**Lesson Objective**: Students will be able to use the Pythagorean Theorem to solve for missing sides of right triangles as well as apply it to real world problems.

**Warm Up**: On warm up paper (or in journal), have students solve two equations:

1. 4^2 + x^2 = 9^   and 2) 4^2 + 9 ^2 = x ^2

 Follow up question (discuss with partners): How are these two equations similar?  How are they different? What is the major difference when solving these two equations?

\*After discussion, remind students that this is the difference between solving for a missing leg and solving for a missing hypotenuse of a right triangle.

**Math Libs**: Use a previously created template such as the one below, or create your own.  Handout mathlibs worksheet to students. Put multiple choice task questions around the room.  Each answer has a different piece to add to the Math Lib story (like Mad Libs). Do one example with students together.  Then assign students to a number to start with. Students will move around the room working in groups of 2-3, solving math lib problems.  It is helpful to put the more difficult problems in a place you can easy access in case kids have questions. As they work, move around the room to assist those students who need more one on one.

[Math Lib Example - Pythagorean theorem](https://www.teacherspayteachers.com/Product/Pythagorean-Theorem-Math-Lib-754408)

When students are finished with the problems and have completed their math lab, direct them to the anchor activity choices (pre-taught expectations while doing these).  When most students are finished with the math lib, re group and share different math lib stories, go over some of the challenging problems.

**Anchor Activities For Students Who Finish Early:**

Create Your Own Word Problems:  Help create problems for your classmates to solve.  Write and illustrate word problems that can be solved using math from our current unit.

 Step 1: Write the word problem on the “Create Your Own” worksheet

 Step 2: Illustrate and color your word problem so we all understand the

problem.

Step 3: Solve your problem and provide an answer for us to use as a guide in

Class.

      \*Sample from a current students:

 

Sudoku/Shikaku/Kakuro:  Sharpen your brain!  Go to the puzzle binder and grab a puzzle to work on.

\*These puzzles were each taught at the beginning of the year

Online Math Games:  If a chromebook is available, go to [www.math-play.com](http://www.math-play.com) .  Choose 8th grade level and choose any of the games to play.  Please use headphones.

 \*The chromebook carts are often being used by other departments and/or or state testing..  At those times, I can usually borrow 5 - 10 chromebooks for the day.

**Exit Ticket:**Hand out random Pythagorean theorem problems (both word problems or just triangles for students still working to understand basics).  As students exit the classroom, they must hand you the card and tell you if they are solving for a missing leg or a missing hypotenuse.  They do not need to solve.