

Curriculum Map: Geometry 20-21

Course: GEOMETRY Sub-topic: Geometry

Grade(s): 9 to 12

Course Description: This course contains the fundamentals of plane geometry utilizing the Euclidean axiomatic approach. A thorough discussion of congruent and similar triangles and a brief introduction to trigonometry are contained. Topics include, area, special right triangles, similarity and proportion, quadrilaterals, triangles and relationships as well as volume and surface area

Course Textbooks, Workbooks, Materials Citations: Geometry
Prentice Hall Mathematics
copyright 2004

Unit: tools of geometry

Timeline: Week 1 to 2

Unit Description: introduction to an axiomatic structure and organization

Unit Essential Questions: How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems? How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving? How can geometric properties and theorems be used to describe, model, and analyze situations? C

Unit Big Ideas: types of reasoning
the big 4 postulates
points, lines and planes
measuring angles and segments
review of perimeter and area

Unit Key Terminology & Definitions : angles
bisector
collinear
coplanar
congruent
conjecture
inductive / deductive reasoning
parallel
perpendicular
plane, line, point
postulate
ray
segment
skew

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

(* standards consolidated from Topic level)

Topic: points lines and planes

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.

Topic: perimeter circumference and area

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.

Topic: postulate meanings

Minutes for Topic: 44

Unit: reasoning and logic

Timeline: Week 3 to 4

Unit

Description: intro to logic and reasoning

Unit Essential

Questions: how do i reach a valid conclusion logically?

Unit Big Ideas: using conditional logic statements to develop two basic laws of logic for reasoning

Unit Materials: textbook

teacher notes

Unit Key

conditional

Terminology &

Definitions : biconditional

complementary supplementary

conclusion

counter example

hypothesis

Law Of Detachment

Law of Syllogism

reflexive / symmetric / transitive

vertical angles

Topic: conditional statements

Minutes for Topic: 44

Topic: biconditional statements

Minutes for Topic: 44

Topic: laws of logic

Minutes for Topic: 88

Unit: parallel lines

Timeline: Week 5 to 6

Unit

Description: using reasoning to find various angles in various figures

Unit Essential Questions: how do i find angle measures when //lines are intersected by transversals?

how do i find angle measures in triangles and polygons?

Unit Big Ideas: finding angles when parallel lines are intersected by a transversal

finding angles in a triangle and polygon

Unit Key Terminology & Definitions : parallel perpendicular

alternate interior, same side interior, vertical, corresponding angles

isosceles, equilateral, scalene

acute, obtuse , right

polygons

concave, convex

transversal

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.B.2.1 \(Advanced\)](#) Determine the measurement of a missing side(s) or angle(s) in a polygon.

[M8.B.2.1.1 \(Advanced\)](#) Determine the total number of degrees in the interior angles of a polygon in 3 - 8 sided figures (formula provided on the reference sheet).

[M8.B.2.1.2 \(Advanced\)](#) Determine the measurement of one interior angle of a regular polygon (3-8 sided polygons, formula provided on the reference sheet).

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

[M11.B.2.1 \(Advanced\)](#) Use and/or compare measurements of angles.

[M8.C.1.1 \(Advanced\)](#) Identify, use, and/or describe properties of angles, triangles, quadrilaterals, circles, pyramids, cubes, prisms, spheres, cones and/or cylinders.

[M8.C.1.1.2 \(Advanced\)](#) Define, identify and/or use properties of angles formed by intersecting lines (complementary, supplementary, adjacent and/or vertical angles).

[M8.C.1.1.3 \(Advanced\)](#) Define, identify and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical corresponding).

(* standards consolidated from Topic level)

Topic: parallel lines cut by a transversal

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.C.1.1.3 \(Advanced\)](#) Define, identify and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical corresponding).

Topic: proving lines parallel

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.C.1.1.3 \(Advanced\)](#) Define, identify and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical corresponding).

