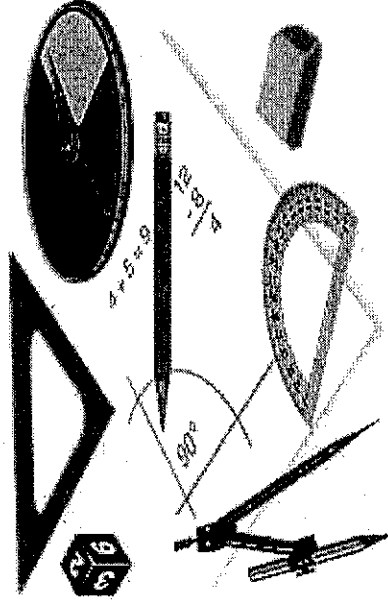


Secaucus
Board of
Education

Geometry

Course Codes: 3100, 3110, 3220, 3230 & 6342

Mathematics Department



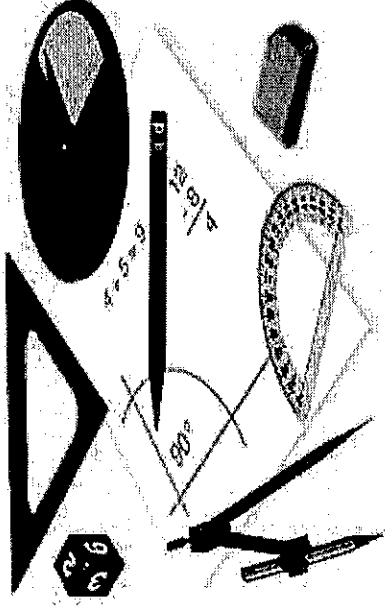
Born on December 2016
Aligned to the NJSL for Mathematics (2016), Technology (2014),
& 21st Century Life and Careers (2014)
Adopted by the Secaucus Board of Education on: December 22, 2016

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Geometry

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District Equity Statement

The Board of Education directs that all students enrolled in the schools of this district shall be afforded equal educational opportunities in strict accordance with the law. No students shall be denied access to or benefit from any educational program or activity or from a co-curricular or athletic activity on the basis of the student's race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability. The Board directs the Superintendent to allocate faculty, administrators, support staff members, curriculum materials, and instructional equipment supplies among and between the schools and classes of this district in a manner that ensures equivalency of educational opportunity throughout this district. The school district's curricula in the following areas will eliminate discrimination, promote mutual acceptance and respect among students, and enable students to interact effectively with others, regardless of race, color, creed, religion, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, gender identity or expression, socioeconomic status, or disability:

1. School climate/learning environment
2. Courses of study, including Physical Education
3. Instructional materials and strategies
4. Library materials
5. Software and audio-visual materials
6. Guidance and counseling
7. Extra-curricular programs and activities
8. Testing and other assessments.

Excerpt from Secaucus Board of Education, Policy 5750, Edited September 2016.

Course Description

In this course students will focus on logical proof and critical thinking when solving problems or evaluating arguments. This Geometry course includes an in-depth analysis of plane, solid, and coordinate geometry as they relate to both abstract mathematical concepts as well as real-world problem situations. Topics include logic and proof, parallel lines and polygons, perimeter and area analysis, volume and surface area analysis, similarity and congruence, trigonometry, and analytic geometry. Emphasis will be placed on developing critical thinking skills as they relate to logical reasoning and argument. Students will be required to use different technological tools and manipulatives to discover and explain much of the course content.

Primary Interdisciplinary Connections

Complex reasoning and solving problems in the following areas:

The Sciences
Technology
Engineering
Skilled Trades and Professions

Potential Course Modifications (ELLs, Special Education, Gifted and Talented)

The teacher will determine, with the assistance of guidance counselors, teacher assistant/aides, educational specialists and/or special education teachers, what modifications will be made for his/her students. Such examples of modifications can include, but not be limited to:

- Extended time as needed
- Modification of tests and quizzes
- Preferential seating
- Alternative/Formative assessment (projects)
- Effective teacher questioning (ranging from simple recall to higher order critical thinking questions)
- Supplemental materials
- Cooperative learning
- Teacher tutoring
- Peer tutoring
- Differentiated Instruction

