

Pythagorean Theorem – A Co-Teaching Lesson Plan

Co-Teaching Approaches

A “(Y)” in front of the following list items indicates the approach is outlined in the lesson. An “(N)” in front of the following list items indicates the approach is not outlined in the lesson.

- (N) Parallel Teaching
- (Y) Team Teaching
- (N) Station Teaching
- (N) One Teach/One Observe
- (Y) Alternative Teaching
- (Y) One Teach/One Assist

Subject

Grade 8 Mathematics

Strand

Measurement and Geometry

Topic

Working with the Pythagorean Theorem

SOL

- 8.9. The student will
- verify the Pythagorean Theorem and
 - apply the Pythagorean Theorem.

Outcomes

The student will use concrete materials to verify the Pythagorean Theorem then apply that knowledge to real life situations.

Materials

- Scissors
- One Centimeter Grid Example (attached)
- Triangle on One-Centimeter Grid (attached)
- Problems Using Pythagorean Theorem (attached)

Vocabulary

diagonal, distance, hypotenuse, legs, length, Pythagorean Theorem, right angle, right triangle, square root, triangle

Co-Teacher Actions

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
Anticipatory Set	Alternative Teaching	GE reads the story <i>What's Your Angle, Pythagoras?</i> or parts of the story to the class. GE reviews the parts of a right triangle while reading the story.	SE pulls a group of students who need pre-teaching. SE models how to verify the Pythagorean Theorem. Reviews the vocabulary and how to find the area of a square.
Lesson Activities/ Procedures	Team Teaching	<ol style="list-style-type: none"> 1. GE gives each student a sheet of One-Centimeter Grid Example, the Triangle on One-Centimeter Grid worksheet, and scissors. 2. GE has students draw three squares on their grid paper. The sides of the squares should be the lengths of the sides of the triangle. GE instructs students to label the squares a^2, b^2, and c^2. Students should cut out the squares and place them next to the corresponding sides. 3. GE displays the Pythagorean Theorem and has students place the two smaller squares on the larger. Students need to cut one of the square so that it fits. 4. GE monitors student work and discussions. 	<ol style="list-style-type: none"> 1. SE assists with the distribution of materials. 2. SE models while GE explains and then monitors groups for accuracy. 3. SE discusses with students how they have verified the Pythagorean Theorem. SE asks students to state it in their own words to a partner.
Guided/ Independent Practice	One Teach/One Assist	GE monitors the students to make sure they are identifying the parts correctly.	SE models a word problem for the class. SE shows students how to determine the

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
	Alternative Teaching	GE distributes copies of the Problems Using the Pythagorean Theorem worksheet and has students work in small groups to illustrate and solve each word problem in the Problem column.	right angle and hypotenuse. Students identify the right angle and then draw a line “like shooting an arrow” to the hypotenuse. SE works with a small group of students to provide scaffold support such as reading of the problem, the illustration, and the steps to solve.
Closure	Alternative Teaching	GE uses this time to pull together a group and reteach for students who are still struggling.	SE asks each group to share one problem with the class from the Problem column on the Problems Using the Pythagorean Theorem worksheet.
Formative Assessment Strategies	Team Teaching	GE observes students during small group. GE listens to their explanations of the problems they share.	SE observes students during small group. SE listens to their explanations of the problems they share.
Homework	Alternative Teaching	GE asks students to respond to the question: <ul style="list-style-type: none"> • Can a right triangle be formed with sides of lengths 8, 10, 15? Why or why not? 	SE asks students to explain how they determine the hypotenuse of a right triangle.

Specially Designed Instruction

- Teacher will work with a students to develop a picture of the scenario in the word problems in the word column of Problems Using the Pythagorean Theorem worksheet.
- Teacher will work with students to model to verification of the theorem. Teacher will provide additional examples for more visual representations.
- Teacher will collaborate with students to create a graphic organizer of the steps necessary to solve a problem using the Pythagorean Theorem.

Accommodations

- Precut triangles for students.
- Color code the hypotenuse and legs of the triangle.
- Display right triangles in different directions so students understand that the hypotenuse is across from the right angle.
- Reduce number of problems.

Modifications

- For those students who require a modified curriculum, teacher can modify expectations to just finding the unknown value for the hypotenuse, and not the legs.
- Curriculum can be modified so that students are finding the area of the squares and triangles.