Topic: triangle sum theorem

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.2.1 \(Advanced\)](#) Use and/or compare measurements of angles.

[M8.C.1.1.2 \(Advanced\)](#) Define, identify and/or use properties of angles formed by intersecting lines (complementary, supplementary, adjacent and/or vertical angles).

Topic: polygon types

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

[M8.C.1.1 \(Advanced\)](#) Identify, use, and/or describe properties of angles, triangles, quadrilaterals, circles, pyramids, cubes, prisms, spheres, cones and/or cylinders.

Topic: polygon sum theorem

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M8.B.2.1 \(Advanced\)](#) Determine the measurement of a missing side(s) or angle(s) in a polygon.

[M8.B.2.1.1 \(Advanced\)](#) Determine the total number of degrees in the interior angles of a polygon in 3 - 8 sided figures (formula provided on the reference sheet).

[M8.B.2.1.2 \(Advanced\)](#) Determine the measurement of one interior angle of a regular polygon (3-8 sided polygons, formula provided on the reference sheet).

[M11.B.2.1 \(Advanced\)](#) Use and/or compare measurements of angles.

[M8.C.1.1 \(Advanced\)](#) Identify, use, and/or describe properties of angles, triangles, quadrilaterals, circles, pyramids, cubes, prisms, spheres, cones and/or cylinders.

Unit: congruent triangles

Timeline: Week 7 to 10

Unit Description: using congruent triangles to discover other geometric relationships

Unit Essential Questions: How can recognizing repetition or regularity assist in solving problems more efficiently? How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?

Unit Big Ideas: Patterns exhibit relationships that can be extended, described, and generalized. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization.

Unit Materials: textbook and teacher materials

Unit Key isosceles triangle, base, base angles

Terminology &

Definitions : congruent figures

CPCTC

hypotenuse

legs

vertex angle

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2 \(Advanced\)](#) Recognize and/or apply properties of angles, triangles and quadrilaterals.

[M11.C.1.2.3 \(Advanced\)](#) Identify and/or use properties of isosceles and equilateral triangles

[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.

[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

(* standards consolidated from Topic level)

Topic: congruent figures

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

Topic: SSS and SAS triangle congruence

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.

[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

Topic: ASA and AAS triangle congruence

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.

[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

Topic: using parts of congruent figures

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

Topic: isosceles and equilateral triangles

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2 \(Advanced\)](#)

Recognize and/or apply properties of angles, triangles and quadrilaterals.

[M11.C.1.2.3 \(Advanced\)](#)

Identify and/or use properties of isosceles and equilateral triangles

Topic: HL congruence in right triangles

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.3.1 \(Advanced\)](#)

Identify and/or use properties of congruent and similar polygons or solids.

Unit: relationships in triangles

Timeline: Week 11

Unit

Description: geometric relationships within triangles

Unit Essential

How can recognizing repetition or regularity assist in solving problems more efficiently? How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?

Questions:

Unit Big Ideas:

applying indirect reasoning
working with relationships inside a triangle

Unit Materials: text and teacher materials

Unit Key

altitude

Terminology &

Definitions :

centroid

circumcenter

contrapositive

inverse

incenter

indirect reasoning

inscribed

circumscribed

median

negation

orthocenter

concurrency

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.1 \(Advanced\)](#)

Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem).

(* standards consolidated from Topic level)

Topic: triangle midsegments

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.1 \(Advanced\)](#) Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem).

Topic: triangle bisectors, medians, altitudes

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.1 \(Advanced\)](#) Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem).

Topic: triangle inequality

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.1 \(Advanced\)](#) Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem).

Topic: inverses, contrapositives and indirect reasoning

Minutes for Topic: 88

Unit: quadrilaterals

Timeline: Week 16 to 18

Unit

Description: properties of special quadrilaterals

Unit Essential

Questions: how do i use properties of quadrilaterals to solve problems?