<p>Unit 1: Points, Lines and Planes</p>	<p>The unit introduces the concepts points, lines, and planes as the basic building blocks of geometry. Segment relationships are explored and constructions are introduced.</p>	
<p>Timing:</p>	<p>2 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.CO.1, G.CO.9, G.CO.12, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigation, and Student Experiences:</p>
<ul style="list-style-type: none"> • How do we develop an awareness of the structure of a mathematical system connecting definitions, postulates, and theorems? • Why are point, line, and plane the undefined terms of geometry? • What are the characteristics of points, lines, line segments, rays, and planes? • Where can we find examples of these in daily life? 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Describe and identify points, lines, and planes. • Determine whether segments are congruent. • Apply the Ruler Postulate and the Segment Addition Postulate to calculate the length of a line segment. • Apply the Segment Addition Postulate and the rules of algebra to write and solve algebraic equations to find the value of a variable. 	<ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

<ul style="list-style-type: none"> • How can we use this information in daily life? 	<ul style="list-style-type: none"> • Construct congruent segments using a compass and straightedge, and/or dynamic geometry software. • Construct arguments to prove theorems about lines. 	<ul style="list-style-type: none"> • Interactive Notebook or Postulate and Theorem Book
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • Compasses • Protractors • Patty Paper 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • Texas Instruments Activity Central Website • Illuminations Website • Mathematics Assessment Project Website • IXL Geometry Practice Website • Department Created Assessments • Geometry Foldables Binder

<p>Unit 2: Angles</p>	<p>The unit uses the concepts points, lines, and planes as the basic building blocks for the properties of angles. Angle relationships are explored and constructions are introduced.</p>	
<p>Timing:</p>	<p>2 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.CO.1, G.CO.9, G.CO.12, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify and classify angles based on its measurement and name them. • Apply the Angle Addition Postulate to calculate the measurement of angles and angle pair relationships. • Measure angles using a protractor. • Construct an angle congruent to any given angle using a compass and straightedge, and/or dynamic geometry software. • Construct the angle bisector of any given angle using a compass and 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems
<ul style="list-style-type: none"> • How do we develop an awareness of the structure of a mathematical system connecting definitions, postulates, and theorems? • How do you use angle relationships to analyze and find missing measures of angles? 		

	<p>straightedge, and/or dynamic geometry software.</p> <ul style="list-style-type: none"> Construct arguments to prove theorems about angles 	<ul style="list-style-type: none"> Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> Vertical and Adjacent Angles Graphing Calculator Activity
<p>Assessments:</p> <ul style="list-style-type: none"> Do Nows Student Participation Oral Questioning Exit Cards ActivExpression Device Results Homework Assignments Classwork Projects Unit Quizzes Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> Interactive Whiteboard Document Camera ActivExpression Devices Whiteboards Dry Erase Markers Erasers Composition Books Foldables Scissors Glue Colored Pencils Activity Sheets TI-84+ Graphing Calculators TI-84 Smartview Software TI-84 Activity Files Laptops with Internet Connection Compasses Protractors Patty Paper 	<p>Resources:</p> <ul style="list-style-type: none"> NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations Texas Instruments Activity Central Website Illuminations Website Mathematics Assessment Project Website IXL Geometry Practice Website Department Created Assessments Geometry Foldables Binder

<p>Unit 3: Parallel Lines</p>	<p>In this unit, students will apply theorems involving parallel and perpendicular lines to solve problems and construct proofs.</p>	
<p>Timing:</p>	<p>2.5 weeks</p>	
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.CO.1, G.CO.9, G.CO.12, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • Can I logically communicate my mathematical reasoning in writing as well as orally? • How do you prove that two lines are parallel? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify pairs of angles formed by two lines cut by a transversal. • Apply the properties of angles formed by parallel lines and a transversal. • Use information about angles to conclude whether or not lines are parallel/perpendicular. • Identify corresponding, alternate-interior, alternate-exterior, and same-side interior angles and then find the missing angles or solve for x. • Construct parallel lines 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems • Interactive Notebook or Postulate

		<p>and Theorem Book</p> <ul style="list-style-type: none"> • <u>Transversals</u> Graphing Calculator Activity • <u>Parallel Lines Cut by a Transversal</u> Graphing Calculator Activity • <u>Properties of Parallel Lines</u> Sketchpad Lab • <u>Starting a Business</u> Activity
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • TI-84+ Graphing Calculators • TI-84 Smartview Software • TI-84 Activity Files • Geometer's Sketchpad Software • Starting a Business Activity Slides • Laptops with Internet Connection 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL</u> Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments</u> Activity Central Website • <u>Illuminations</u> Website • <u>Mathematics Assessment Project</u> Website • <u>IXL</u> <u>Geometry Practice</u> Website • Department Created Assessments • Geometry Foldables Binder

