

Common Core Instructional Tools:

For special education teachers whose students will be assessed using the next generation of alternate assessment based on alternate achievement standards. These materials align with the Common Core State Standards and the Dynamic Learning Maps Essential Elements and are created specifically for use with students with severe cognitive disabilities.



Mathematics

Grade: HS Geometry



North Dakota Department of Public Instruction
Kirsten Baesler, State Superintendent
Offices of Special Education and Assessment
600 E. Boulevard Avenue., Dept. 201
Bismarck, North Dakota 58505-0440

www.dpi.state.nd.us

701-298-4637 (voice)

701-328-2277 (voice)

701-328-4920 (TDD)

701-328-4149 (Fax)

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This resource is the result of a collaborative effort of North Dakota Teachers, the Dynamics Learning Maps Alternate Assessment Consortium materials, the North Dakota Curriculum Initiative project, and the North Dakota Department of Public Instruction. We would like to thank the following educators for their dedication and diligence in working on these instructional materials to provide tools to help special education teachers whose students will take the alternate assessment based on alternate achievement standards and the Common Core State Standards.

North Dakota Educators:

Beth Jones

Special Education Coordinator
Bismarck Public Schools

Ruth Carnal

Secondary Transition Teacher
Fargo Public Schools

Karen Thompson

Special Education Consultant
Dickinson Public Schools

Susan Dopp

Middle School Special Education Teacher
Lisbon Public Schools

Dan Juve

Special Education Coordinator
Grand Forks Public Schools

Annette Kost

School Psychologist
Morton Sioux Special Education Unit

Victoria Sculley

Special Education Teacher
Pembina Special Education Unit

Mike Cerkowniak

Special Education Teacher
Griggs-Steele-Trail Special Education Unit

Sheryl Nesseth

4th Grade Teacher
Grand Forks Public Schools

Ann Durbin

5th Grade Teacher
Fargo Public Schools

Karen Hess

Special Education Coordinator
Jamestown Special Education Unit

Danica Nelson

High School Special Education Teacher
Bismarck Public Schools

Carlene Gustafson

Middle School Special Education Teacher
West Fargo Public Schools

Cindy Creviston

High School Special Education Teacher
Sheyenne Valley Special Education Unit

Lucilla Barth

Elementary Teacher
Mandan Public Schools

Pam Aman

Literacy Specialist
Junior High Dickinson Public Schools

Traci Peterson

Education Specialist - School Psychologist
Standing Rock Special Education Unit

Pam Aadnes

High School Special Education Teacher
Bismarck Public Schools

Gary Jackson

Math and Visual Impairments Teacher
Valley-Edinburg Public Schools

Toni Gredesky

High School Library Sciences
Wahpeton Public Schools

Laura Mildenberger

Secondary Transition Teacher
Bismarck Public Schools

Marsha Knutson

Special Education Director
Northern Plains Special Education Unit

Pat Drege

Elementary Teacher
Fargo Public Schools

Linsey Schott

Special Education Coordinator
James River Special Education Unit

Project Manager:

Doreen Strode, Assistant Director - Alternate Assessments
North Dakota Department of Public Instruction
State of North Dakota

Resources:

- **Common Core State Standards** documents at http://www.dpi.state.nd.us/standard/common_core.shtm
- **North Dakota Curriculum Initiative** documents at http://ndcurriculuminitiative.org/common_core
- **Dynamic Learning Maps**<http://dynamiclearningmaps.org/>
Common Core Essential Elements and Assessment Achievement Level Descriptors
Dynamic Learning Maps Essential Elements Versions 1 and 2
- **Kansas State Education Department** website: <http://www.ksde.org/>
- **Microsoft Office Clip Art**

Document Description:

This document is arranged by grade level so that teachers can access a single grade or multiple grades as needed. These materials are based on the Common Core State Standards and align with the Dynamic Learning Maps Essential Elements. North Dakota is a member of the Dynamic Learning Maps (DLM) Consortium of states creating the next generation of alternate assessments based on alternate achievement standards for assessing students with severe cognitive disabilities.

These materials are created by North Dakota teachers, for teachers, to assist them in accessing the Common Core State Standards in a meaningful fashion. Our goal was to provide teachers of students with severe cognitive disabilities with tools to get them started with the Common Core. They are intended to be tools for teachers to start with and build upon within their own local curriculum. They are not mandatory, but because they are linked to the DLM Essential Elements, they may be helpful in teaching the new standards which will begin to be assessed in 2014-15.

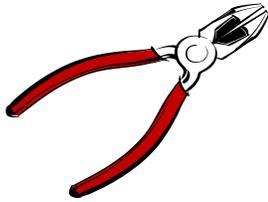
These tools are:

- ✓ Resources for teachers to use to access the Common Core State Standards (CCSS)
- ✓ Linked to the Dynamic Learning Maps (DLM) "Essential Elements"
- ✓ Ideas for learning activities based on CCSS
- ✓ Ideas on how to collect data on student performance
- ✓ Ideas on how to plan collaboration activities with general educators
- ✓ Resources to plan for "Communication Opportunities" for students who are learning a communication mode

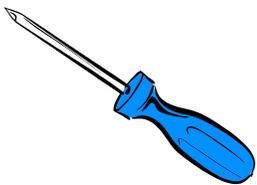
These tools are not:

- ✓ Not meant for test preparation purposes
- ✓ Not mandatory for use by educators
- ✓ Not meant to serve as curriculum

TOOLS FOR TEACHERS



Element Cards - A collection of Common Core State Standards materials specific to the Dynamic Learning Maps Essential Elements at each grade. These are meant to provide you with instructional ideas, key vocabulary, real world connections, and mapping of the concept the grade before and the grade after.



Educator Collaboration Plan - Planning sheets to prepare students for communication needs and for data collection in general education settings. Communication is key in teaching and assessing all students and especially those with severe cognitive disabilities. If a student does not have a consistent and reliable means of communicating what he/she knows and is able to do, it is very difficult to measure progress. More importantly, lack of a consistent communication system (high tech, low tech, or no tech) will affect the student's entire life in a negative way.



"I Can" Checklist - data sheet template for teacher use.



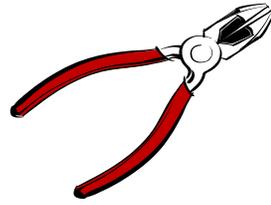
Website Resources - lists of web addresses where a variety of educational ideas can be found.

Element Card-Tool #1

Grade 6 ELA

Strand: Reading Literature

Cluster: Key Ideas and Details



(Element card number) **RL.6.1**

Standard RL.6.1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (This is the grade level Common Core State Standard for this concept)	Essential Element: Analyze the text to determine what it says explicitly and what inferences must be drawn. (An Essential Element is a term used by Dynamic Learning Maps Consortium identifying 'specific knowledge and skills linked to the grade-level expectations identified in the Common Core State Standards')
Grade 5 Expectations: (What is related to this standard in the prior grade)	Grade 7 Expectations: (What is related to this standard in the next grade)
I Can Statements: (Statements of measures of specific skills related to this standard)	
Key Vocabulary: (Grade level vocabulary related to specific content in this standard)	Supports (specific to student): (IEP accommodations, assistive technology, communication system, visual aids, templates, active board, highlighters, etc.)
Instructional Examples: (Examples of activities that can be done to address this skill such as modeling, small group discussions, etc.)	
Real World Connections: (Activities from everyday life that relate to the content of this standard)	
Resources: (Educational materials or websites that can be accessed for ideas that may support this standard)	

Note: If the Essential Element says "Not Applicable" that means that the Dynamic Learning Maps Consortium did not address this Essential Element.

If the Essential Element says "See EE of a different number" (e.g. S-ID.2) that means that there is another Element Card that addresses some of this standard.

