**Find 1 object in your community that you can indirectly measure by using similar triangles.**

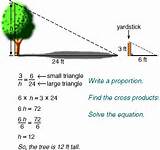
You must use 3 different methods of the 4 we looked at in class.

Collect all your data and clearly record it in diagrams. Show every unit conversion!

Create a Power Point or Prezi to share your work with the class.

**Methods:**

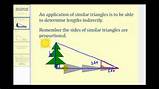
1: Two separate similar triangles using shadows



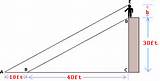
2: Two touching triangles using a mirror to create congruent angle by reflection (NOT REFLEXIVE PROPERTY)



3: Overlapping triangles created by standing in the path of the immeasurable object’s shadow



4: Overlapping triangles created by standing atop the object.

 \*Can make proportion with triangle sides or with proportional segments

Triangle 1 has angles of measure a, b, and c, and triangle 2 has angles of measure x, y, and z.  
  
The AA triangle similarity theorem says that our triangles have two pairs of matching angles. So let a=x and b=y. To prove the theorem, we need to show that c=z, because that would give us AAA.  
  
Because the sum of the angles of a triangle is 180 degrees, we know that a+b+c = 180, or c = 180 - a- b. Likewise, x+y+z = 180, or z = 180 -x -y. But a=x and b=y, so we substitute in the last equation to get z = 180 -a -b. This is the same as c, so c=z. ONLY PROVES THAT 2 pairs of congruent angles makes a 3rd. What about sides?  
  
Edit: Do you know the law of sines? Let A, B, C, X, Y, Z be the length of the sides opposite angles a, b, c, x, y, z, respectively. We need to show A/X = B/Y = C/Z.  
  
We know sin(a)/A = sin(b)/B = sin(c)/C, and sin(x)/X = sin(y)/Y = sin(z)/Z. Take the second set of equations divided by the first set equation of equations.  
  
sin(x)/X / (sin(a)/A) = sin(y)/Y / (sin(b)/B) = sin(z)/Z / (sin(c)/C). Simplify...  
  
A/X \* sin(x)/sin(a) = B/Y \* sin(y)/sin(b) = C/Z \* sin(z)/sin(c). But remember a=x, b=y, and c=z, so all of the sin terms cancel, leaving A/X = B/Y = C/Z.