Exploring the Pythagorean Theorem Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SOL 8.10 Date \_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_

***Let’s Review!***

When do we use the Pythagorean Theorem?

What is the Pythagorean Theorem?

What do the variables *a*, *b*, *c* represent in the theorem?

Which side(s) can be used interchangeably? Which side(s) cannot be used interchangeably?

***We are now going to be rotating among stations to explore right triangles and the measurements of their sides. With your partner/group complete each station and make sure to show all your work!***

Station 1: *Is it a right triangle?*

Using the different pipe cleaners, measure each to the nearest centimeter and answer the following questions.

|  |  |  |  |
| --- | --- | --- | --- |
| Red | Yellow | Blue | Work |
|  |  |  |  |
| Green | White | Orange | Work |
|  |  |  |  |

Which of these combinations is not a right triangle? Why not?

Which of these combinations is a right triangle? Why?

Station 2: *What is it going to take?*

Using the pipe cleaners, measure each to the nearest centimeter and find the missing side to make a right triangle. Round to the nearest centimeter if necessary.

|  |  |  |  |
| --- | --- | --- | --- |
| Green (*a*) | Orange (*b*) | What is *c*? | Work |
|  |  |  |  |
| What is *a*? | Blue (*b*) | Yellow (*c*) | Work |
|  |  |  |  |

In the space below, measure and draw a line segment that would represent side *c* of the green & orange right triangle.

In the space below, measure and draw a line segment that would represent side *a* of the blue & yellow right triangle.

Which triangle needed the longest side to create a right triangle? What about the two given sides do you think caused the length of the side?

Station 3: *Triples*

Pythagorean Triples are a set of all positive integers for a, b, and c that fits the Pythagorean Theorem. Fill in the table to help you find several of the triples and then answer the following questions.

|  |  |  |  |
| --- | --- | --- | --- |
| *a* | *b* | *c* | Work |
|  | 4 | 5 |  |
| 6 |  | 10 |  |
|  | 12 | 13 |  |
| 9 | 12 |  |  |

The directions stated that triples are a “set of all positive integers”. What is the other real number sub category that better describes these numbers?

Using the first triple (3, 4, 5) how can we create the triple 6, \_\_\_\_, 10?

Using the first triple (3, 4, 5) how can we create the triple 9, 12, \_\_\_\_\_?

Using the grid paper, represent the *a*2, *b*2, and *c*2 for the following triples. In the box, sketch a picture and label each of your drawings from the grid paper.

* 3, 4, 5 draw *b*2 and *c*2. How can those squares be used to find *a*2? Then *a*?
* 9, 12, 15 draw *a*2 and *b*2. How can those squares be used to find *c*2? Then c?