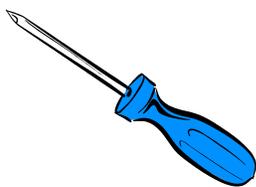
The Essential Elements are highlighted to indicate the importance of their focus.

These are the **Dynamic Learning Maps Claims and Conceptual Areas in Mathematics**.

This document was used by ND teachers who worked on these Tools. The Element cards may correlate or in some cases may not. High School divided the math documents into Consumer Math (measurement and data analysis and number sense), Algebra, and Geometry.

<p>Claim 1</p>	<p>Number Sense: Students demonstrate increasingly complex understanding of number sense.</p> <p>Conceptual Areas in the Dynamic Learning Map:</p> <p>MC 1.1 Understand number structures (counting, place value, fraction) <i>Essential Elements Included:</i> K.CC.1.4 ,5; 1.NBT.1a-b; 2.NBT.2a-b,3; 3.NBT.1,2,3; 4.NBT.3; 3.NF.1-3; 4.NF.1-2,3; 5.NF.1,2; 6.RP.1; 7.RP.1-3; 7.NS.2.c-d; M.EE.8.NS.2.a</p> <p>MC 1.2 Compare, compose, and decompose numbers and sets <i>Essential Elements Included:</i> K.CC.6; 1.NBT.2, 3, 4, 6; 2.NBT.1, 4, 5b; 4.NBT.1, 2; 5.NBT.1, 2, 3, 4; 6.NS.1, 5-8; 7.NS.3; 8.NS.2.b; 8.EE.1-4</p> <p>MC 1.3 Calculate accurately and efficiently using simple arithmetic operations <i>Essential Elements Included:</i> 2.NBT.5.a, 6-7; 3.OA.4; 4.NBT.4, 5, 6-7; 6.NS.2, 3; 7.NS.1, 2a, 2b; 8.NS.1;8.EE.1; HS.N-CN.2, 2.a, 2.b; HS.N-RN.1; HS.S-CP.1-5; HS.S-IC.1-22</p>
<p>Claim 2</p>	<p>Geometry: Students demonstrate increasingly complex spatial reasoning and understanding of geometric principles.</p> <p>Conceptual Areas in the Dynamic Learning Map:</p> <p>MC 2.1 Understand and use geometric properties of two- and three-dimensional shapes <i>Essential Elements Included:</i> K.MD.1; K.G.2-3; 1.G.1, 2; 2.G.1; 3.G.1; 4.G.1, 2, 2a, 2b; 5.G.1-4; 5.MD.3; 7.G.1, 2, 3, 5; 8.G.1, 2, 4, 5; HS.G-CO.1, 4-5; 6-8; HS.G-GMD.1-3, 4</p> <p>MC 2.2 Solve problems involving area, perimeter, and volume <i>Essential Elements Included:</i> 1.G.3; 3.G.2; 4.G.3; 4.MD.2; 5.MD.4-5; 6.G.1, 2; 7.G.4, 6; 8.G.9; HS.G-GMD.1-3; HS.G-GPE.7</p>
<p>Claim 3</p>	<p>Measurement Data and Analysis: Students demonstrate Increasingly complex understanding of measurement, data, and analytic procedures.</p> <p>Conceptual Areas in the Dynamic Learning Map:</p> <p>MC 3.1 Understand and use measurement principles and units of measure <i>Essential Elements Included:</i> 1.MD.1-2, 3a, 3b, 3c, 3d; 2.MD.1, 3-4, 5, 6, 7, 8; 3.MD.1, 2, 4; 4.MD.1, 2a, 2b, 2c, 2e; 5.MD.1a, 1b, 1c; HS.N-Q.1-3</p> <p>MC 3.2 Represent and interpret data displays <i>Essential Elements Included:</i> 1.MD.4; 2.MD.9-10; 3.MD.3; 4.MD.4a, 4b; 5.MD.2; 6.SP.1-2, 5; 7.SP.1-2, 3, 5-7; 8.SP.4; HS.S-ID. 1-2, 3, 4</p>
<p>Claim 4</p>	<p>Algebraic and functional reasoning: Students solve increasingly complex mathematical problems, making productive use of algebra and functions.</p> <p>Conceptual Areas in the Dynamic Learning Map:</p> <p>MC 4.1. Use operations and models to solve problems <i>Essential Elements Included:</i> K.OA.1, 1a, 1b, 2, 5a, 5b; 2.OA.1, 3, 4; 3.OA.1-2, 8; 4.OA.1-2, 3, 4; 6.EE.1-2, 3, 5-7; 7.EE.1-2, 4; 8.EE.7; HS.A-CED.1, 2-4; HS.A-SSE.1, 3</p> <p>MC 4.2 Understand patterns and functional thinking <i>Essential Elements Included:</i> 3.OA.9; 4.OA.5; 5.OA.3; 7.EE.3; 8.EE.5-6; 8.F.1-3, 4, 5; HS.A-REI.10-12; HS.A-SSE.4; HS.F-BF.1, 2; HS.F-IF.1-3, 4-6; HS.F-LE.1</p>

A-CED= creating equations; A-SSE = seeing structure in equations BF= building functions; CC= counting & cardinality; EE = expressions & equations; F-BF = basic fractions; F-IF = interpreting functions; G = geometry; G-GMD=geometric measurement & dimension; G-GPE = general properties & equations: MD= measurement & data; NBT= numbers and operations in base ten; N-CN=complex number system; NF= numbers & operations - fractions; N-RN=real number system; NS= number systems; N-Q= number & quantity; OA = operations & algebraic thinking; RP = ratios & proportional relationships; S-IC- statistics & probability - making inferences/justifying conclusions; S-ID=statistics & probability – interpreting categorical & quantitative data: SP = statistics & probability



Tool # 2 - Educator Collaboration Plan:

This plan is a tool that can be utilized to prepare students and their paraprofessionals for fuller participation in general education classes and an increased communication expectation.

Remember - If communication is planned for, it is much more likely to happen.

Keep the student's Speech Pathologist in the loop so he/she can support and participate in these collaboration efforts.

Suggested Use of this tool:

Meet with the general education teacher once a week (maybe the Thursday before) and identify what concepts he/she will be covering the following week.

1. Fill in the first box (Monday through Friday) with the gen. ed. class lesson plan concepts. (See Sample)
2. Discuss Common Core State Standards (CCSS) being covered. Fill in box two. (See Sample)
3. Communication Plan: Identify the concepts and key words that will be covered in each lesson and identify what you want the student to be able to communicate in class. (See Sample)

Discuss with gen. ed. teacher which concepts student needs to answer during class. Identify (for example) two specific questions he/she will ask the student so the teacher knows ahead of time. If the plan is that the student needs to answer two questions during class every day and the questions are determined ahead of time (so the answers can be made available for the student to use) then expecting student participation becomes second nature.

Talker: preprogram it and allow student to practice ahead of time.

Pictures: prepare the pictures prior to class and practice.

Switches: program choices ahead of time and practice.

4. Identify what accommodations are listed in IEP to be used in the educational setting and make sure the student has them available. (See Sample)
5. Data Collection: Para collects data on the concepts. This can be a plus or minus per questions or item in this section. (See Sample)
6. Para or student brings an extra copy of the plan at the beginning of class on Monday. Para keeps the other copy as a working copy for the week. The copy needs to be brought back to you (special education teacher) so that you are aware of both the success and have data to work with. You will also be able to

see where the student excels or may be struggling. Share this data with the student's Speech Pathologist so he/she is aware of progress and possible problems.

