**Geometry in Construction UNIT 5 Lesson Plans**

**Day 91**

1) Lesson: Parallel Lines & a Transversal

*Objective:* The students will define alternate interior and exterior angles, same-side interior angles, and corresponding angles. The student will explore the relationships of angles formed by parallel lines and a transversal.

2) Activity: The students will use apps and geometry software to discover the relationships of alternate interior and exterior angles, same-side interior angles, and corresponding angles.

3) Activity: Parallel Lines & Transversals Twister

4) Classwork: Algebra & Angles Practice W.S.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

**Day 92**

1) Classwork: Electrical - Pull Wire

2) Classwork: Electrical - Make Up Boxes

**Day 93**

1) Lesson: Parallel Lines & a Transversal Proofs

 *Objective:* Students will prove angle relationships and if two lines are parallel using their converse

2) Activity: Students will determine if wall studs are parallel or not using angle relationships; students will write a proof and will roof designs to check for parallel lines.

3) Classwork: Proof Writing W.S.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

**Day 94**

1) Classwork: Insulation - Floor

2) Classwork: Insulation - Wall

3) Classwork: Insulation - Vapor Barrier

4) Classwork: Insulation - Ceiling

**Day 95**

1) Lesson: Types of Quadrilaterals

*Objective:* Students will define special types of quadrilaterals through exploration of parallelogram, rhombus, square, rectangle, and trapezoid

2) Activity: Students will use a geometry “app” or software to compare and contrast types of quadrilateral

3) Lesson: Properties of Parallelograms

*Objective:* The students will investigate the specific properties of parallelogram, rhombus, square, rectangle, and trapezoid; namely opposite & adjacent sides, opposite & adjacent angles, and their diagonals.

4) Classwork: Properties of Parallelograms W.S.

[CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/)
Prove theorems about parallelograms. *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*.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

**Day 96**

1) Classwork: Insulation - Floor

2) Classwork: Insulation - Wall

3) Classwork: Insulation - Vapor Barrier

4) Classwork: Insulation - Ceiling

**Day 97**

1) Lesson: Proving a Quadrilateral is a Parallelogram

*Objective:* The students will determine the type of parallelogram based on specific properties

2) Activities:

The students will play various games that work towards a goal of defining a parallelogram as a specific type of parallelogram

* Name game with matching cards
* Online based games
* Creating posters

3) Lesson: Proving a Quadrilateral is a Parallelogram

*Objective:* The students will prove that a quadrilateral is a parallelogram, square, rhombus, or a rectangle using properties of parallelograms and coordinate geometry

4) Classwork: Quadrilateral Proofs Activity

[CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/)
Prove theorems about parallelograms. *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*.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

**Day 98**

1) Classwork: Insulation - Floor

2) Classwork: Insulation - Wall

3) Classwork: Insulation - Vapor Barrier

4) Classwork: Insulation - Ceiling

5) Classwork: Caulking and Sealing all Electrical Boxes and Floor Penetrations

**Day 99**

1) Activity: Students will use properties of quadrilaterals to create the foundation of different building sites using strings and tape measures.

2) Activity: Students will use properties of quadrilaterals to determine if various shapes were properly built

3) Classwork: Parallelograms Properties Organizer

4)Lesson: Distance Formula & Midpoint Formula

*Objective:* The students will use coordinates to prove that two segments are congruent and find the midpoint of a segment.

*5)*Activity:The students will use a scale drawing to calculate distances of boards and midpoints; students will scale to actual sizes.

[CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/)
Prove theorems about parallelograms. *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*.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

**Day 100**

1) Classwork: Insulation - Floor

2) Classwork: Insulation - Wall

3) Classwork: Insulation - Vapor Barrier

4) Classwork: Insulation - Ceiling

5) Classwork: Caulking and Sealing all Electrical Boxes and Floor Penetrations

6) Classwork: Hang Drywall on Ceilings

**Day 101**

1) Lesson: Proving a Quadrilateral is a Parallelogram

*Objective:* The students will prove that a quadrilateral is a parallelogram, square, rhombus, or a rectangle using properties of parallelograms and coordinate geometry

2) Activity: The students will use their Ipads for pictures of shapes and will use properties of quadrilaterals to prove what type of quadrilateral their picture shows.

3) Classwork: Complete Coordinate Proof on Parallelograms

[CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/)
Prove theorems about parallelograms. *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*.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

[CCSS.MATH.CONTENT.HSG.GPE.B.4](http://www.corestandards.org/Math/Content/HSG/GPE/B/4/)
Use coordinates to prove simple geometric theorems algebraically. *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, √3) lies on the circle centered at the origin and containing the point (0, 2).*

**Day 102**

1) Classwork: Insulation - Floor

2) Classwork: Insulation - Wall

3) Classwork: Insulation - Vapor Barrier

4) Classwork: Insulation - Ceiling

5) Classwork: Caulking and Sealing all Electrical Boxes and Floor Penetrations

6) Classwork: Hang Drywall on Ceilings

**Day 103**

1) Activity: Student Feedback & Assessment on Coordinate Proofs; the students will review and provide feedback about each other’s proof

2) Activity: Coordinate Proof #2; students will perform another coordinate proof of a special parallelogram and will write a summary of what shape represents

3) Classwork: Quadrilaterals Review Packet

[CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/)
Prove theorems about parallelograms. *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*.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

[CCSS.MATH.CONTENT.HSG.GPE.B.4](http://www.corestandards.org/Math/Content/HSG/GPE/B/4/)
Use coordinates to prove simple geometric theorems algebraically. *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, √3) lies on the circle centered at the origin and containing the point (0, 2).*

**Day 104**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

**Day 105**

1) Assessment: Quadrilaterals Formative Quiz

2)Lesson: Interior and Exterior Angles of a Polygon

*Objective:* The students will discover the properties of interior and exterior angles of polygons

*Activity:*

Students will be given different shapes and a protractor. They will explore the interior and exterior angles to come up with rules.