<p>Unit 4: Triangles</p>	<p>In this unit, students learn to classify triangles by their sides and angles, as well as the Triangle Sum Theorem. Then, they will be comparing the lengths of sides or the measures of angles of a triangle using the Triangle Inequality Theorem. The unit concludes with the ways in which to prove figures are similar and the proportions that result from similar figures.</p>
<p>Timing:</p>	<p>3 weeks</p>
<p>Standards:</p>	<p><i>NJSLS for Mathematics:</i> G.CO.9, G.CO.10, G.MG.3, G.SRT.4, G.SRT.5, Standards for MP 1-8</p> <p><i>NJSLS for Technology:</i> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><i>NJSLS 21st Century Life and Careers:</i> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> ● Identify triangles by sides and angles ● Write and solve algebraic equations to find the missing angle measurement, and/or the value of the variable using the Triangle Sum Theorem and Exterior Angles Theorem. ● Identify which side of a triangle is the largest, knowing angle measure. ● Identify which angle is the largest, knowing side lengths.
<ul style="list-style-type: none"> ● How can statements about triangles be proven? ● How do you use coordinate geometry to find relationships within triangles? ● How do you solve problems that involve measurements of triangles? 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> ● Interactive Whiteboard Presentations <ul style="list-style-type: none"> ○ Visual Representations of Concepts ○ Modeling of Examples ● Cooperative Group Investigations and Hands-on Activities ● Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems ● Partner collaboration or individual

	<ul style="list-style-type: none"> • Write and solve proportions to find the missing side lengths in similar triangles. • Determine whether or not triangles are similar based on the given information. • Construct arguments and/or reasons to prove that triangles are similar 	<p>work (depending on the topic and assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Similarity and Proportion Graphing Calculator Activities</u> • <u>Triangle Sum Theorem Proof Activity</u> • <u>Inequalities in One Triangle Sketchpad Lab</u> • <u>Triangle Inequality Sketchpad Lab</u> • <u>Lengths of Corresponding Sides are Proportional Lab</u> • <u>SAS Similarity Lab</u> • <u>SSS Similarity Lab</u> • <u>AAS Similarity Lab</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Tape 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • Department Created Assessments • Geometry Foldables Binder

	<ul style="list-style-type: none"> ● Colored Pencils ● Activity Sheets ● TI-84+ Graphing Calculators ● TI-84 Smartview Software ● TI-84 Activity Files ● Geometer's Sketchpad Software ● Geometer's Sketchpad Activity Files ● Protractors ● Rulers ● Laptops with Internet Connection 	
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<p>Unit 5: Similar Triangles & Trigonometry</p>	<p>The unit is an introduction to trigonometry. The unit begins with solving word problems using similarity and indirect measurement. This leads to the derivation of the sine, cosine, and tangent ratios, including word problems. The unit concludes with the Pythagorean Theorem and its converse, as well as the ratios of 30-60-90 and 45-45-90 and solving problems with those ratios.</p>
<p>Timing:</p>	<p>4 weeks</p>
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.SRT.4, G.SRT.6, G.SRT.7, G.SRT.8, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Use similarity ratios to solve problems. • Use trigonometric ratios to solve right triangles. • Derive the trigonometric formulas • Solve problems and identify right triangles using Pythagorean Theorem. • Derive the 45-45-90 & 30-60-90 triangle theorems.
<ul style="list-style-type: none"> • How do you use proportions to find side lengths in similar polygons? • How do you show two triangles are similar? • How do you identify corresponding parts of similar triangles? • What is the relationship between the sides and angles of right triangles? 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual

<ul style="list-style-type: none"> • How do you find a side length or angle measure in a right triangle? • How do trigonometric ratios relate to similar right triangles? • What is a vector? 	<ul style="list-style-type: none"> • Solve problems using the 45-45-90 & 30-60-90 triangle theorems. 	<p>work (depending on the topic and assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Right Triangles and Trig. Graphing Calculator Activities</u> • <u>Indirect Measurement Lab</u> • <u>Finding Trigonometric Ratios Lab</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • TI-84+ Graphing Calculators • TI-84 Smartview Software • TI-84 Activity Files • Tape Measure • Protractors 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • <u>Department Created Assessments</u> • <u>Geometry Foldables Binder</u>