Unit Big Ideas: properties of special quadrilaterals

Unit Materials: text and teacher materials

Unit Key

Terminology & Definitions : trapezoids, parallelograms, kites, rectangle, rhombus , square, isosceles trap,

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

(* standards consolidated from Topic level)

Topic: classifying quadrilaterals

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

Topic: parallelograms and properties

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

Topic: special parallelograms

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

Topic: kites and trapezoids

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

Topic: quadrilaterals and coordinate geometry

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.2.2 \(Advanced\)](#) Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).

Unit: right triangles

Timeline: Week 18 to 20

Unit

Description: analyzing right triangles

Unit Essential

Questions: how do i find all the sides of a right triangle?

Unit Big Ideas: using Pythagorean Theorem and shortcuts to solve right triangles

Unit Materials: text and teacher materials

Unit Key Terminology & hypotenuse, leg, right triangle

Definitions : 30-60-90

45-45-90

Pythagorean Theorem and converse

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.A.1.1.3 \(Advanced\)](#) Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$)

[M11.C.1.2.3 \(Advanced\)](#) Identify and/or use properties of isosceles and equilateral triangles

[M11.C.1.4 \(Advanced\)](#) Solve problems involving right triangles using the Pythagorean Theorem.

[M11.C.1.4.1 \(Advanced\)](#) Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).

(* standards consolidated from Topic level)

Topic: pythagorean theorem

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.4 \(Advanced\)](#)

Solve problems involving right triangles using the Pythagorean Theorem.

[M11.C.1.4.1 \(Advanced\)](#)

Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).

Topic: converse of pythagorean theorem

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.4 \(Advanced\)](#)

Solve problems involving right triangles using the Pythagorean Theorem.

[M11.C.1.4.1 \(Advanced\)](#)

Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).

Topic: 30-60-90 triangles

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.A.1.1.3 \(Advanced\)](#)Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$)[M11.C.1.4.1 \(Advanced\)](#)

Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).

Topic: 45-45-90 triangles

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.A.1.1.3 \(Advanced\)](#)Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$)[M11.C.1.2.3 \(Advanced\)](#)

Identify and/or use properties of isosceles and equilateral triangles

[M11.C.1.4.1 \(Advanced\)](#)

Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).

Unit: area

Timeline: Week 21 to 24

Unit**Description:** finding area of geometric shapes**Unit Essential****Questions:** how do i find the area of a geometric shape?**Unit Big Ideas:** finding area using formulas

finding area using a combination of formulas

Unit Materials: text and teacher materials**Unit Key**

area

Terminology &**Definitions :** perimeter, circumference

radius, diameter, chord, arc, central angle

concentric circles

apothem

sector and segment of circle

semicircle

STANDARDS: STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

[M11.B.2.3 \(Advanced\)](#) Describe how a change in one dimension of a figure (2 or 3 dimensional) affects other measurements of that figure.

[M11.B.2.3.1 \(Advanced\)](#) Describe how a change in the linear dimension of a figure affects its perimeter, circumference, area or volume.

- How does changing the length of the radius of a circle affect the circumference of the circle?
- How does changing the length of the edge of a cube affect the volume of the cube?
- How does changing the length of the base of a triangle affect the area of the triangle?

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

(* standards consolidated from Topic level)

Topic: parallelogram / triangle area

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

Topic: Herons formula for triangle area

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

Topic: area of trapezoids, rhombuses and kites

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

[M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.

Topic: regular polygon area

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.
- [M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.
- [M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

Topic: circle and sector area

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)
- [M11.B.2.3 \(Advanced\)](#) Describe how a change in one dimension of a figure (2 or 3 dimensional) affects other measurements of that figure.
- [M11.B.2.3.1 \(Advanced\)](#) Describe how a change in the linear dimension of a figure affects its perimeter, circumference, area or volume.
- How does changing the length of the radius of a circle affect the circumference of the circle?
 - How does changing the length of the edge of a cube affect the volume of the cube?
 - How does changing the length of the base of a triangle affect the area of the triangle?
- [M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

Topic: circumference and arc length of circle

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.
- [M11.B.2 \(Advanced\)](#) Apply appropriate techniques, tools and formulas to determine measurements.
- [M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

Topic: geometric probability

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

- [M11.B.1 \(Advanced\)](#) Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

Unit: similarity

Timeline: Week 25 to 26

Unit**Description:** finding and using triangle similarity**Unit Essential Questions:**

how do i use similarity to solve problems?

