the main objectives of the unit (RH.6-8.7) Create displays of prime factorizations (RH.6-8.7)

Key Vocabulary:
Chapter 12:
net, pyramid, surface area, cross section

Chapter 13:
frequency, dot plot, skewed, symmetrical, range, histogram, outlier

Chapter 14:
mean, median, mode

NJ Learning Standards Vocabulary:
6.EE.A.1 & 2
Apply and extend previous understanding of arithmetic to algebraic expressions.
exponents, base, numerical expressions, algebraic expressions, evaluate, sum, term, product, factor, quantity, quotient, coefficient, constant, like terms, equivalent expressions, variables

6.G.A.2 & 4
Solve real-world problems involving area, surface area, and volume.
area, surface area, volume, decomposing, edges, dimensions, net, vertices, face, base, height, trapezoid, isosceles, right triangle, quadrilateral, rectangles, squares, parallelograms, trapezoids, rhombi, kites, right rectangular prism, diagonal

6.SP.A.1, 2, & 3
Develop understanding of statistical variability.

statistics, data, variability, distribution, dot plot, histograms, box plots, median, mean

6.SP.B.4 & 5
Summarize and describe distributions.
this cluster are: box plots, dot plots, histograms, frequency tables, cluster, peak, gap, mean, median, interquartile range, measures of center, measures of variability, data, Mean Absolute Deviation (M.A.D.), quartiles, lower quartile (1st quartile or Q1), upper quartile (3rd quartile or Q3), symmetrical, skewed, summary statistics, outlier

Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered. Additional staff should be included so all students can fully participate in the standards associated with this curriculum.

ELL/ESL students: Students will be supported according to the recommendations for "can do's" as outlined by WIDA - https://www.wida.us/standards/CAN_DOs/

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure. Student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges.

English Language Learners:	**Special Education:**	**At-Risk:**	**Gifted and Talented:**
• Teaching modeling • Peer modeling • Word walls • Give directions in small steps and in as few words as possible • Provide visual aids • Group similar problems together • Repeat directions when necessary • Provide a vocabulary list with definitions	• Utilize modifications & accommodations delineated in the students' IEP • Work with paraprofessional • Work with a partner • Shorten assignments to focus on mastery or key concepts • Maintain adequate space between desks • Keep workspaces clear of unrelated materials • Provide fewer problems to attain passing grades	• Use visual demonstrations, illustrations and models • Give directions / instructions verbally and in simple written format • Peer support • Increased one – on – one time • Teachers may modify instructions by modeling what the student is expected to do • Instructions may be printed out in large print and hung	• Inquiry based instruction • Independent study • Higher order thinking skills • Adjusting the pace of the lessons • Real world scenarios • Student driven instruction • Allow students to complete an independent project as an alternative test

	• Tape a number line to the student's desk • Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments • Provide extra time to complete a task when needed • Provide definitions of different graphs / charts with illustrations • Allow tests to be taken in a separate room • Allow students to use a calculator when appropriate • Divide test into small sections of similar questions or problems	up for the students to see during the time of the lesson • Review behavior expectations and make adjustments • Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments • Allow students to complete an independent project as an alternative test	

Interdisciplinary Connections: ELA

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content
NJSLSA.L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking
RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos or maps) with other information in print and digital texts

Integration of Technology Standards NJSLS:

8.1.8.A.1: Demonstrate knowledge of a real world problem using digital tools.

21st century standards

9.2.8.B.1: Research careers within the 16 Career Clusters and determine attributes of career success.
9.2.8.B.2: Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of

interest, goals and an educational path.
9.2.8.B.3: Evaluate communication, collaboration and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Career Ready Practices:

CRP2: Apply appropriate academic and technical skills
CRP4: Communicate clearly and effectively and with reason
CRP6: Demonstrate creativity and innovation
CRP8: Utilize critical thinking to make sense of problems and persevere in solving them

Major Supporting Additional (Identified by PARCC Model Content Frameworks)