<p>Unit 6: Congruent Triangles</p>	<p>The unit explores congruence between triangles. Students learn to write triangle congruence statements and proofs involving triangle congruence. The unit concludes with the properties of Isosceles Triangles.</p>	
<p>Timing:</p>	<p>2.5 Weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> G.CO.8, G.CO.10, G.SRT.4, G.SRT.5, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can statements about triangles be proven? • How do you identify corresponding parts of congruent triangles? • How do you show that two triangles are congruent? • How can you tell whether a triangle is isosceles or equilateral? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Show triangles are congruent and solve problems based on that congruence. • State the congruence of corresponding parts knowing congruent triangles. • Complete and write proofs of triangles. • Find the congruent angles of an isosceles triangle given congruent sides. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.)

<ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<ul style="list-style-type: none"> • Find the congruent sides of an isosceles triangle given congruent angles. 	<ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>SSS Triangle Congruence Lab</u> • <u>SAS Triangle Congruence Lab</u> • <u>ASA Triangle Congruence Lab</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • Straws • Rulers • Protractors • Paper Clips 	<p>Materials:</p>	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NICTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • Department Created Assessments • Geometry Foldables Binder

<p>Unit 7: Circles</p>	<p>The unit explores parts of a circle and the relationships between intersecting lines and circles.</p>	
<p>Timing:</p>	<p>3.5 Weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> G.C.1, G.C.2, G.C.3, G.C.4, G.C.5, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p>	<p>Objectives:</p>	<p>Activities, Investigation, and Student Experiences:</p>
<ul style="list-style-type: none"> • Do “how” and “where” a line(s) intersect a circle make a difference? • How can you prove relationships between angles and arcs in a circle? • When lines intersect a circle, or within a circle, how do you find the measures of resulting angles, arcs, and segments? 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify the parts of a circle. • Find the measure of angles given inside the circle, on the circle, or outside the circle. • Calculate the length of an arc in a circle. • Calculate the measurement of angles and arcs in radians. • Calculate the lengths of tangents, secant segments, and chords depending on the location of the intersection. 	<ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

		<ul style="list-style-type: none"> • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Circles</u> Graphing Calculator Activities • <u>Properties of Chords</u> Lab • <u>Inscribed Angles</u> Lab • <u>Tangent Lines</u> Lab • <u>Power of Points</u> Activity
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • TI-84+ Graphing Calculators • TI-84 Smartview Software • TI-84 Activity Files • Patty Paper • Compass • Ruler • Geometer's Sketchpad Software • Laptops with Internet Connection 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NICTL</u> Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments Activity Central</u> Website • <u>Illuminations</u> Website • <u>Mathematics Assessment Project</u> Website • <u>IXL Geometry Practice</u> Website • Department Created Assessments • Geometry Foldables Binder

<p>Unit 8: Analytic Geometry</p>	<p>The unit combines the concepts of both geometry & algebra. Algebraic formulas will be used to calculate the distance between two points, the midpoint of a line segment, additional points on a line segment that partition it to fulfill a certain ratio, the slope of a line, and the equation of a line. Then, all of these concepts will be used to determine whether triangles are congruent, or to classify the type of shape that is contained in the coordinate plane. Finally, the equation of a circle will be covered and what it means for a point to be inside, on, and outside the circle algebraically.</p>
<p>Timing:</p>	<p>2.5 Weeks</p>
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.CO.1, G.GPE.1, G.GPE.4, G.GPE.5, G.GPE.6, G.SRT.5, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How are the Pythagorean Theorem, distance formula, and equation of a circle related to each other. • How does partitioning a segment into two smaller segments relate to calculating the midpoint of a segment? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Calculate the distance between two points using the distance formula. • Calculate the midpoint of a segment when given two points. • Calculate the missing endpoint of a segment when given the midpoint and one endpoint of a segment. <p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the