7. Notes section allows Para to identify anything that needs to be brought to your attention. For example, student was distracted, or ill, or something interfered with the lesson getting finished. Para: Don't be afraid to remind the teacher in case he/she forgets to ask a question (even after the class has ended) rather than "just skipping it". Students need to be able to demonstrate their competence and it is not ok to have lower expectations for some students than others.

Educator Collaboration Plan

Gen. Ed. Contact: _____

Name: _____ Week Of: _____

Subject: _____

Gen Ed. Concepts Planned:

Mon.

Tues.

Wed.

Thurs.

Fri.

CCSS Addressed:

Communication Plan:

Mon.

Tues.

Wed

Thurs

Fri.

Accommodations in IEP:

Data Collection:

Mon. _____

Tues. _____

Wed. _____

Thurs. _____

Fri. _____

Notes:

Educator Collaboration PlanName: SampleWeek Of: Oct. 7 to 11, 2013Gen. Ed. Contact: Mrs. JonesSubject: Math

<p>Gen Ed. Concepts Planned:</p> <p>Mon. Fractions – whole, half, quarter</p> <p>Tues. Fractions – quarters, thirds 1/3, 2/3, 3/3 1/4, 2/4, 3/4, 4/4</p> <p>Wed. Halves, quarters, thirds review</p> <p>Thurs. Fractions project (demonstrate understanding of "equal parts" of a whole)</p> <p>Fri. Quiz on whole, halves, thirds, & quarters</p>	<p>CCSS Addressed:</p> <p>1.G.3 Partition circles and rectangles into two and four equal shares using the words halves, fourths, and quarters.</p>	<p>Communication Plan: Pre-program Alpha Talker daily before class (allow student to practice before class).</p> <p>Mon. "That is a whole" "whole" "That is a half" "one-half" That is a quarter" "one-quarter"</p> <p>Tues. " That is" "One-third" "two-thirds" "whole" "One-fourth" "one-half" "three-quarters"</p> <p>Wed. Same as Mon and Tues</p> <p>Thurs. "I have two fractions in my demonstration." "One half, and half of that is one fourth."</p> <p>Fri. Use words from Mon. and Tuesday for Quiz.</p>
<p>Accommodations in IEP:</p> <p>Alpha Talker is communication mode and requires that specific terms and sentences are programmed into the device prior to class.</p> <p>Para will accompany student to class and will be responsible to pre-program Talker with two specific answers according to the Collaboration Plan.</p> <p>Data will be collected on comm. performance and accuracy by Para.</p>	<p>Data Collection:</p> <p>Mon. whole__ half __ quarter__</p> <p>Tues. whole__ half__ 1/4__ 1/3__ 2/3__ 3/4__</p> <p>Wed. whole__ half__ 1/4__ 1/3__ 2/3__ 3/4__</p> <p>Thurs. half__ 1/4__ Used both sentences in demo __</p> <p>Fri. whole__ half__ 1/4__ 1/3__ 2/3__ 3/4__</p>	<p>Notes:</p> <p>Quiz (Friday) may need to be taken in an area where other students cannot hear the answers.</p> <p>Para writes student's answers and gen. ed. teacher corrects quiz.</p>



Tool # 4 - Resources

A Few Communication Resources (See also Resources at end of each grade)

1. <http://www.designtolearn.com>: A good site for introducing communication systems—knowing which ones to use, etc.
2. <http://www.alltogetherwecan.com/2008/06/02/ablenet-how-to-videos-step-by-step-with-levels/>: A set of videos on how to set up communication systems
3. http://www2.edc.org/NCIP/tour/Resources_PictureSym.html: A good overview of how to set up picture communication systems.
4. <http://www.pdictionary.com>: A large, easily searchable library of various pictures for instruction. This website may be used for students of various communication levels.
5. <http://www.tsbvi.edu/component/content/article/53/1116-tactile-symbols-directory-to-standard-tactile-symbol-list>: From Texas School for the Blind and Visually Impaired. This site offers information on developing and using tactile symbols.
6. <http://bookbuilder.cast.org/>: From cast.org—a free resource that allows you or your students to build books online. It provides text to speech and animation for the books so your students can listen to and watch the book. Can also access books others have written. Great if you are creating a modified version of a grade level text.
7. <http://aex.intellitools.com/>: Collection of free IntelliKeys activities posted by other teachers.
8. <http://teachinglearnerswithmultipleneeds.blogspot.com/2008/02/free-boardmaker-boards-and-activities.html>: Collection of free Boardmaker boards. Excellent if you already have Boardmaker. Not all of the links work though.
9. <http://zacbrowser.com/>: An internet engine designed for children with autism.



Tool # 3 - I Can Statements Checklist

Grade 2 Math “I Can” Statements Checklist

Instructions: These checklists are meant to provide a visual to record progress toward Common Core Standard Skills.

Domain: Operations and Algebraic Thinking	Cluster: Work with equal groups of objects to gain foundations for multiplication	Standard: EE.2.OA.3									
I can make two groups of two.	Date										
	DATA										
I can separate objects into two groups.	Date										
	DATA										
I can equally distribute even numbers of objects between two groups.	Date										
	DATA										
I can determine that a quantity of objects is even or odd by separating them into two groups.	Date										
	DATA										

Grade HS Math

G.CO.1 Element Card

Domain: Geometry - Congruence

Cluster: Experiment with transformations in the plane.

Standard: G.CO.1: Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment based on the undefined notions of point, line, distance along a line and distance around a circular arc.

Essential Element EE.G-CO.1: Know the attributes of perpendicular lines, parallel lines, and line segments; angles; and circles.

Grade 8 Essential Element EE.8.G.4:

- Identify similar shapes with and without rotation.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can draw perpendicular lines.
- I can draw parallel lines.
- I can draw line segments.
- I can draw angles.
- I can draw circles.

Key Vocabulary:

- perpendicular
- parallel
- line
- angle
- circle
- segment

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

- Draw examples of perpendicular lines, parallel lines, and line segments, angles, and circles.
- Know the attributes of perpendicular lines, parallel lines, and line segments, angles, and circles.
- Know the attributes of lines, circles, and angles with equivalent measure.
- Ex. When shown the trajectory of movement of an object, predict where the object will go.
- Identify a line and a shape (i.e. circle, square, triangle).

Real World Connections:

- Street directions, bus routes, maps
- Clockwise and counter clockwise direction (opening jars, doors, etc.)
- Following directions

Resources:

- <http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/secondarymathematics/Math%20%20Lessons/32-NewMath7LessonFFeb3BasicGeometryIdeasandAngleMeasurement.pdf>
- <https://www.cohs.com/editor/userUploads/file/Meyn/Geo%20Ch%201%20Student%20WB.pdf>

Grade HS Math

Domain: Geometry - Congruence

Cluster: Experiment with transformations in the plane.

G.CO.1 Element Card

Grade HS Math

G.CO.4-5 Element Card

Domain: Geometry - Congruence

Cluster: Experiment with transformations in the plane.

Standard: G.CO.4: Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments

Standard: G.CO.5: Given a geometric figure and a rotation, reflection, or translation, draw the transformed figures using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Essential Element EE.G-CO.4-5: Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.

Grade 8 Essential Element EE.8.G.1:

- Recognize translations, rotations, and reflections of shapes.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can identify a rotation.
- I can identify a reflection.
- I can identify a slide.

Key Vocabulary:

- increase
- decrease
- rotation
- reflection
- slide
- translation

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

Demonstrate what happens when a figure is transformed (increased/decreased).

Identify rotations, reflections, and slides.

Recognize rotation, reflection, or slide (key terms, vocabulary, and movement).

Attend to movement demonstrating rotations, reflections, and slides.

