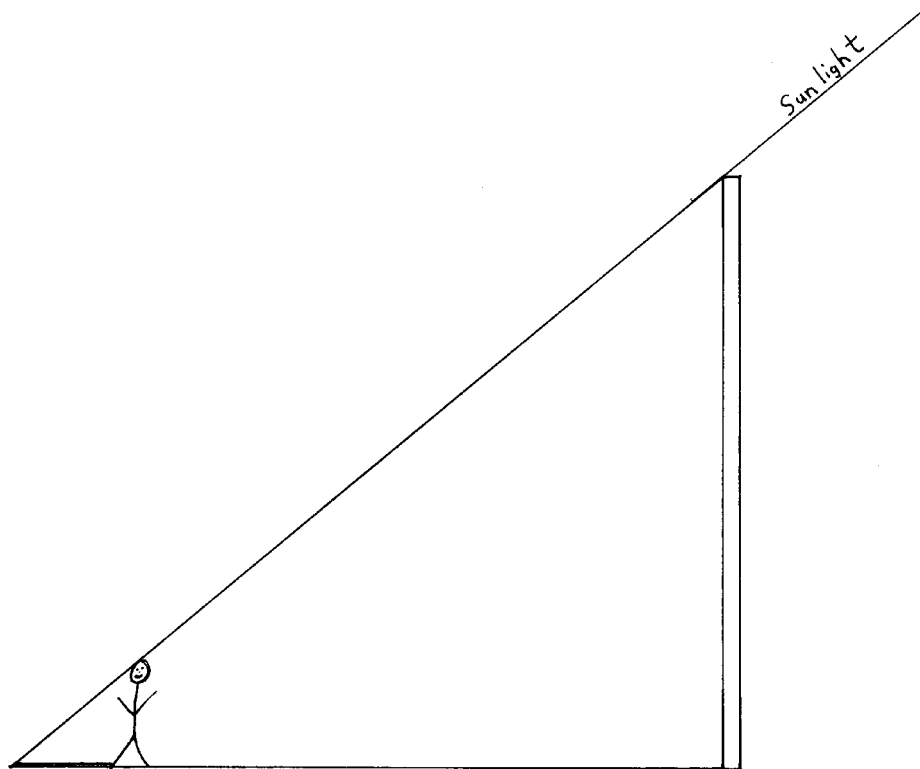


STAMPEDE

Using Shadows as Measuring Tools

1. Finding the height of a light pole using similar right triangles
 - Find the height of a person in your group or the length of some other object.
 - Once you're outside measure the length of the shadow of the person or other object.
 - Measure the shadow length of the light pole.
 - Using similar triangles, find the height of the light pole

$$\frac{\text{Shadow length of person}}{\text{Shadow length of pole}} = \frac{\text{Person's height}}{\text{Pole height}}$$



2. Similar triangles

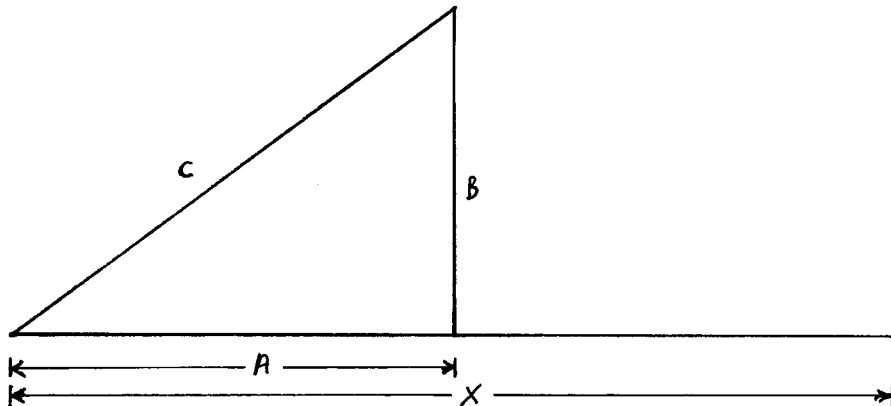
- What are similar triangles
 - Triangles that are the same shape but different sizes
 - The relative sides are proportional to each other
- Constructing similar triangles
 - On the sheet that has one right triangle already drawn, complete the second right triangle so it has the same shape as the first. Make sure the two lines you draw are long enough to intersect each other. Label the sides of the new triangle X, Y, and Z, such that X corresponds with A, Y with B, and Z with C.
- Proportions
 - Measure the sides of both triangles and record the measurements in the data table.
 - Find and compare the following ratios:

$$\frac{A}{X}; \quad \frac{B}{Y}; \quad \frac{C}{Z}$$

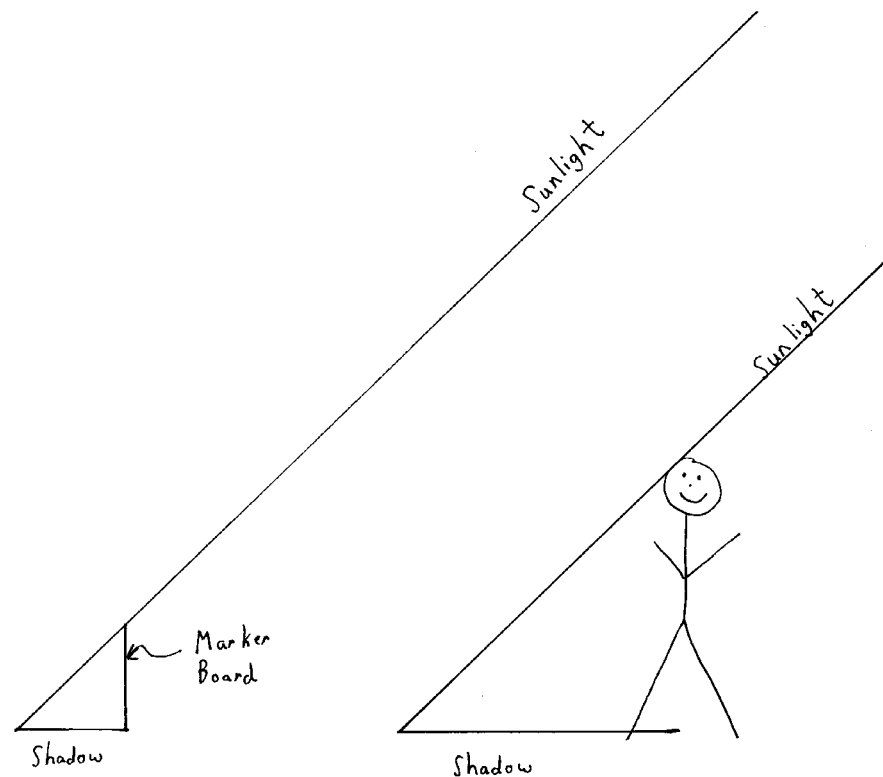
- How do the ratios compare?

Similar Triangles

Data Table	
Side	Length
A	
B	
C	
X	
Y	
Z	



3. Convincing yourself that the similar triangle method works



- Outside
 - Place your marker board on its end and measure the length of its shadow.
 - Measure the shadow length of a member of your group.
- Inside
 - Place your marker board on its end and measure its height.
 - Using the method of similar triangles find the person's height.

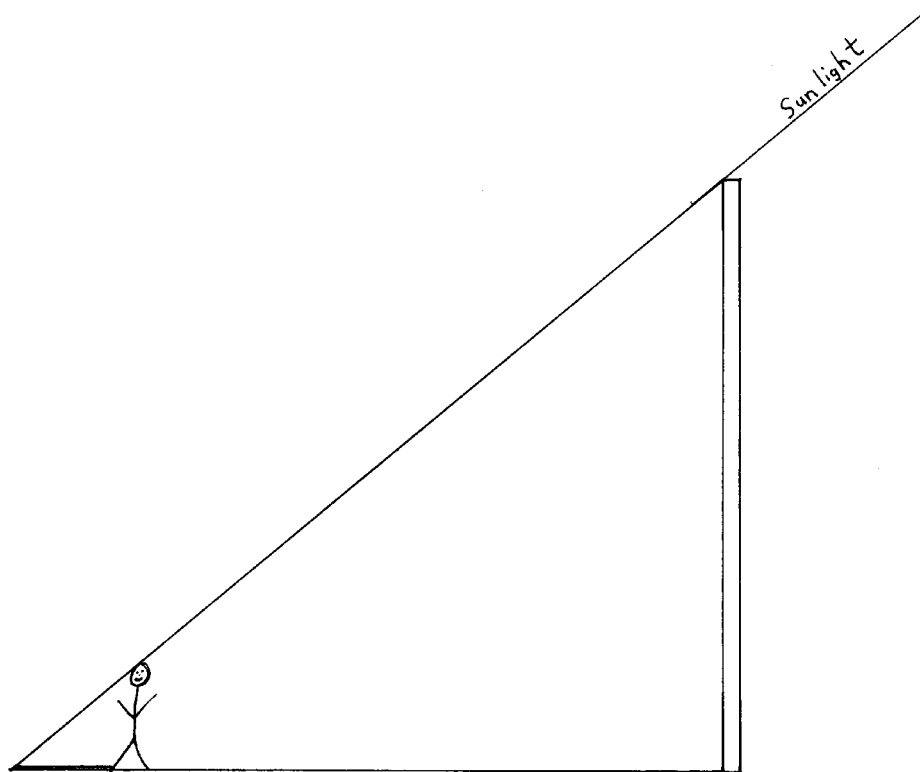
$$\frac{\text{Shadow length of person}}{\text{Shadow length of board}} = \frac{\text{Person's height}}{\text{Board height}}$$

- How close did you come to the person's actual height?
- What were the problems you encountered / What were possible errors.

4. Measuring the height of the lamp pole

- Find the height of a person in your group or the length of some other object.
- Once you're outside measure the length of the shadow of the person or other object.
- Measure the shadow length of the light pole.
- Using similar triangles, find the height of the light pole

$$\frac{\text{Shadow length of person}}{\text{Shadow length of pole}} = \frac{\text{Person's height}}{\text{Pole height}}$$



Similar Triangles

Data Table	
Side	Length
A	
B	
C	
X	
Y	
Z	