	<ul style="list-style-type: none"> • Calculate the missing point(s) of a segment that partition a segment into two segments with a given ratio. • Determine the slope of a line that is parallel/perpendicular to a given line. • Write the equation of a line that is parallel/perpendicular to a given line passing through another in the coordinate plane. • Prove that 2 triangles are congruent in a coordinate plane using the distance, midpoint, and/or slope formulas in combination with the 5 methods of proving triangles are congruent. • Use the distance, midpoint, and/or slope formula to classify a triangle based on the coordinates of its vertices. • Find the center, radius, and points on a circle given the equation of the circle. • Calculate the value of a missing variable in the equation of a circle using the algebraic strategy of "Completing the Square". 	<p>Graphing Calculator to Solve Problems</p> <ul style="list-style-type: none"> • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Midpoints in the Coordinate Plane</u> • <u>Graphing Calculator Activity</u> • <u>Distance Formula Lab</u> • <u>Midpoint Formula Lab</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u>

<ul style="list-style-type: none"> ● Homework Assignments ● Classwork ● Projects ● Unit Quizzes ● Unit Test 	<ul style="list-style-type: none"> ● Erasers ● Composition Books ● Foldables ● Scissors ● Glue ● Colored Pencils ● Activity Sheets ● TI-84+ Graphing Calculators ● TI-84 Smartview Software ● TI-84 Activity Files 	<ul style="list-style-type: none"> ● <u>Illuminations Website</u> ● <u>Mathematics Assessment Project Website</u> ● <u>IXL Geometry Practice Website</u> ● Department Created Assessments ● Geometry Foldables Binder
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<p>Unit 9: Transformations</p>	<p>In this unit several different transformations will be explored and their properties will be compared. Function notation will be used to describe transformations and more rigorous definitions will be developed for these transformations. A variety of tools (tracing paper, Geometry software, etc.) will be used to show the effect of a transformation upon a figure. Students will learn to predict the effect of a transformation upon a given figure, find transformations or sequences of transformations that map one figure onto another.</p>
<p>Timing:</p>	<p>2 Weeks</p>
<p>Standards:</p>	<p><i>NJSLS for Mathematics:</i> G.CO.2, G.CO.3, G.CO.4, G.CO.5, G.CO.6, G.CO.7, G.CO.8, G.CO.12, G.CO.13, G.SRT.1, G.SRT.2, G.SRT.3, Standards for MP 1-8</p> <p><i>NJSLS for Technology:</i> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><i>NJSLS 21st Century Life and Careers:</i> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> • What types of transformations are rigid motions? • How can you represent a transformation in the coordinate plane? • How do you recognize symmetry in a figure? • What does it mean for two 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify rigid motions and images. • Describe transformations in the coordinate plane using function notation. • Translate, reflect, rotate and dilate a figure using a variety of tools. <p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the

<p>figures to be congruent? To be similar?</p> <ul style="list-style-type: none"> • Which sequence of transformations can map one figure onto the other? 	<ul style="list-style-type: none"> • Identify line or rotational symmetry of a figure if it exists. Students will be able to construct an equilateral triangle, square and regular hexagon using a variety of methods (compass & straightedge, string, and/or dynamic geometric software). Given congruent figures or similar figures, students will be able to find a sequence of transformations that moves one figure onto the other. 	<p>Graphing Calculator to Solve Problems</p> <ul style="list-style-type: none"> • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Transformations Graphing Calculator Activities</u> • <u>Reflection Lab</u> • <u>Rotation Lab</u> • <u>Flip-n-Slide: Exploring Transformations through Modeling and Computer Games</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • <u>Department Created Assessments</u> • Geometry Foldables Binder

	<ul style="list-style-type: none">• TI-84+ Graphing Calculators• TI-84 Smartview Software• TI-84 Activity Files• Patty Paper• Ruler• Protractor• Geometer's Sketchpad Software• Laptops with Internet Connection	
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<p>Unit 10: Quadrilaterals</p>	<p>The unit explores the family tree of quadrilaterals. Sufficient conditions and properties of the special triangles are explored and applied to problems. Proofs involving quadrilaterals are also created.</p>	
<p>Timing:</p>	<p>2.5 Weeks</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> G.C.3, G.CO.11, G.CO.13, G.GPE.4, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • What determines the classification of quadrilaterals? • What are the similarities and differences between the different quadrilaterals? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Find the measures of interior and exterior angles in polygons • Use the properties of quadrilaterals to find the measurements of angles and the lengths of sides. • Use the properties of quadrilaterals to write and solve algebraic equations. • Identify the members of the quadrilaterals family. • Construct quadrilaterals by applying sufficient conditions. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.)

