

# Water Pipe Angle Finder

## Teacher's Guide

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### The Initial View (Introducing the Activity)

Obtain the items needed for making your *Water Pipe Angle Finder*. Find a suitable outdoor place to practice “angle finding”. A gym will work as well! Some may have trouble finding the protractor’s center mark in order to attach the tape and string.

While the students have their eye plastered to their *Water Pipe Angle Finder*, they won’t always be watching where they are going!!! Remind them to stand in one spot when using their angle finder. Discourage wandering around the playground like a high sea’s one-eyed pirate looking for treasure! For best results, the rocket, clock, or whatever they are sighting on needs to be centered in the water pipe while they take the angle measurement. They may have to back up or get closer to get a good picture through their *Water Pipe Angle Finder*. Hold the finished *Water Pipe Angle Finder* level. Notice the string hangs straight down, pointing toward 90 degrees. As you move the *Water Pipe Angle Finder* up even slightly, the string still hangs straight down. However the angle they read isn’t correct. Use the correct set of numbers to measure your angle, if your protractor has two sets of numbers. Practice looking at different objects! Measuring the angles of moving objects can be very difficult and will take practice!

### Take a Deeper View! (More Science)

In upcoming activities the students will be using their *Water Pipe Angle Finder* to gather some important math information. The location of an object can be partially described by its **Displacement in Degrees**. (Locating and measuring are important skills both in math and science!) In addition they will be introduced to **Triangles**, the basis for **Trigonometry**. Whoa, don’t worry, the kids won’t be doing any heavy duty trigonometry calculations or end up with a pocket protector and funny glasses! The trigonometry functions have already been converted to very user-friendly formulas so the students will simply plug in and calculate!

### More and Bigger Views! (Additional Classroom Ideas)

1. Use their *Water Pipe Angle Finder* to locate objects above their line of sight.
2. This device is a lot like an early navigation instrument called a **Sextant**. Have the kids research this important historical device. Let them identify how their instrument is similar and different. What was being measured with a sextant? How was this information important? (The sextant is used to locate the Sun. Remind them NEVER, for ANY reason look at the Sun with their *Water Pipe Angle Finder* or any other device!)
3. **Longitude** and **Latitude** are based on degrees and the 360 degree circle called Earth! Have the kids research the latitude and longitude lines and degree measurements!
4. Find out from a carpenter or an architect how they use angles in their jobs.
5. Use drawings in books or magazines for protractor practice!
6. Research the special name for angles less than 90 degrees, more than 90 degrees, and exactly 90 degrees. (acute, obtuse, and right angles)
7. How did ancient sailors use degrees to locate where they were on the high seas?
8. Find examples of triangles used in building supports, bridges, or other structures.

### Answers

1. (360 degrees, 180 degrees) 2. (90 degrees) 3. (gravity)