Lesson Plan

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The Unit Circle Project

By: Amanda Martin
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Math
Grades 9–12

Introduction

Students will complete a project about circles! Students will discover that all circles are similar and contain radii, chords, inscribed angles, and more. Students will create their own circles and apply the inscribed angle theorem.

Learning Objectives

Students will prove that all circles are similar and identify and describe the relationship among inscribed angles, radii, and chords. (Common Core State Standards: Math HSG.C.A.1 and HSG.C.A.2)

Materials Needed

- Pennies, lids, bottle caps, or other circular objects
- Notebooks/journals/paper
- Construction paper
- Protractors

Procedure

1. Draw or display two or more circles on the board. Have students gather in groups of five. Give each group some tangible circles (i.e. pennies, lids, bottle caps, etc.). Then, ask groups the following question: Are all circles similar? Students should discuss this question with their group and use the tangible circles as a guide for discussion for roughly 3-5 minutes.

2. Discuss the following terms with the class: translate and dilate. Then, show this Khan Academy video clip about circles.

3. Review how to determine a circle's diameter and circumference using the radius. Now, display the following picture on the board. Ask students if the two circles are similar and how. Then, show the class how dilations and translations prove that the two circles are similar.

4. Introduce the **inscribed angle theorem**. Discuss: **central angle, chords, radii, and inscribed angles**. Demonstrate the theory with the class by creating a circle. Create and label angles within the circle to prove the inscribed angle theorem. Students should be directed to take well-detailed notes during this portion of the lesson. You may create an additional circle or display a new circle on the board for students to gain additional exposure to the inscribed angle theorem.

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5. Students will participate in the Circle Project! Give each student a piece of construction paper. Students must create their own circle using protractors and label the radii, central angle, and inscribed angles. Allow students no more than five minutes to complete their circles.

6. Students should work in groups of two to prove the inscribed angle theorem within one another's circles. Students should use the back side of their construction paper. Partners should spend the remaining time of the class period working on the theorem. Students will turn in their construction paper for teacher evaluation.

Evaluation

To evaluate student learning, each student will turn in their individually constructed circle and work proving the inscribed angle theorem. Students must have each angle properly labeled and each step represented on their papers.