	<ul style="list-style-type: none"> • Construct arguments to write proofs involving quadrilaterals. 	<ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Quadrilaterals Graphing Calculator Activities</u> • <u>Investigating Parallelograms Lab</u> • <u>Quadrilaterals in the Coordinate Plane Lab</u> • <u>Midsegments of Trapezoids Lab</u> • <u>Properties of Kites Lab</u> • <u>Inscribed Quadrilaterals Lab</u> • <u>Perplexing Parallelogram Activity</u> • <u>Diagonals to Quadrilaterals Activity</u>
<ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Scissors • Glue • Colored Pencils • Activity Sheets • TI-84+ Graphing Calculators • TI-84 Smartview Software 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • <u>Department Created Assessments</u> • <u>Geometry Foldables Binder</u>

	<ul style="list-style-type: none">• TI-84 Activity Files• Geoboard• Rubber Bands• Protractors• Compass• Patty Paper• Rulers• Geometer's Sketchpad Software• Laptops with Internet Connection	
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<p>Unit 11: Area of Figures</p>	<p>In this unit, the area formulas for triangles, quadrilaterals, circles and sectors will be derived. Students will learn to use these formulas to solve application problems, including those that involve the area of complex figures and figures in the coordinate plane.</p>
<p>Timing:</p>	<p>2.5 Weeks</p>
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> G.SRT.8, G.SRT.9, G.SRT.10, G.SRT.11, G.C.5, G.GPE.7, G.GMD.1, G.MG.1, G.MG.2, G.MG.,3 Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How do you find the area of any triangle? • How do you find any missing side lengths and/or angle measures in any triangle? • How do you calculate the area and perimeter of figures in the coordinate plane? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Calculate the area of a rectangle when side lengths are unknown using other formulas (e.g. Pythagorean Theorem). • Calculate the area of any triangle using trigonometric ratios after drawing an auxiliary line from a vertex perpendicular to the opposite side. • Prove the Law of Sines formula and use it to solve problems.
	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and

	<ul style="list-style-type: none"> • Calculate the area of any parallelogram using trigonometric ratios and its area formula. • Calculate the area of any regular polygon using trigonometric ratios and its area formula. • Derive and use the area of a circle formula from the area formula for any regular polygon. • Use the area of a circle formula and the relationship that exists between the degrees of the arc and the area of its sector to derive the equation used to calculate the area of a sector. • Derive the formula for the area of a trapezoid and use it to solve problems. • Derive the formula for the area of a rhombus and use it to solve problems. • Derive the formula for the area of a kite and use it to solve problems. • Calculate the area of complex figures using the area formulas of 2-D shapes. • Apply the area formulas and the distance formula to solve real-world problems. 	<p>assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Area of Other Quadrilaterals Lab</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • <u>Texas Instruments Activity Central</u>

<ul style="list-style-type: none"> ● ActivExpression Device Results ● Homework Assignments ● Classwork ● Projects ● Unit Quizzes ● Unit Test 	<ul style="list-style-type: none"> ● Dry Erase Markers ● Erasers ● Composition Books ● Foldables ● Scissors ● Glue ● Colored Pencils ● Activity Sheets ● Rulers ● Compasses 	<p>Website</p> <ul style="list-style-type: none"> ● Illuminations Website ● Mathematics Assessment Project Website ● IXL Geometry Practice Website ● Department Created Assessments ● Geometry Foldables Binder
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<p>Unit 12: 3D Geometry</p>	<p>The unit looks at ways 3-dimensional figures can be represented on a 2- dimensional plane, a sheet of paper. Surface area and lateral area of these figures and their volumes will be calculated. The unit concludes with comparing surface areas and volumes of similar solids</p>
<p>Timing:</p>	<p>3 weeks</p>
<p>Standards:</p>	<p><u><i>NJSLS for Mathematics:</i></u> G.GMD.1, G.GMD.2, G. GMD.3, G.GMD.4, G.MG.1, G.MG.2, G.MG.3, Standards for MP 1-8</p> <p><u><i>NJSLS for Technology:</i></u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u><i>NJSLS 21st Century Life and Careers:</i></u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>
<p>Essential Questions:</p>	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Identify the vertices, edges and faces in a polyhedron. • Calculate the number of vertices, edges, or edges in a polyhedron using Euler’s Theorem. • Identify the cross-sectional shapes formed by a solid and an intersecting 2-dimensional plane. • Use orthographic projections of a solid to draw a 3- dimensional
<ul style="list-style-type: none"> • Is there a relationship between the area and perimeter of a polygon and surface area and volume of a solid? 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual

	<p>representation of the solid and vice-versa.</p> <ul style="list-style-type: none"> • Calculate the lateral area, surface area, and volume for prisms, pyramids, cylinders and cones. • Calculate the slant height of a regular pyramid and right cone. • Calculate surface area and volume of a sphere. • Calculate the circumference and area of a great circle of a sphere. • Compare volumes of surfaces using Cavalieri's Principle. Students will be able to calculate the similarity ratio of similar figures. • Use the concepts of lateral area, surface area, and/or volume to solve real-world application problems. 	<p>work (depending on the topic and assignment.)</p> <ul style="list-style-type: none"> • Solving Real World Problems • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • <u>Perimeter, Area and Volume</u> • <u>Graphing Calculator Activities</u> • <u>Designing 3D Products: Candy Cartons</u>
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • 3D Solids • Nets • Composition Books • Foldables • Colored Pencils 	<p>Resources:</p> <ul style="list-style-type: none"> • <u>NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations</u> • <u>Texas Instruments Activity Central Website</u> • <u>Illuminations Website</u> • <u>Mathematics Assessment Project Website</u> • <u>IXL Geometry Practice Website</u> • Department Created Assessments • Geometry Foldables Binder

- Scissors
- Glue
- TI-84+ Graphing Calculators
- TI-84 Smartview Software
- TI-84 Activity Files
- Activity Sheets
- Posterboard
- Cardboard
- Highlighters
- Rules
- Protractors
- Compasses
- Cylindrical Counters
- Cartons

<p>Unit 13: Probability</p>	<p>In this unit students will use what they already know about finding lengths of segments and calculating areas of polygons to calculate geometric probability.</p>	
<p>Timing:</p>	<p>1 week</p>	
<p>Standards:</p>	<p><u>NJSLS for Mathematics:</u> S.CP.1, S.CP.7, G.C.51.5, Standards for MP 1-8</p> <p><u>NJSLS for Technology:</u> 8.1.12.A.3, 8.1.12.A.4, 8.1.12.C.1</p> <p><u>NJSLS 21st Century Life and Careers:</u> CRP1, CRP2, CRP4, CRP8, CRP11, CRP12</p>	
<p>Essential Questions:</p> <ul style="list-style-type: none"> • How can we represent the probability of an event using geometric representations and the concept of length or area? • How does probability relate to real world application problems? 	<p>Objectives:</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. • Use theoretical probability to determine the likelihood of an event occurring. • Represent probabilities in multiple ways, such as fractions, decimals, percentages, and geometric area models. 	<p>Activities, Investigation, and Student Experiences:</p> <ul style="list-style-type: none"> • Interactive Whiteboard Presentations <ul style="list-style-type: none"> ◦ Visual Representations of Concepts ◦ Modeling of Examples • Cooperative Group Investigations and Hands-on Activities • Graphing Calculator Demonstrations and Using the Graphing Calculator to Solve Problems • Partner collaboration or individual work (depending on the topic and assignment.) • Solving Real World Problems

	<ul style="list-style-type: none"> • Determine the probability of an event using number lines, coordinate planes and formulas for geometric figures. • Determine the probability of an event involving area. 	<ul style="list-style-type: none"> • Interactive Notebook or Postulate and Theorem Book <hr/> <ul style="list-style-type: none"> • Dartboard Lab
<p>Assessments:</p> <ul style="list-style-type: none"> • Do Nows • Student Participation • Oral Questioning • Exit Cards • ActivExpression Device Results • Homework Assignments • Classwork • Projects • Unit Quizzes • Unit Test • 	<p>Materials:</p> <ul style="list-style-type: none"> • Interactive Whiteboard • Document Camera • ActivExpression Devices • Whiteboards • Dry Erase Markers • Erasers • Composition Books • Foldables • Colored Pencils • Scissors • Glue • Posterboard • Felt (Various colors) • Rulers • Activity Sheets 	<p>Resources:</p> <ul style="list-style-type: none"> • NJCTL Presentations / Teacher Created Interactive Whiteboard Presentations • Texas Instruments Activity Central Website • Illuminations Website • Mathematics Assessment Project Website • IXL Geometry Practice Website • Department Created Assessments • Geometry Foldables Binder

