Curriculum Sample Template – 8 Pages Max. (12 pages for integrated ELA sample)

Grade Level	10	**Content Area**	Math
Course Title (grades 9-12 Only)	Geometry		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year that are foundational to the mastery of the Required Standard(s).*	Prior to this lesson, students are expected to have mastered the following skills: Pythagorean Theorem Able to find distance between two points using distance formula.		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons align to the Program of Instruction described in the application package.*	The lesson is delivered by scaffolding through a sequence of slides, with videos and activities embedded. Students will also have access to these slides by logging into their blackboard account supported by Fuel Education. The Instruction is direct (Tier 1) and also online (Tier2). The content is aligned to STEM. Students will use scientific and engineering process like asking questions, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, evaluating and communicating information.		
Standard Number* and Description *The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.*	**Geometry** Expressing Geometric Properties with Equations (G-GPE) G-GPE.A.1-Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables)*	Smart board, Graphing paper, Graphing Calculators. Computer for submitting assignments through technology platform. Internet access for videos for blended learning activities from Khan Academy or FuelEd.		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Cluster, Standard (e.g., 6.EE.B.7). For HS Math, use Conceptual Category-Domain, Cluster, Standard (e.g., A-REI.C.6).*

Lesson (add as needed)	**Instructional Strategies -** *List and describe teacher actions, lesson by lesson, which will provide students with opportunities to engage the grade-level rigor defined by the Required Standard(s). Indicate alignment of instructional strategies to specific component(s) or content/skill(s) of the Required Standard/component.*	**Student Activities -** *Describe the activities, lesson by lesson, in which students will engage to allow them to master the grade-level rigor defined by the Required Standard(s). Indicate alignment of student activities to specific component(s) or content/skill(s) of the Required Standard/component.*
1	**Objective:** You will learn how to find distances between two points on a plane and evaluate unknown side by using the Pythagorean Theorem. **Key points:** Distance formula Pythagorean Theorem **Activation of prior knowledge:** Teacher will (TW) give students an article about the history of the Pythagorean Theorem. TW ask students to recall the distance formula, Pythagorean Theorem. TW ask students these two questions before giving them an explanation. **Introduction to new material:** Teacher will explain distance formula is a variant of Pythagorean Theorem. TW reference key points. TW model the use of the Pythagorean theorem using real world problems. TW use visuals students can manipulate to see the relationship between the numbers when making the points closer or farther. **Flipped classroom/Blended Learning:** Students will use their black board account to login to fuel education. Student will practice some problem from this website. **Guided Practice and Exploration:** Teacher will guide the students to find distance between two points and find missing side of the triangle using the Pythagorean Theorem. Teacher will show a few examples and then ask students to solve. If 80% of the students give the answers correctly then teacher will give problems for Independent practice. **Independent practice:** Teacher will give different examples for students to master in subject. Teacher will monitor student progress and facilitate student learning. Teacher will work with students one on one or in small group with students who need help and provide them with more examples and models to understand the concept	**SW** write the objective in the note book SW write the key points in their notebook. **SW** follow teacher directions to find out what students currently know about the Pythagorean Theorem. **SW** actively listen while teacher is modeling. SW take notes. . **SW** complete problems from website during guided practice. **SW** take notes and do sample questions. Students will work in groups. SW follow teacher directions to use distances formula between points on a plane. SW work on website problems for guided practice. Students will learn to find distances between points on a plane by using the Pythagorean Theorem **SW** individually work to find missing side of triangle using Pythagorean Theorem. Students needing help will work with teacher to understand the concepts and then work on the questions and challenges provided by the teacher.

	Assessment: TW pass out quiz with 10 problems. Student must score 80% for mastery.	**SW** complete quiz and submit.
2	**Objective:** Students will learn how the points on a circle are related to its center by using the Distance Formula **Key Points:** Circle Center of Circle Radius Diameter Chord **Flipped classroom/Blended Learning:** Students will use their black board account to login to Fuel Education. Student watch this video showing the key points. **Activation of prior knowledge:** TW review the video focusing on the key points listed. **Introduction to new material:** Teacher will summarize the student responses and use the student responses in building the concepts used in the distance formula to find radius for a given point and center of the circle. Teacher will guide the students and elicit responses on how to find the radius center and a point on a circle. Teacher will show a few examples related to concept. Students will be challenged with more problems and students are expected to predict the outcome. **Guided Practice and Exploration:** TW go to website and give students visual examples of using the distance formula. 80% of the students give the answers correctly then teacher will give questions for Independent practice. **Independent practice:** Teacher will give students 10 quiz problems on concept. One problem will be a real life problem. TW instruct students to work out problem and write a paragraph explaining how they solved the problem. Teacher will monitor student progress and facilitate student learning.	**SW** write the objective in the note book **SW** understand the key points and write definitions and Recall the distance formula. **SW** watch the video and take notes on the key points listed in their notes. **SW** listen and watch the video. **SW** take notes and do sample questions. **SW** find for a given center and a point on a circle, and find the radius. Student will watch the videos, take notes and do sample problems. Students will work in groups of three. **SW** work individually on the independent practice.