Real World Connections:

- Mirror image
- Graphic design on the computer
- Debit cards/Key cards for doors

Grade HS Math

G.CO.4-5 Element Card

Domain: Geometry - Congruence

Cluster: Experiment with transformations in the plane.

- Opening and closing doors

Resources:

- <http://www.mathopenref.com/congruent.html>
- http://www.edugains.ca/resources/LNS/GuidestoEffectiveInstruction/GEI_Math_K-6_GeomSpatialSense_Gr4-6/Guide_Geometry_Spatial_Sense_456.pdf
- <http://www.ixl.com/math/algebra-1/similar-figures-side-lengths-and-angle-measures>

Grade HS Math

G.CO.6-8 Element Card

Domain: Geometry - Congruence

Cluster: Understand congruence in terms of rigid motions.

Standard: G.CO.6: Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

G.CO.7: Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

G.CO.8: Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Essential Element EE.G-CO.6-8: Identify corresponding congruent and similar parts of shapes.

Grade 8

Essential Element EE.8.G4:

- Identify similar shapes with and without rotation.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can recognize congruent shapes.
- I can recognize congruent parts.
- I can identify two corresponding parts.
- I can demonstrate how shapes are congruent.

Key Vocabulary:

- congruent
- corresponding
- sides
- angles

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

- Recognize shapes that are congruent.
- Recognize congruent parts (angles and sides).
- Identify corresponding congruent (the same) parts of shapes.
- Demonstrate how shapes are congruent. (size, sides, angles)

Real World Connections:

Grade HS Math

G.CO.6-8 Element Card

Domain: Geometry - Congruence

Cluster: Understand congruence in terms of rigid motions.

- Match plastic containers and covers
- Judge the size of box needed to pack/mail
- Sort related to an on the job skill

Resources:

- http://alex.state.al.us/lesson_view.php?id=21195
- <http://www.learningpt.org/pdfs/mscLessonPlans/dotson.pdf>
- <http://www.ixl.com/math/algebra-1>

Grade HS Math

G-GMD.1 Element Card

Domain: Geometry-Geometric Measurement and Dimension

Cluster: Explain volume formulas, and use them to solve problems.

Standard G-GMD.1: Given an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalier's principle, and informal limit arguments.*

Essential Element G-GMD.1-3: Make a prediction about the volume of a container, the area of a figure, and the perimeter of a figure, and then test the prediction using formulas or models.

Grade 8 Essential Element EE.8.G.9:

- Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter of area and rectangles and volume of rectangular prisms).

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- Determine the difference between circumference and volume when given an object.
- Identify cylinder, pyramid, and cone

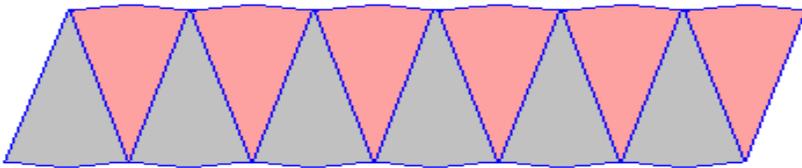
Key Vocabulary:

- Volume
- Cylinder
- Pyramid
- Cone

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

-

Instructional Examples:



Real World Connections:

- Liquid measurement for volume
- Practical measurement of objects in the classroom

Grade HS Math

G-GMD.1 Element Card

Domain: Geometry-Geometric Measurement and Dimension

Cluster: Explain volume formulas, and use them to solve problems.

- **Resources:**
- Formula: $A = \pi r^2$
- Website: Mathsforteachers.com, Calculating Volumes of Compound Objects
- <http://voices.yahoo.com/math-lesson-plan-defining-perimeter-area-volume-10369677.html>
- <http://www.ixl.com/math/algebra-1>
- http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_895241.pdf

Grade HS Math

G-GMD.4 Element Card

Domain: Geometry – Geometric Measurement and Dimension

Cluster: Visualize relationships between two-dimensional and three-dimensional objects.

Standard: G.GMD.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Essential Element EE.G-GMD.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects..

Grade 8 Essential Element EE.8.G.4:

- Identify similar shapes with and without rotation.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can recognize a two dimensional object.
- I can recognize a three dimensional object.
- I can identify two-dimensional shapes.

Key Vocabulary:

- square
- cube
- triangle
- pyramid
- circle
- sphere
- cone
- cylinder

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

- Use the properties of two-dimensional and three-dimensional objects to solve real-world problems.
- Distinguish between two-dimensional and three-dimensional objects to solve real-world problems.
- Distinguish between two-dimensional and three-dimensional
- Identify two-dimensional shapes.

Real World Connections:

- Following directions on a diagram (putting furniture together)
- Blue prints
- Choosing the right shape for the purpose

Resources:

- <https://www.teachingchannel.org/videos/visualizing-geometry-lesson>
- http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_895241.pdf
- <http://staff.rentonschools.us/renton/secondary-math/geometry-ccss-m-resources/download/G.GMD.4+lesson+plan-Identifying+Three-Dimensional+Figures+by+Rotating+Two-Dimensional+Figures.docx?id=74464>
- http://www.mhschool.com/math/mathconnects/tn/se/030308_chapter_10.pdf

Grade HS Math

G-GMD.4 Element Card

Domain: Geometry – Geometric Measurement and Dimension

Cluster: Visualize relationships between two-dimensional and three-dimensional objects.

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Grade HS Math

G-GPE.7 Element Card

Domain: Geometry-Expressing Geometric Properties with Equations

Cluster: Use Coordinates to prove simple geometric theorems algebraically.

Standard G-GPE.7: Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	Essential Element G-GPE.7: Find perimeters and areas of squares and rectangles to solve real-world problems.
Grade 8 Essential Element EE.8.G.9: <ul style="list-style-type: none">Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter of area and rectangles and volume of rectangular prisms).	Post-Secondary Essential Element: <ul style="list-style-type: none">Real Life Application
I Can Statements: <ul style="list-style-type: none">I can compute distance between two pointsI can find the perimeter of a polygonI can compute the area of a triangle and rectangle	
Key Vocabulary: <ul style="list-style-type: none">Distance formulaPerimeterpolygon	Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling) <ul style="list-style-type: none">Graph paper
Instructional Examples: <ul style="list-style-type: none">Computer to highlight spaces on gridsInteractive whiteboard to choose select gridsPeg boards to count spacesDemonstrate coordinates on graph paper	
Real World Connections: <ul style="list-style-type: none">Learning a bus routeDetermining distance between two points of travel	
Resources: distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	

Grade HS Math

G-GPE.7 Element Card

Domain: Geometry-Expressing Geometric Properties with Equations

Cluster: Use Coordinates to prove simple geometric theorems algebraically.

- <http://www.youtube.com/watch?v=pURnQNZb4uc>
- <http://learnzillion.com/lessons/1167-use-a-chart-to-understand-how-rectangles-can-have-the-same-perimeter-with-different-areas>
- <http://www.ixl.com/math/algebra-1/perimeter>
- <http://www.ixl.com/math/algebra-1/area>

Grade HS Math

G-MG.1-3 Element Card

Domain: Geometry-Modeling with Geometry

Cluster: Apply geometric concepts in modeling situations.

Standard G-MG.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

G-MG.2: Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTU's per cubic foot).

G-MG.3: Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Essential Element G-Mg.1-3: Use properties of geometric shapes to describe real-life objects.

Grade 8 Essential Element EE.8.G.9:

- Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter of area and rectangles and volume of rectangular prisms).

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can use geometric shapes and their properties to describe objects.

Key Vocabulary:

- Sides
- Angles
- Regular
- Irregular
- Base
- Vertices

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

- Geoboard
- Virtual websites

Instructional Examples:

- Introduce key vocabulary with pictorials of shapes
- Use of virtual geoboards and tangrams
- Volume War (card game)

Real World Connections:

Grade HS Math

G-MG.1-3 Element Card

Domain: Geometry-Modeling with Geometry

Cluster: Apply geometric concepts in modeling situations.