Notes

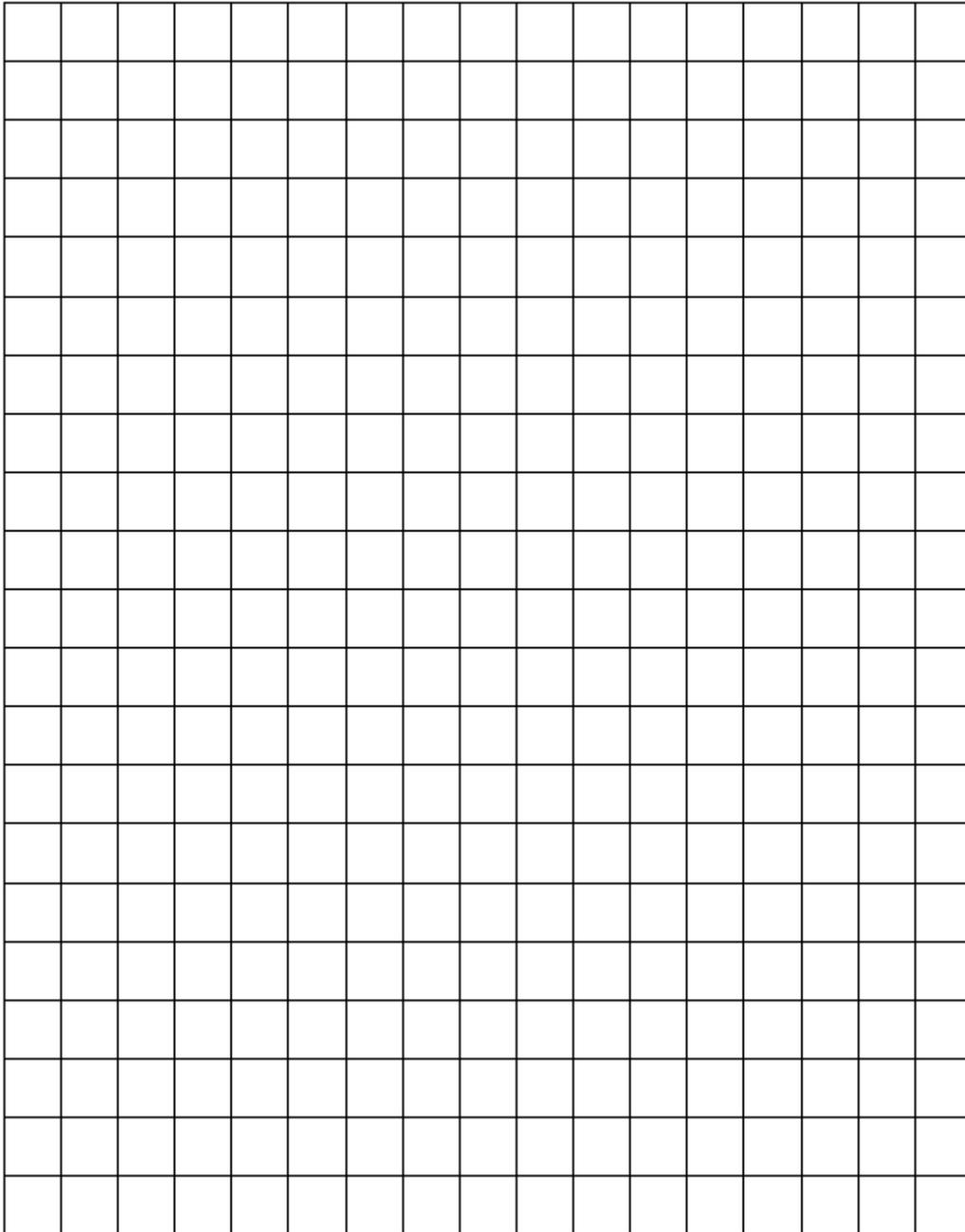
- “Special educator” as noted in this lesson plan might be an EL teacher, speech pathologist, or other specialist co-teaching with a general educator.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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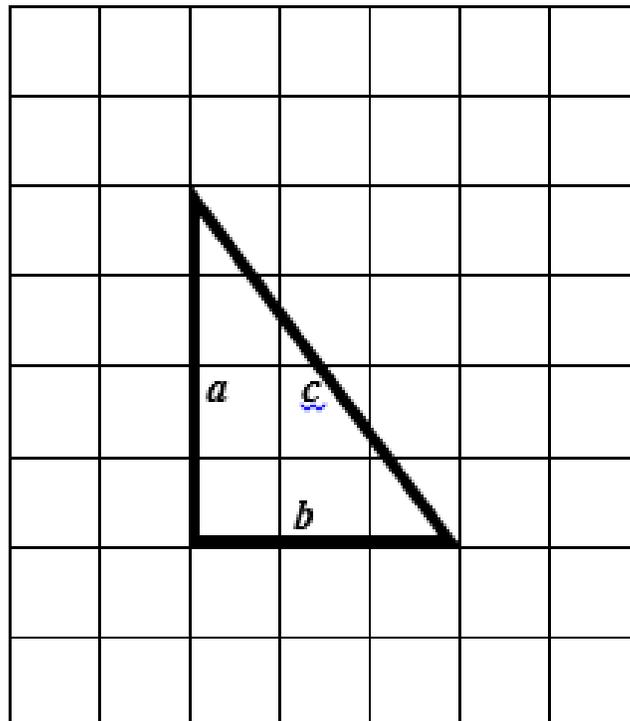
One-Centimeter Grid Example

One-Centimeter Grid



Triangle on One-Centimeter Grid

Triangle on One-Centimeter Grid



Problems Using the Pythagorean Theorem

Problems Using the Pythagorean Theorem

Name _____ Date _____

Problem	Drawing	Work	Answer (with Label)
What is the length of a garden hose that is stretched diagonally corner-to-corner across a yard that measures 72 meters long and 60 meters wide? Round to the nearest meter.			
You're locked out of your house. The only open window is on the second floor, 25 feet above the ground. There are bushes along the edge of the house, so you will need to place the ladder 10 feet from the house. What length ladder do you need to reach the window?			
You've just picked up a ground ball at first base, and you see the other team's player running toward third base. How far do you have to throw the ball to get it from first base to third base, throwing the runner out? The distance between each base is 90 ft.			
The diagonal of a TV screen is 26 inches. The screen is 18.8 inches wide. How high is the screen?			