3)Classwork: Interior & Exterior Angles W.S.

[CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/)
Prove theorems about lines and angles. *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*.

[CCSS.MATH.CONTENT.HSG.CO.A.1](http://www.corestandards.org/Math/Content/HSG/CO/A/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.

**Day 106**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

**Day 107**

1)Lesson: Midpoints and Midsegments of Triangles & Trapezoids

*Objective:* The students will apply the midsegments of triangles and trapezoids in problem solving situations

2) Activity: The students will explore the angles and midsegments of a trapezoidal bay window

3) Classwork: Midsegments W.S.

4) Lesson: Geometric Constructions

*Objective:* The students will perform the construction of an angle and segment bisector as well as copying an angle and segment

5) Activity: The students will complete packet on geometric constructions and will create a design using basic constructions

6) Complete Constructions Design

[CCSS.MATH.CONTENT.HSG.SRT.B.4](http://www.corestandards.org/Math/Content/HSG/SRT/B/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.*

[*CCSS.MATH.CONTENT.HSG.CO.C.10*](http://www.corestandards.org/Math/Content/HSG/CO/C/10/)

*Prove theorems about triangles. 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.*

[CCSS.MATH.CONTENT.HSG.CO.D.12](http://www.corestandards.org/Math/Content/HSG/CO/D/12/)
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*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*.

**Day 108**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

**Day 109**

1) Lesson: Geometric Constructions

*Objective:* The students will perform the construction of a perpendicular line through a point on and off of a line.

2) Activity: The students will create various quadrilaterals using perpendicular lines and perpendicular bisectors using protractor and compass and using geometry software

3)Lesson: Geometric Constructions

*Objective:* The students will perform the construction of a parallel line through a given point

4) Activity: The students will create various parallelograms using parallel and perpendicular lines using a protractor and compass and using geometry software

5) Classwork: Geometric Constructions Packet

[CCSS.MATH.CONTENT.HSG.CO.D.12](http://www.corestandards.org/Math/Content/HSG/CO/D/12/)
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*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*.

**Day 110**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

3) Classwork: Quality Control on Drywall

4) Classwork: Tape and First Coat of Drywall Compound

**Day 111**

1) Assessment: Geometric Constructions Formative Assessment

2) Activity: Sports Area Design; the students will use properties of parallelograms and geometric constructions to design a basketball, hockey, baseball, soccer, or football field to the proper scale.

3) Classwork: Unit 5 Review Packet

[CCSS.MATH.CONTENT.HSG.SRT.A.1](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/)

Verify experimentally the properties of dilations given by a center and a scale factor:

[CCSS.MATH.CONTENT.HSG.SRT.A.1.A](http://www.corestandards.org/Math/Content/HSG/SRT/A/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.

[CCSS.MATH.CONTENT.HSG.SRT.A.1.B](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/b/)

The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

[CCSS.MATH.CONTENT.HSG.CO.D.12](http://www.corestandards.org/Math/Content/HSG/CO/D/12/)
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*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*.

**Day 112**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

3) Classwork: Quality Control on Drywall

4) Classwork: Tape and First Coat of Drywall Compound

**Day 113**

1) Activity: Sports Area Design Continued

2) Review: Students will review Unit 5 Concepts

3) Classwork: Unit 5 Review Packet

[CCSS.MATH.CONTENT.HSG.SRT.A.1](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/)

Verify experimentally the properties of dilations given by a center and a scale factor:

[CCSS.MATH.CONTENT.HSG.SRT.A.1.A](http://www.corestandards.org/Math/Content/HSG/SRT/A/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.

[CCSS.MATH.CONTENT.HSG.SRT.A.1.B](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/b/)

The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

[CCSS.MATH.CONTENT.HSG.CO.D.12](http://www.corestandards.org/Math/Content/HSG/CO/D/12/)
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*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*.

**Day 114**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

3) Classwork: Quality Control on Drywall

4) Classwork: Tape and First Coat of Drywall Compound

5) Classwork: Second Coat of Drywall Compound

**Day 115**

1) Activity: Students will use their design to create a full scale outline of their field

2) Review: Students will review Unit 5 Concepts

3) Classwork: Unit 5 Review Packet

[CCSS.MATH.CONTENT.HSG.SRT.A.1](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/)

Verify experimentally the properties of dilations given by a center and a scale factor:

[CCSS.MATH.CONTENT.HSG.SRT.A.1.A](http://www.corestandards.org/Math/Content/HSG/SRT/A/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.

[CCSS.MATH.CONTENT.HSG.SRT.A.1.B](http://www.corestandards.org/Math/Content/HSG/SRT/A/1/b/)

The dilation of a line segment is longer or shorter in the ratio given by the scale factor.

[CCSS.MATH.CONTENT.HSG.CO.D.12](http://www.corestandards.org/Math/Content/HSG/CO/D/12/)
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).*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*.

**Day 116**

1) Classwork: Hang Drywall on Ceilings

2) Classwork: Hang Drywall on Walls

3) Classwork: Quality Control on Drywall

4) Classwork: Tape and First Coat of Drywall Compound

5) Classwork: Second Coat of Drywall Compound

6) Classwork: Sand to Blend Drywall Compound

**Day 117**

1) Assessment: Unit 5 Summative Assessment