- Sign recognition (shapes) in the community
- Installation of tile
- Charting, mapping

Resources:

Websites: National Library of Virtual Manipulatives

[http://www.mhschool.com/math/mathconnects/tn/se/030308 chapter 10.pdf](http://www.mhschool.com/math/mathconnects/tn/se/030308%20chapter%2010.pdf)

<http://www.fayar.net/east/teacher.web/math/Illuminations/lessonplans/prek-2/shape/Shape.pdf>

http://www.teach-nology.com/teachers/lesson_plans/math/shapes/

Grade HS Math

G-SRT.2 Element Card

Domain: Geometry-Similarity, Right Triangles, and Trigonometry

Cluster: Understand similarity in terms of similarity transformations.

<p>Standard G-SRT.2: Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.</p>	<p>Essential Element G-SRT.2: N/A See EE.G-CO.6-8 : Identify corresponding congruent and similar parts of shapes.</p>
<p>Grade 8 Essential Element EE.7.G.1:</p> <ul style="list-style-type: none">Match two similar geometric shapes that are proportional in size and in the same orientation.	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">Real Life Application
<p>I Can Statements:</p> <ul style="list-style-type: none">I can determine whether two figures are similar.I can determine similarity based on equality of corresponding angles and the proportionality of corresponding sides.	
<p>Key Vocabulary:</p> <ul style="list-style-type: none">Proportionsimilar	<p>Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)</p>
<p>Instructional Examples:</p> <ul style="list-style-type: none">Enlarging and reducing geometric objects to demonstrate similaritiesEnlarging and reducing font sizes to demonstrate similaritiesFinding and matching similar geometric shapes	
<p>Real World Connections:</p> <ul style="list-style-type: none">Construction of homes	
<p>Resources:</p> <ul style="list-style-type: none">Websites – Hopewell Geometry, Helping With Math, Calculating Volumes of Compound Objects, Map Math	

Grade HS Math

EE. G.CO.2-3 Element Card

Domain: Geometry - Congruence

Cluster: Experiment with transformations in the plane.

<p>Standard G-CO.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).</p> <p>G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygons, describe the rotations and reflections that carry it onto itself.</p>	<p>Essential Element G.CO.2-3 Not applicable</p>
<p>Grade 8 EE.8.G.5. Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle.</p>	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">• Real Life Application
<p>I Can Statements:</p>	
<p>Key Vocabulary:</p>	<p>Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)</p>
<p>Instructional Examples:</p>	
<p>Real World Connections:</p>	
<p>Resources:</p>	

Grade HS Math

EE. G.CO.9-13 Element Card

Domain: Geometry - Congruence

Cluster: Prove geometric theorems.

Make geometric constructions.

<p>Standard</p> <p>G-CO.9. Prove theorems about lines and angles. <i>Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</i></p> <p>G-CO.10. Prove theorems about triangles. <i>Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</i></p> <p>G-CO.11. Prove theorems about parallelograms. <i>Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</i></p> <p>G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). <i>Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</i></p> <p>G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.</p>	<p>Essential Element G.CO.9-13</p> <p>Not applicable</p>
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<p>Grade 8 EE.8.G.5. Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle.</p>	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">• Real Life Application
<p>I Can Statements:</p>	
<p>Key Vocabulary:</p>	<p>Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers,</p>

Grade HS Math

EE. G.CO.9-13 Element Card

Domain: Geometry - Congruence

Cluster: Prove geometric theorems.

Make geometric constructions.

	task analysis, manipulatives, real world materials, modeling)
Instructional Examples:	
Real World Connections:	
Resources:	

Grade HS Math

EE.N-VM.1 - 3 Element Card

Domain: Number and Quantity-Vector and Matrix Quantities

Cluster: Represent and model with vector quantities.

<p>Standard N-VM.1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., \mathbf{v}, \mathbf{v}, \mathbf{v}, v).</p> <p>N-VM.2. (+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p> <p>N-VM.3. (+) Solve problems involving velocity and other quantities that can be represented by vectors.</p>	<p>Essential Element N-VM.1 -3 Not Applicable</p>
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<p>Grade 8 EE.8.F.4. Determine the values or rule of a function using a graph or a table.</p>	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">• Real Life Application
<p>I Can Statements:</p>	
<p>Key Vocabulary:</p>	<p>Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)</p>
<p>Instructional Examples:</p>	
<p>Real World Connections:</p>	
<p>Resources:</p>	

Grade HS Math

EE.N-VM.4 - 12 Element Card

Domain: Number and Quantity-Vector and Matrix Quantities

Cluster: Perform operations on vectors.

Standard

N-VM.4. (+) Add and subtract vectors.

N-VM.4.a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.

N-VM.4.b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.

N-VM.4.c. Understand vector subtraction $\mathbf{v} - \mathbf{w}$ as $\mathbf{v} + (-\mathbf{w})$, where $-\mathbf{w}$ is the additive inverse of \mathbf{w} , with the same magnitude as \mathbf{w} and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.

N-VM.5. (+) Multiply a vector by a scalar.

N-VM.5.a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.

N-VM.5.b. Compute the magnitude of a scalar multiple $c\mathbf{v}$ using $\|c\mathbf{v}\| = |c|\mathbf{v}$. Compute the direction of $c\mathbf{v}$ knowing that when $|c| \neq 0$, the direction of $c\mathbf{v}$ is either along \mathbf{v} (for $c > 0$) or against \mathbf{v} (for $c < 0$).

N-VM.6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.

N-VM.7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.

N-VM.8. (+) Add, subtract, and multiply matrices of appropriate dimensions.

Essential Element N-VM.4 -12 Not Applicable

Grade HS Math

EE.N-VM.4 - 12 Element Card

Domain: Number and Quantity-Vector and Matrix Quantities

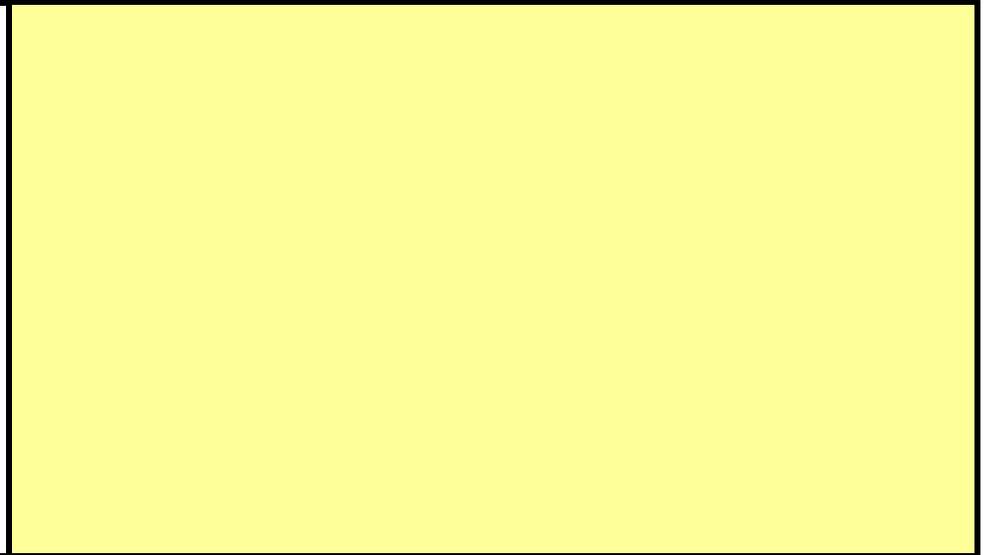
Cluster: Perform operations on vectors.

