

# Geometry Activities in Desmos

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*9th & 10th Grade Geometry*



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## 1. GEOMETRY ACTIVITIES

### 1.1. INTRODUCTION

Activities created in Desmos provide students with opportunities to collaborate through inquiry-based lessons or to communicate understanding of geometric content in class discussions. The purpose of these activities is to augment the geometry curriculum being taught in the classroom. It can be especially useful to break up the monotony of the daily routine, incorporating the use of technology tools, and providing students with meaningful learning opportunities.

### 1.2. MATERIALS

Teachers will need a computer, laptop, or tablet that can navigate the web to [teacher.desmos.com](https://teacher.desmos.com) and a personal account in Desmos (which can be set-up for free). In order to utilize these activities with students, there should be at least one computer, laptop, or tablet for every two students with the ability to navigate the web to [student.desmos.com](https://student.desmos.com).

### 1.3. OVERVIEW

For each activity, teachers can create a Class Code when they are ready to use these in class.

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#### 1.3.1. SYMMETRY CARD SORT

In this brief card sort activity, students sort diagrams that have reflection symmetry, rotational symmetry, both symmetries, or neither symmetry. This can be used to evaluate student knowledge of the types of symmetry. Its use might be most helpful as a review activity at the end of a unit/chapter.

<https://teacher.desmos.com/activitybuilder/custom/594c0b4e7722cc060e4d9e71>

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#### 1.3.2. TRIANGLE INEQUALITY

This activity is designed to be used in conjunction with College Preparatory Mathematics (CPM) Core Connections Geometry, Section 2.3.1. It is intended to be used as an inquiry-based lesson with the teacher providing time for students to first wrestle with the relationships on their own. Toward the end of the class, teachers should pull the class together and facilitate a conversation about the key learning outcomes.

There are two objectives: (1) identify the Triangle Inequality relationship, and (2) given two side lengths, determine the minimum and maximum length of a third side necessary to form a triangle. Creating a chart for students to collect their data displaying all the lengths and triangle formed answers in one place may make it easier for students to see the Triangle Inequality relationship.

<https://teacher.desmos.com/activitybuilder/custom/5953e815c1e80c02fb2f1caa>

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### 1.3.3. ANGLE VOCABULARY

This activity has students marking angles in diagrams with three or four intersecting lines using vocabulary for adjacent, vertical, corresponding, alternate interior, same-side interior, alternate exterior, and same-side exterior angles. This can be used to start a dialogue with students about some of the common misconceptions of the types of angles in these diagrams.

<https://teacher.desmos.com/activitybuilder/custom/595e3801d6881107dea92974>

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### 1.3.4. ANGLE VOCABULARY CARD SORT

This card sort activity can be used to determine how well students know key vocabulary related to types of angle relationships – vertical, corresponding, alternate interior, same-side interior. This can be used to evaluate student knowledge of the types of angles. Its use might be most helpful as a review activity at the end of a unit/chapter.

<https://teacher.desmos.com/activitybuilder/custom/596e0810fbf7d255f7f7bcf6>

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### 1.3.5. SLOPE RATIOS

This activity is designed to be used in conjunction with CPM's Core Connections Geometry, Section 4.1.3. This lesson is the last in a series of lessons preparing students for the introduction of the tangent ratio.

The objective is to use the concept of triangle similarity with a collection of slope angles and slope ratios to determine the length of a side or the measure of an acute angle in a right triangle. At the end of the activity, students are challenged to estimate side length or angle measure for triangles that are not similar to the given triangles. Creating a resource document for students that includes right triangles for students to record different slope angles and slope ratios is beneficial since this resource is used throughout the activity.

<https://teacher.desmos.com/activitybuilder/custom/59807a7af7738925b2e0f12f>

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### 1.3.6. USING THE TANGENT RATIO

This activity is designed to provide students with an opportunity to demonstrate their ability to use the tangent ratio to solve for side lengths in right triangles. This is intended to be used at the end of a unit/chapter to assess student learning for a key geometric relationship.

<https://teacher.desmos.com/activitybuilder/custom/596e14e147a14f7eaf176e56>

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### 1.3.7. TRIG RATIO CARD SORT

In this brief card sort activity, students sort right triangle diagrams according to the trig ratio used to solve for an unknown quantity. Once the card sort is complete, students use three trig ratios to calculate the missing side length or angle measure.

Watch for students who use the trig ratios correctly, but get incorrect answers due to the mode of their calculator (they should be using degree mode). Successfully completing these tasks requires students to have experience using inverse trig ratios.

<https://teacher.desmos.com/activitybuilder/custom/5952707532779755555af6c7>

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### 1.3.8. SPECIAL RIGHT TRIANGLE CARD SORT

In this brief card sort activity, students sort triangles by the type of special right triangle: 30-60-90, 45-45-90, Pythagorean Triple, or none of these.

Students should be cautious to look carefully at each diagram. Some of the triangles are drawn to deliberately mislead the students. Student mistakes provide an opportunity to discuss valid methods for checking to verify the type of triangle.

<https://teacher.desmos.com/activitybuilder/custom/59764b3d0dbb1871252fd928>