	Teacher will work with students one on one or in small group with students who need help and provide them with more examples and models to understand the concepts. **Assessment:** TW score independent practice and review with student.	Students needing help will work with teacher to understand the concepts and then work on the questions and challenges provided by the teacher. **SW** submit independent quiz practice.
3	**Objective:** Student will learn how the standard equation of a circle describes the location of points on a circle by applying the Distance Formula. **Key points:** Circle Center of Circle Radius Diameter Chord **Flipped classroom/Blended Learning:** Students will use their black board account to login to Fuel Education. **Activation of prior knowledge:** Teacher will review on standard equation of a circle, and engages the students in asking questions and make students think. How do you express all of the points contained in a circle? How to find given point is on the circle with the given center and radius? **Introduction to new material:** Teacher will summarize the student responses and uses the student responses in building the concepts of the Distance Formula. The points in a circle are all a specific distance, and called the radius, a specific distance away from the center. **Guided Practice and Exploration:** TW instruct student to work with a partner to work on following the slides on the standard equation of a circle for the center and radius. TW assign students to do 10 problems. If 80% of the students give the answers correctly then the teacher will give questions for Independent practice. Teacher will work with students one on one or in small group with students who need help and provide them with more examples and models to understand the concept.	**SW** write the objective in the note book **SW** recall the distance formula, derived using the Pythagorean Theorem. **SW** use FuelEd online program to watch a video to review the key points. **SW** actively engage in the class discussions, asking and answering questions. Students will come up with their views of how the points on a circle are related to the center by using the Distance Formula. **SW** take notes and follow teacher's slides for a better understanding of the concepts. Students will take notes and work on sample problems. **SW** work with a partner of slides. SW work together to solve 10 problems with their partner. Students needing additional help will work with teacher to understand the concepts and then work on the questions and challenges provided by the teacher.

	Independent practice: Teacher will assign 10 problems to check students understanding. **Assessment**: TW score and review the independent practice and give students feedback.	**SW** work individually on 10 problems to check student understanding of the objective. **SW** submit independent practice for scoring and feedback.
4	**Objective:** Students will learn how to create a perfect square trinomial by completing the square. **Key points:** Perfect square. **Activation of prior knowledge:** Teacher will review the different types of probing question on the concept, "How can we create an expression that can be factored into a perfect square?" "How do we factor the expression?" **Introduction to new material:** Teacher will summarize the student responses from the activation of prior knowledge. TW ask what is a trinomial expression and how do we factor into perfect square. TW model a trinomial expression and show students how to remember the formula using SOAP. Example: $a^3 \pm b^3 = (a$ [same sign] $b)(a^2$ [opposite sign] ab [always positive] $b^2)$ **Guided Practice and Exploration:** Teacher will solve some problems then show a video of solving problems and then teacher will ask the students to collaborate and solve in their groups. **Flipped classroom/Blended Learning: TW assign students work on FuelEd for independent practice**. **Independent practice:** Teacher will watch and walk around the lab to see student progress in learning to create a perfect square trinomial by completing the square using the online learning program. Teacher will work with student's one on one or in small group with students who need help. **Assessment**: TW obtain results of student independent online work results and share with students.	**SW** write the objective in the note book **SW** understand the key point and write the definition. **SW** actively engage in the class discussions, asking and answering vocabulary questions; expression, factored, perfect. Students will come up with their views on factors, expressions, perfect, square, and define binominal and trinomial expressions. **SW** listen to modeling and take notes. **SW** work in groups/Individual to solve the problems. Students will use Fuel education material to complete practice problems pertaining to the objective. **SW** work on practice problems on FuelEd program. Students who are struggling will work with the teacher in a small group. **SW** complete online independent work.

S.A.	*Provide an opportunity for the student to complete the summative assessment items which is clearly separate from instruction and guided or independent practice, and in which the student is assessed independently. In the Student Activities column, provide a brief description of the summative assessment (S.A.) items that will allow students to demonstrate mastery of the rigor of the Required Standard(s)/components, and the context in which the items will be administered.*	Students will derive the equation of a circle given the center and radius using the Pythagorean Theorem. Students will create a perfect square trinomial by finding the constant term that should be added to an expression to complete a perfect square trinomial. The student will work independently,

Summative Assessment Items and Scoring: *Below, provide at least three Summative Assessment Items that together accurately measure student mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard(s). For each assessment item, provide an answer key or scoring rubric which clearly describes how assessment items are to be scored and how points will be awarded, such that mastery of the application of the content and/or skills as defined by the grade-level rigor in the Required Standard is clearly demonstrated by an acceptable score.*

Summative Assessment Item 1 (clearly identify answer key/scoring rubric, and acceptable score):

1 .Write an equation for a circle with a radius of 2 units and center at (1, 3).

Summative Assessment Item 2 (clearly identify answer key/scoring rubric, and acceptable score):

2. Write an equation for a circle given that the endpoints of the diameter are (-2, 7) and (4, -8).

3. Complete the square to find the center and radius of the circle for $4x^2 + 4y^2 - 4x + 2y – 1 = 0$.

Summative Assessment Item 3 (clearly identify answer key/scoring rubric, and acceptable score): (add as needed):

4. Complete the square to find the center and radius of the circle given by the following equation.

$$X^2+Y^2+4X-4Y-17 = 0$$

Answer Key

1. **$(x-1)^2+(y-3)^2= 4$**

2. **$(x-1)^2+(y+1/2)^2=65.25$**

3. **$(x-1/2^2+(y+1/4)^2=(3/4)^2$ Center(1/2,-1/4) radius=3/4**

4. **Center: (-2,2) Radius: (r=5)**

Scoring Rubric: scoring is based on the following criteria

1. *If all the questions are answered correctly,*
2. *Equation are written correctly and*

Content	Skills	Rubric Score
Expressing Geometric Properties with Equations	Student solved the problems including and involving relationships between steps, able to show evidence how they got the answer and show all the steps in solving equations with a correct answer.	4
	Student solves the problem with a few missing steps but able to show relationship and get the correct answer.	3
	Students is able to get the correct answer but no evidence of relationship between steps.	2
	Students is not able to get the correct answer and has not given any evidence or steps to solve the given problem.	1

Total Points 16

Mastery 16-14 = 90-100%

Mastery 13-12= 80-89%

Proficient 11= 70%

11 and Below= Reteach/Retest