N-VM.9. (+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.

N-VM.10. (+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.

N-VM.11. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.

N-VM.12. (+) Work with 2×2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.



Grade 8 EE.8.F.4. Determine the values or rule of a function using a graph or a table.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

Key Vocabulary:

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

Real World Connections:

Resources:

Grade HS Math

EE. G-C.1-5 Element Card

Domain: Geometry – Circles

Cluster: Understand and apply theorems about circles.

Find arc lengths and areas of sectors of circles.

<p>Standard</p> <p>G-C.1. Prove that all circles are similar.</p> <p>G-C.2. Identify and describe relationships among inscribed angles, radii, and chords. <i>Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</i></p> <p>G-C.3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p> <p>G-C.4. (+) Construct a tangent line from a point outside a give circle to the circle.</p> <p>G-C.5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.</p>	<p>Essential Element G-C.1-5</p> <p>Not applicable</p>
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<p>Grade 8 EE.8.G.1. Recognize translations, rotations, and reflections of shapes.</p>	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">• Real Life Application
<p>I Can Statements:</p>	
<p>Key Vocabulary:</p>	<p>Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)</p>
<p>Instructional Examples:</p>	
<p>Real World Connections:</p>	
<p>Resources:</p>	

Grade HS Math

EE. G-C.1-5 Element Card

Domain: Geometry – Circles

Cluster: Understand and apply theorems about circles.

Find arc lengths and areas of sectors of circles.

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Grade HS Math

G-GMD.4 Element Card

Domain: Geometry – Geometric Measurement and Dimension

Cluster: Visualize relationships between two-dimensional and three-dimensional objects.

Standard: G.GMD.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Essential Element EE.G-GMD.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects..

Grade 8 Essential Element EE.8.G.4:

- Identify similar shapes with and without rotation.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

- I can recognize a two dimensional object.
- I can recognize a three dimensional object.
- I can identify two-dimensional shapes.

Key Vocabulary:

- square
- cube
- triangle
- pyramid
- circle
- sphere
- cone
- cylinder

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

- Use the properties of two-dimensional and three-dimensional objects to solve real-world problems.
- Distinguish between two-dimensional and three-dimensional objects to solve real-world problems.
- Distinguish between two-dimensional and three-dimensional
- Identify two-dimensional shapes.

Real World Connections:

- Following directions on a diagram (putting furniture together)
- Blue prints
- Choosing the right shape for the purpose

Resources:

- <https://www.teachingchannel.org/videos/visualizing-geometry-lesson>
- http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_895241.pdf
- <http://staff.rentonschools.us/renton/secondary-math/geometry-ccss-m-resources/download/G.GMD.4+lesson+plan-Identifying+Three-Dimensional+Figures+by+Rotating+Two-Dimensional+Figures.docx?id=74464>
- http://www.mhschool.com/math/mathconnects/tn/se/030308_chapter_10.pdf

Grade HS Math

G-GMD.4 Element Card

Domain: Geometry – Geometric Measurement and Dimension

Cluster: Visualize relationships between two-dimensional and three-dimensional objects.

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Grade HS Math

EE. G-GPE.1-6 Element Card

Domain: Geometry – Expressing Geometric Properties with Equations

Cluster: Translate between the geometric description and the equation for a conic section.

Use coordinates to prove simple geometric theorems algebraically.

<p>Standard</p> <p>G-GPE.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</p> <p>G -GPE.2. Derive the equation of a parabola given a focus and directrix.</p> <p>G-GPE.3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.</p> <p>G-GPE.4. Use coordinates to prove simple geometric theorems algebraically. <i>For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</i></p> <p>G-GPE.5. Prove the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p> <p>G-GPE.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.</p> <p>G-GPE.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.</p>	<p>Essential Element G-GPE.1-7</p> <p>Not applicable</p>
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<p>Grade 8 EE.8.G.9. Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter and area of rectangles and volume of rectangular prisms).</p>	<p>Post-Secondary Essential Element:</p> <ul style="list-style-type: none">• Real Life Application
<p>I Can Statements:</p>	
<p>Key Vocabulary:</p>	<p>Supports (specific to student): (e.g., assistive technology, communication)</p>

Grade HS Math

EE. G-GPE.1-6 Element Card

Domain: Geometry – Expressing Geometric Properties with Equations

Cluster: Translate between the geometric description and the equation for a conic section.

Use coordinates to prove simple geometric theorems algebraically.

	system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)
Instructional Examples:	
Real World Connections:	
Resources:	

Grade HS Math

EE. G-SRT.1-11 Element Card

Domain: Geometry – Similarity, Right Triangles, and Trigonometry

Cluster: Understanding similarity in terms of similarity transformations.

Prove theorems involving similarity.

Define trigonometric ratios, and solve problems involving right triangles.

Apply trigonometry to general triangles.

Standard

G-SRT.1. Verify experimentally the properties of dilations given by a center and a scale factor:

G-SRT.1.a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.

G-SRT.1.b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

G-SRT.2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

G-SRT.3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.

G-SRT.4. Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*

G-SRT.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G-SRT.6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

Essential Element G.SRT.1-11

Not applicable See EE.G-CO.6-8

Grade HS Math

EE. G-SRT.1-11 Element Card

Domain: Geometry – Similarity, Right Triangles, and Trigonometry

Cluster: Understanding similarity in terms of similarity transformations.

Prove theorems involving similarity.

Define trigonometric ratios, and solve problems involving right triangles.

Apply trigonometry to general triangles.

G-SRT.7. Explain and use the relationship between the sine and cosine of complementary angles.

G-SRT.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G-SRT.9. (+) Derive the formula $A = \frac{1}{2} ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

G-SRT.10. (+) Prove the Laws of Sines and Cosines, and use them to solve problems.

G-SRT.11. (+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

Grade 8 EE.8.G.5. Compare any angle to a right angle, and describe the angle as greater than, less than, or congruent to a right angle.

Post-Secondary Essential Element:

- Real Life Application

I Can Statements:

Key Vocabulary:

Supports (specific to student): (e.g., assistive technology, communication system, visual aids, templates, active board, highlighters, graphic organizers, task analysis, manipulatives, real world materials, modeling)

Instructional Examples:

Real World Connections:

Resources:

Grade HS Math

EE. G-SRT.1-11 Element Card

Domain: Geometry – Similarity, Right Triangles, and Trigonometry

Cluster: Understanding similarity in terms of similarity transformations.

Prove theorems involving similarity.

Define trigonometric ratios, and solve problems involving right triangles.

Apply trigonometry to general triangles.

HS Math Resources

HS Math: DLM Essential Elements

Number and Quantity—The Real Number System

N-RN.1

EE.N-RN.1 – Determine the value of a quantity that is squared or cubed.

<http://www.discoveryeducation.com/teachers/free-lesson-plans/discovering-math-computations.cfm>

http://www.k12math.com/math-concepts/algebra/radical_equations/radicals.html

<http://www.math.com/school/subject1/lessons/S1U1L9GL.html>

N-RN.2-3 – Not Applicable.

Number and Quantity—Quantities

N-Q.1-3

EE.N.Q.1-3 – Express Quantities to the appropriate precision of measurement.

<http://www.ask.com/question/what-is-a-precise-measurement-and-lesson-plans>

<https://www.teachingchannel.org/videos/measurement-lesson-ideas?fd=1>

<https://www.teachingchannel.org/videos/teaching-volume>

Number and Quantity—The Complex Number System

N-CN.1 – Not Applicable.

