

**Lesson Title: Construction of a Tangent Line**

**Unit Title: Circles**

**Teacher Candidate: Jessica Webley**

**Subject, Grade Level, and Date: Geometry, 10<sup>th</sup> grade, February 6, 2014**

**Placement of Lesson in Sequence**

This is the final lesson in the sequence. It follows three previous standards in the cluster.

**Central Focus and Essential Questions**

- What is a tangent line?
- How do I construct a tangent line from a given point outside the circle to the given circle?

**Content Standards**

HSG-C.A.4 Construct a tangent line from a point outside a given circle to the circle.

**Learning Outcomes**

Students will be able to do this construction.

**Assessment**

Students will be given a beginning exercise at the beginning of the next class period in order to determine if they can perform the construction, and thus mastered the standard.

**Learning Targets**

I will be able to construct a tangent line from a point outside the circle to the given circle.

**Student Voice**

The learning target will be written on the whiteboard in the front of the classroom. As a class, we will read it aloud at the beginning of the period. Students will be asked if they understand it. Students will write it down at the top of their notes.

**Prior Content Knowledge and Pre-Assessment**

Since this is the last standard in the unit/learning progression, students will know a lot about the properties of circles. Students will know how to construct other constructions such as inscribed and circumscribed circles of a triangle.

**Academic Language Demands**

**Vocabulary & Symbols**

- Tangent
- Perpendicular bisector
- Compass
- Straightedge

**Language Functions**

- Understanding the language is essential in order for the students to properly do the construction.

**Precision, Syntax & Discourse**

**Mathematical Precision:**  
Students will have to be precise in as they do the construction or else they will not find the tangent line.

**Syntax:**  
Students will be able to write complete and coherent sentences using the correct vocabulary.

**Discourse:**

**Language Target**

I will be able to explain my

**Language Support**

I will model the language by using

**Assessment of Language Target**

The written response will be

process in written form using the correct vocabulary.	the correct vocabulary words throughout my lesson. As students complete their written responses, I will be walking amongst them in order to monitor their progress and help as needed.	submitted when they complete it the following day as a beginning exercise, which will be used for assessment.
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**Lesson Rationale (Connection to previous instruction and Objective Standards)**

This lesson is rational because it is the fourth and final standard in the unit/learning progression. I am teaching exactly what the standard is.

**Differentiation, Cultural Responsiveness and/or Accommodation for Individual Differences**

I will be available to help any student struggling and will do my best to help each individual learn the learning target. Students will know that they are welcome to ask me any question at any time. I will also make sure to ask the students if they need clarification or help throughout the whole lesson. If they are too shy to ask for help, I will be walking around the room monitoring so I can help when I notice it being needed.

**Materials - Instructional and Technological Needs (attach worksheets used)**

Paper, pencil, compass, straightedge

**Teaching & Instructional Activities**

Time	Teacher Activity	Student Activity	Purpose
5 min	Go over the learning target and ask students if they understand it. Ask students if they have any ideas as to what we might be doing today to accomplish the learning target	Write it in their notes and ask questions and share ideas with class	So that they are aware of what the learning target is and to get students talking about the learning target.
10 min	Go over language target. Go over vocabulary words	Write in their notes and ask questions.	So students know the vocabulary and the language target.
15 min	Introduction to Euclid's <i>Elements</i> via youtube video "Greek Mathematics (Part 1)"	Listen and take notes	To gain an understanding of the history of math
5 min	Overview of Euclid's Book 3, Prop 17	Listen and take notes	In order to see how to do the construction
15 min		In groups try to do the construction using Euclid	To achieve the standard
5 min	Do the construction of the students	Write it down in notes	So students know how to do it
5 min		Practice doing the construction correctly	
**10 min	** At the beginning of next period. Give students beginning exercise.	Students are to complete it and turn it in.	In order to assess whether or not they have achieved the standard.

Name \_\_\_\_\_

Date \_\_\_\_\_

### Beginning Exercise

1. Construct a tangent line from a point outside the circle to the given circle.

2. Explain in words your process in order to complete the above construction.