Unit Big Ideas: using similarity to solve problems**Unit Materials:** text and teacher materials**Unit Key** ratio and proportion

Terminology &**Definitions :** geometric mean

golden ratio / rectangle

scale

similar

similarity ratio

STANDARDS: STANDARDSSTATE: Pennsylvania State Anchors (2010)[M11.A.2.1 \(Advanced\)](#) Apply ratio and/or proportion in problem-solving situations.[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

(* standards consolidated from Topic level)

Topic: ratios and proportions

Minutes for Topic: 44

STANDARDSSTATE: Pennsylvania State Anchors (2010)[M11.A.2.1 \(Advanced\)](#) Apply ratio and/or proportion in problem-solving situations.**Topic: similar figures**

Minutes for Topic: 44

STANDARDSSTATE: Pennsylvania State Anchors (2010)[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.**Topic: proving triangles similar**

Minutes for Topic: 44

STANDARDSSTATE: Pennsylvania State Anchors (2010)[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.**Topic: geometric mean in right triangles**

Minutes for Topic: 88

STANDARDSSTATE: Pennsylvania State Anchors (2010)[M11.C.1.3 \(Advanced\)](#) Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.[M11.C.1.3.1 \(Advanced\)](#) Identify and/or use properties of congruent and similar polygons or solids.

Topic: proportion in triangles

Minutes for Topic: 44

STANDARDSSTATE: [Pennsylvania State Anchors \(2010\)](#)[M11.C.1.3 \(Advanced\)](#)

Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.

[M11.C.1.3.1 \(Advanced\)](#)

Identify and/or use properties of congruent and similar polygons or solids.

Topic: perimeter and area of similar figures

Minutes for Topic: 44

STANDARDSSTATE: [Pennsylvania State Anchors \(2010\)](#)[M11.B.2.2 \(Advanced\)](#)

Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

[M11.C.1.3 \(Advanced\)](#)

Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures.

[M11.C.1.3.1 \(Advanced\)](#)

Identify and/or use properties of congruent and similar polygons or solids.

Unit: trigonometry intro

Timeline: Week 27 to 28

Unit**Description:**

intro to trigonometry

Unit Essential Questions:

how do i find the sides / angles of a right triangle using trigonometry?

Unit Big Ideas:

using basic trigonometry

Unit Materials: text

calculator

teacher materials

Unit Key

sine, cosine tangent ratios

Terminology &**Definitions :**

angles of depression and elevation

trigonometry

STANDARDS: STANDARDSSTATE: [Pennsylvania State Anchors \(2010\)](#)[M11.C.1.4 \(Advanced\)](#)

Solve problems involving right triangles using the Pythagorean Theorem.

(* standards consolidated from Topic level)

Topic: intro to trig ratios

Minutes for Topic: 44

STANDARDSSTATE: [Pennsylvania State Anchors \(2010\)](#)[M11.C.1.4 \(Advanced\)](#)

Solve problems involving right triangles using the Pythagorean Theorem.

Topic: finding sides with trig ratios

Minutes for Topic: 44

Topic: finding angles with trig ratios

Minutes for Topic: 44

Topic: angles of elevation and depression applications

Minutes for Topic: 44

Unit: circles

Timeline: Week 30 to 32

Unit**Description:** properties of circles, including their angles and lines

Unit Essential Questions: How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems? How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?

Unit Big Ideas: properties of circle and their angles and lines**Unit Materials:** text

calculator

teacher materials

Unit Key circle**Terminology &****Definitions :** chord

radius / diameter

inscribed angles

intercepted arc

tangent line / point of tangency

secant line

locus of points

STANDARDS: STANDARDSSTATE: Pennsylvania State Anchors (2010)

[M11.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

[M11.C.3 \(Advanced\)](#) Locate points or describe relationships using the coordinate plane.