N-CN.2

EE.N-CN.2.a – Use the commutative, associative, and distributive properties to add, subtract, and multiply whole numbers.

http://alex.state.al.us/lesson_view.php?id=26396

<http://www.purplemath.com/modules/numbprop.htm>

<http://www.math.com/school/subject1/lessons/S1U1L13DP.html>

https://www.khanacademy.org/math/arithmetric/multiplication-division/distributive_property/v/the-distributive-property

EE.N-CN.2.b – Solve real-world problems involving addition and subtraction of decimals, using models when needed.

<http://learnzillion.com/lessons/1150-use-addition-and-subtraction-to-solve-realworld-problems-involving-decimals>

http://alex.state.al.us/lesson_view.php?id=26251

http://www.gvsd.org/cms/lib02/pa01001045/centricity/domain/446/pa5etex_0305.pdf

EE.N.CN.2.c – Solve real-world problems involving multiplication of decimals and whole numbers, using models when needed.

<http://www.ck12.org/user:YmdyZWVvQG1pdGFjYWRIbXkub3Jn/section/Multiplying-Decimals-and-Whole-Numbers-%253A%253Aof%253A%253A-Multiplication-and-Division-of-Decimals/>
<http://mbpms.chatham.k12.nc.us/modules/groups/homepagefiles/cms/2394745/File/6th%20Grade%20Math/6chap04.pdf>
http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_01_8_95241.pdf
http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/mathematics/grade6/Unit_8_Multiplication_and_Division_of_Decimals_final.pdf

N-CN.3-9 – Not Applicable.

Number and Quantity—Vector and Matrix Quantities.

N-VM.1-12 – Not Applicable.

Algebra—Seeing Structure in Expressions

A-SSE.1

EE.A-SSE.1 – Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.

http://www.bigideasmath.com/protected/content/ipe/grade%206/01/g6_01_01.pdf
http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_te/Chapter_05_8_952441.pdf
https://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/why-of-algebra/e/one_step_equation_intuition
<http://www.ixl.com/math/algebra-1/solve-one-step-linear-equations>
<http://www.ixl.com/math/algebra-1/simplify-variable-expressions-involving-like-terms-and-the-distributive-property>

A.SSE.2 – Not Applicable

EE.A-SSE.3 – Solve simple algebraic equations with one variable using multiplication and division.

<http://www.brighthubeducation.com/high-school-math-lessons/127708-solving-one-step-equations-using-multiplication-or-division/>
<http://mathforum.org/library/drmath/view/57529.html>

EE.A-SSE.4 – Determine the successive term in a geometric sequence given the common ratio.

<http://www.ck12.org/book/CK-12-Algebra-II-with-Trigonometry-Concepts/r3/section/11.8/>
<http://www.paulabliss.com/LifeSkillsInstruction.htm>

Algebra—Arithmetic with Polynomials and Rational Expressions

A-APR.1-7 -- Not Applicable

Algebra—Creating Equations

A-CED.1

EE.A-CED.1 – Create an equation involving one operation with one variable, and use it to solve real-world problem.

<http://www.uen.org/Lessonplan/preview.cgi?LPid=23403>

<http://www.paulabliss.com/LifeSkillsInstruction.htm>

A-CED.2-4

EE.A-CED.2-4 – Solve one-step inequalities.

coe.jmu.edu/cta/CTA%20Mathematics/612Math7.15Inequalities2.docx

<http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/secondary/mathematics/Math%207%20Lessons/25-NewMath7LessonEJan3SolvingInequalities.pdf>

<http://betterlesson.com/lesson/19562/introduction-to-inequalities>

<http://www.ixl.com/math/algebra-1/solve-one-step-linear-inequalities-addition-and-subtraction>

Algebra—Reasoning with Equations and Inequalities

A-REI.1 – Not Applicable

A-REI.2 – Not Applicable. See EE.A-CED.1.

A-REI.3 -- Not Applicable. See EE.A-CED.1.

A-REI.4, a-b – Not Applicable

A-REI.5 – Not Applicable

A-REI.6 – Not Applicable. See EE. A-REI.10-12

A-REI.7 – Not Applicable. See EE. A-REI.10-12

A-REI.8 – Not Applicable.

A-REI.9 – Not Applicable.

A-REI.10-12

EE.A-REI.10-12 – Interpret the meaning of a point on the graph of a line. *For example, on a graph of pizza purchases, trace the graph to a point and tell the number of pizzas purchased and the total cost.*

<http://www.brainpopjr.com/math/data/linegraphs/grownups.weml>

<http://www.teach-nology.com/worksheets/math/graph/parts.html>

<http://www.cimt.plymouth.ac.uk/projects/mepres/book8/y8s14lpd.pdf>

Functions—Interpreting Functions

F-IF.1-3

EE.F-F-IF.1-3 – Use the concept of function to solve problems.

http://www.edugains.ca/resourcesLNS/GuidestoEffectiveInstruction/GEI_Math_K-6_PatterningAlgebra_Gr4-6/Guide_Patterning_and_Algebra_456.pdf

<http://www.ixl.com/math/algebra-1>

F-IF.4-6

EE.F-IF.4-6 – Construct graphs that represent linear functions with different rates of change and interpret which is faster/slower, higher/lower, etc.

http://www.teachervision.fen.com/tv/printables/botr/botr_029_27-27.pdf

<http://www.teach-nology.com/worksheets/math/graph/>

<http://lf4eled.tripod.com/teacher/id19.html>

F-IF.7, a-e – Not Applicable. See EE.F-IF.1-3.

F-IF.8, a-b – Not Applicable.

F-IF.9 – Not Applicable.

Functions—Building Functions

F-BF.1.a-b

EE.F-BF.1. Select the appropriate graphical representation (first quadrant) given a situation involving constant rate of change.

<http://nces.ed.gov/nceskids/createagraph/default.aspx>

<http://mrnussbaum.com/coolgraphing/>

<http://www.ixl.com/math/algebra-1>

F-BF.1.c – Not Applicable.

F-BF.2

EE.F-BF.2 – Determine an arithmetic sequence with whole numbers when provided a recursive rule.

http://fym.la.asu.edu/~tturner/MAT_117_online/SequenceAndSeries/Sequences.htm

<http://www.slidermath.com/probs/Pattern4.shtml>

<http://www.topmarks.co.uk/interactive.aspx?cat=20>

F-BF.3-5 – Not Applicable.

Functions—Linear, Quadratic, and Exponential Models

F-LE.1-3

EE.F-FE.1-3 – Model a simple linear function such as $y = mx$ to show that these functions increase by equal amounts over equal intervals.

<https://www.math.okstate.edu/~noell/ebsm/linear.html>

<https://www.teachingchannel.org/videos/graphing-linear-equations-lesson>

<http://www.ixl.com/math/algebra-1>

F-LE.4 – Not Applicable.

F-FE.5 – Not Applicable. See EE.F-IF.1-3

Functions—Trigonometric Functions

F-TF.1-9 – Not Applicable.

Geometry—Congruence

G-CO.1

EE.G-CO.1 – Know the attributes of perpendicular lines, parallel lines, and line segments; angles; and circles.

<http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/secondary/mathematics/Math%207%20Lessons/32->

[NewMath7LessonFFeb3BasicGeometryIdeasandAngleMeasurement.pdf](http://www.graniteschools.org/depart/teachinglearning/curriculuminstruction/math/secondary/mathematics/Math%207%20Lessons/32-NewMath7LessonFFeb3BasicGeometryIdeasandAngleMeasurement.pdf)

<https://www.cohs.com/editor/userUploads/file/Meyn/Geo%20Ch%201%20Student%20WB.pdf>

G-CO.2 – Not Applicable.

G-CO.3 – Not Applicable.

G-CO.4-5

EE.G.CO.4-5 – Given a geometric figure and a rotation, reflection, or translation of that figure, identify the components of the two figures that are congruent.

