

## How tall?

This activity is best for children in the middle grades, although I've used it with second and third graders. I like it because it gives them a chance to relate things they are learning in math in a new environment.

The objective is:

- to calculate the height of a tree using a simple measuring device.

Background:	When I take my troops on nature walks, they often ask questions about how tall trees grow and how long they live. This activity gives them the opportunity to estimate (or guess) the height of trees, then measure the height without leaving the ground. They are given the opportunity to learn how to use a simple measuring device to approximate the height of a tree. This exercise can also be used with anything that is very tall – buildings, utility poles, flag poles.
Skills:	The children should be able to understand the difference between approximate and exactly..
Age:	Grades 2 – adult
Material	A triangular shaped piece of cardboard (see diagram), safety glasses, a piece of rope about 50 feet long or a tape measure.
Activity:	Point to a rather tall tree and ask the children how tall they think it may be? Be sure the tree that you point to has some clearing in front of it, so you can walk up to the tree. Once you have several guesses, take out the measuring device and have one or two of the children sight the top of the tree. To sight the tree, hold bottom side of the triangle parallel to the ground, with the straw side moving up and away from the child's eye. Be sure to have the child who is sighting the tree wear the safety glasses. Have the child move forward or backward until the top of the tree is visible through the tip of the straw while keeping the bottom parallel to the ground. Hand the rope or tape measure to two of the children. Now measure the distance between the child who sighted the top of the tree and the tree. That distance is the height of the tree.
Discussion:	Measure the two right angle sides of the cardboard triangle. Explain that since the triangle that they were using to measure the tree had two equal sides, it is safe to assume that the distance that they stood away from the tree to sight the top is the height of the tree. Usually, the children who had some math experience with right triangles would make a comment about learning this in school. If the group is

	young or still doesn't understand, I would explain that if the tree fell at its base, the tip would land right where the sighter was standing. Then use rope or tape measure to show how one side of the right triangle is the same length as the other.
Junior Badge:	World or Today & Tomorrow Dabbler H.2

Making the measuring device:

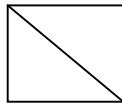
Materials: tag board, a wooden art stick, a plastic drinking straw.

1. Cut a piece of tag board into a square about 5 inches by 5 inches.



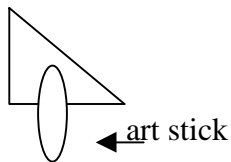
A square five inches on each side.

2. Cut the square on the diagonal from one corner to the opposite. You should have two right triangles.

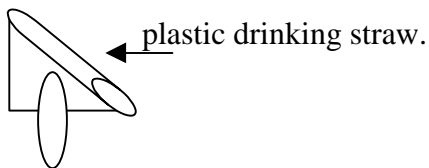


Two right triangles.

3. Tape the art stick to one "side" of the right triangle.



4. Tape the drinking straw to the long side of the right triangle.



5. When sighting a tree top, keep the bottom flat or parallel to the ground and look through the drinking straw.