[M11.C.3.1 \(Advanced\)](#) Solve problems using analytic geometry.

[M11.C.3.1.1 \(Advanced\)](#) Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane (formula provided on the reference sheet).

(* standards consolidated from Topic level)

Topic: tangent lines

Minutes for Topic: 44

STANDARDSSTATE: Pennsylvania State Anchors (2010)

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

Topic: chords and arcs

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

Topic: inscribed angles

Minutes for Topic: 88

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

Topic: secant and chord lengths

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

Topic: secant and chord angles

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.1 \(Advanced\)](#) Identify and/or use parts of circles and segments associated with circles.

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

Topic: circles in coordinate plane

Minutes for Topic: 44

STANDARDS

STATE: Pennsylvania State Anchors (2010)

[M11.C.1.1.1 \(Advanced\)](#) Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.)

[M11.C.1.1.2 \(Advanced\)](#) Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.

[M11.C.3 \(Advanced\)](#) Locate points or describe relationships using the coordinate plane.

[M11.C.3.1 \(Advanced\)](#) Solve problems using analytic geometry.

[M11.C.3.1.1 \(Advanced\)](#) Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane (formula provided on the reference sheet).

Topic: locus of points

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.C.1 \(Advanced\)](#)

Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.

Unit: surface area and volume

Timeline: Week 35

Unit

Description: volume and surface area of 3D shapes

Unit Essential Questions:

how do I calculate the volume and surface area of 3D shapes?

Unit Big Ideas: volume and surface area of 3D shapes

Unit Materials: text

calculator

teacher materials

3D models

Unit Key

volume / surface area

Terminology &

Definitions :

prisms / solids

altitude

base

cone

cylinder

isometric drawing /perspective drawing

pyramid

sphere

net

cube

polyhedra / polyhedron

tetrahedron, hexahedron, octahedron, dodecahedron, icosahedron

Platonic solid

STANDARDS: STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.B.2.2 \(Advanced\)](#)

Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

[M11.B.2.2.1 \(Advanced\)](#)

Calculate the surface area of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.

[M11.B.2.2.2 \(Advanced\)](#)

Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.

[M8.C.1 \(Advanced\)](#)

Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate

[M8.C.1.1.1 \(Advanced\)](#) understanding of geometric relationships.
Match the three-dimensional figure with its net (cube, cylinder, cone, prism, pyramid). Any measurements used should be consistent in the stem and answer choices.

(* standards consolidated from Topic level)

Topic: figures in space and nets

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M8.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.

[M8.C.1.1.1 \(Advanced\)](#) Match the three-dimensional figure with its net (cube, cylinder, cone, prism, pyramid). Any measurements used should be consistent in the stem and answer choices.

Topic: 3D figures and perspective drawings

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M8.C.1 \(Advanced\)](#) Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.

[M8.C.1.1.1 \(Advanced\)](#) Match the three-dimensional figure with its net (cube, cylinder, cone, prism, pyramid). Any measurements used should be consistent in the stem and answer choices.

Topic: surface area of pyramids and cones

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.)

[M11.B.2.2.1 \(Advanced\)](#) Calculate the surface area of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.

Topic: volume of prisms and cylinders

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.B.2.2.2 \(Advanced\)](#) Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.

Topic: volumes of pyramids and cones

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.B.2.2.2 \(Advanced\)](#) Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.

Topic: surface area and volume of spheres

Minutes for Topic: 44

STANDARDS

STATE: [Pennsylvania State Anchors \(2010\)](#)

[M11.B.2.2 \(Advanced\)](#) Use and/or develop procedures to determine or describe measures of perimeter,

circumference, area, surface area and/or volume. (May require conversions within the same system.)

[M11.B.2.2.2 \(Advanced\)](#)

Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.