<http://www.mathopenref.com/congruent.html>

http://www.edugains.ca/resourcesLNS/GuidestoEffectiveInstruction/GEI_Math_K-6_GeomSpatialSense_Gr4-6/Guide_Geometry_Spatial_Sense_456.pdf

<http://www.ixl.com/math/algebra-1/similar-figures-side-lengths-and-angle-measures>

G-CO.6-8

EE.G-CO.6-8 – Identify corresponding congruent and similar parts of shapes.

http://alex.state.al.us/lesson_view.php?id=21195

<http://www.learningpt.org/pdfs/mscLessonPlans/dotson.pdf>

<http://www.ixl.com/math/algebra-1>

G-CO.9-13 – Not Applicable.

Geometry—Similarity, Right Triangles, and Trigonometry

G-SRT.1-3 – Not Applicable. See EE.G-CO.6-8.

G-SRT.4 – Not Applicable.

G.SRT.5 – Not Applicable. See EE.G-CO.6-8

G.SRT.6-11 – Not Applicable.

Geometry—Circles

G-C.1-5 – Not Applicable.

Geometry—Expressing Geometric Properties with Equations

G-GPE.1-4 – Not Applicable.

G-GPE.5-6 – Not Applicable. See EE.G-CO.1

G-GPE.7

EE.G.GPE.7 – Find perimeters and areas of squares and rectangles to solve real-world problems.

<http://www.youtube.com/watch?v=pURnQNzb4uc>

<http://learnzillion.com/lessons/1167-use-a-chart-to-understand-how-rectangles-can-have-the-same-perimeter-with-different-areas>

<http://www.ixl.com/math/algebra-1/perimeter>

<http://www.ixl.com/math/algebra-1/area>

Geometry—Geometric Measurement and Dimension

G-GMD.1

EE.G-GMD.1-3 – Make a prediction about the volume of a container, the area of a figure, and the perimeter of a figure, and then test the prediction using formulas or models.

<http://voices.yahoo.com/math-lesson-plan-defining-perimeter-area-volume-10369677.html>

<http://www.ixl.com/math/algebra-1>

http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_8_95241.pdf

G-GMD.2 – Not Applicable.

G-GMD.3 – Not Applicable. See EE.8.G.9 and EE.G-GPE.7.

G-GMD.4

EE.G-GMD.4 – Identify the shapes of two-dimensional cross-sections of three-dimensional objects.

<https://www.teachingchannel.org/videos/visualizing-geometry-lesson>

http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_8_95241.pdf

<http://staff.rentonschools.us/renton/secondary-math/geometry-ccss-m-resources/download/G.GMD.4+lesson+plan-Identifying+Three-Dimensional+Figures+by+Rotating+Two-Dimensional+Figures.docx?id=74464>

http://www.mhschool.com/math/mathconnects/tn/se/030308_chapter_10.pdf

Geometry—Modeling with Geometry

G-MG.1-3

EE.G.MG.1-3 – Use properties of geometric shapes to describe real-life objects.

http://www.mhschool.com/math/mathconnects/tn/se/030308_chapter_10.pdf

<http://www.fayar.net/east/teacher.web/math/Illuminations/lessonplans/prek-2/shape/Shape.pdf>

http://www.teach-nology.com/teachers/lesson_plans/math/shapes/

Statistics and Probability—Interpreting Categorical and Quantitative Data

S-ID.1-2

EE.S-ID.1-2 – Given data, construct a simple graph (line, pie, bar, or picture) or table, and interpret the data.

<http://nces.ed.gov/nceskids/createagraph/>

<http://www.ixl.com/math/algebra-1>

<http://www.800score.com/gre-guided7view1h.html>

http://www.internet4classrooms.com/grade_level_help/embedded_inquiry_data_table_sixth_6th_grade_science.htm

S-ID.3

EE.S-ID.3 – Interpret general trends on a graph or chart.

<http://math.about.com/od/worksheets/ss/graphcharts.htm>

<http://www.teachervision.fen.com/graphs-and-charts/lesson-plan/34514.html>

http://www.internet4classrooms.com/grade_level_help/embedded_inquiry_data_table_sixth_6th_grade_science.htm

S-ID.4

EE.S-ID.4 – Calculate the mean of a given data set (limit the number of data points to fewer than five)

<http://betterlesson.com/lesson/6723/calculate-mean>

<http://curry.virginia.edu/curryedaway/?lesson-plan=calculating-mean-median-mode>

https://www.juab.k12.ut.us/index.php?option=com_content&view=article&id=1229:5th-grade-algebra-lesson-plan-mean-median-mode-and-range&catid=66:grammar&Itemid=58

S-ID.5 – Not Applicable. See EE.F-IF.1 and EE.A-REI.6-7

S-ID.6, a-c – Not Applicable.

S-ID.7 – Not Applicable. See EE. F-IF.4-6

S-ID.8-9 – Not Applicable.

Statistics and Probability—Making Inferences and Justifying Conclusions

S-IC.1-2

EE.S-IC.1-2 – Determine the likelihood of an event occurring when the outcomes are equally likely to occur.

http://www.mathgoodies.com/lessons/vol6/intro_probability.html

<http://www.ixl.com/math/algebra-1/experimental-probability>

<http://stattrek.com/probability/what-is-probability.aspx>

S-IC.3 – Not Applicable. See EE.S-ID.1-2.

S-IC.4 – Not Applicable. See EE.S-ID.1-2.

S-IC.5 – Not Applicable. See EE.S-ID.1-2.

S-IC.6 – Not Applicable. See EE.S-ID.1-2.

Statistics and Probability—Conditional Probability and the Rules of Probability.
S-CP.1-5

EE.S-CP.1-5 – Identify when events are independent or dependent.

<https://www.teachingchannel.org/videos/teaching-dependent-and-independent-events>

<http://www.classzone.com/eservices/home/pdf/student/LA212EAD.pdf>

<http://mste.illinois.edu/courses/educ362sp04/folders/fischer/lesplan1.htm>

S-CP.6-7 – Not Applicable. See EE.S-IC.1-2.

S-CP.8-9 – Not Applicable.

Statistics and Probability—Using Probability to Make Decisions

S-MD.1-7 – Not Applicable.

General

<http://nichcy.org/research/ee/math#ld>

http://www.doe.k12.de.us/infosuites/students_family/specialed/NEW/files/March2011.DE.Incl.Conf.pdf

<http://www.hoagiesgifted.org/eric/faq/lesnplan.html>

https://www.osep-meeting.org/2006conf/Presentations/.../BO_D1.PPT

<http://www.paulabliss.com/LifeSkillsInstruction.htm>

<http://www.eds-resources.com/edexc.htm>

<http://new-to-teaching.blogspot.com/2013/04/math-for-students-with-mild-moderate.html>

<http://www.ixl.com/math/algebra-1>

http://www.edugains.ca/resources/LNS/GuidestoEffectiveInstruction/GEI_Math_K-6_PaterningAlgebra_Gr4-6/Guide_Paterning_and_Algebra_456.pdf

<http://www.cpt.fsu.edu/ese/pdf/dsinlssn.pdf>

http://wvde.state.wv.us/teach21/essd/math9-12_instructionalguide.pdf

http://schools.nyc.gov/NR/rdonlyres/835F949D-A3D9-419E-A54C-A004209AAC80/0/NYCDOEG8MathExpressionsandEquations_Final.pdf

<http://www.ck12.org/book/CK-12-Middle-School-Math---Grade-6/r5/>

http://www.glencoe.com/sites/common_assets/mathematics/TN_2012/MC1_se/Chapter_09_8_95241.pdf

https://www.teachingchannel.org/videos?categories=subjects_math&gclid=CKLBmdv03rgCFQ1gMgodSyYA-w