

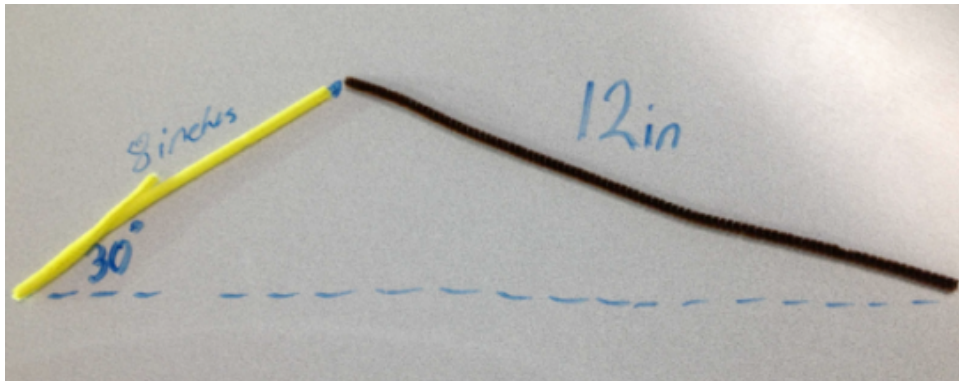
BIG PICTURE of this Unit

- How can we extend our geometry skills with triangles to go beyond right triangles to (i) obtuse triangles and (ii) circles and Cartesian Planes?
- What do triangles have to do with sinusoidal functions in the first place?
- How can we connect previously learned function concepts and skills to sinusoidal functions?
- How can use the equation of a sinusoidal function be used to analyze for key features of a graph of a sinusoidal curve?
- When and how can triangles and sinusoidal functions be used to model real world scenarios?

LAB Exercise #1 – The Ambiguous Case (SSA triangles) {8,9,10}

Objective: Use the pipe cleaners to create as many triangles as possible.

1. Draw an extended baseline that is at least 24 inches in length and label **one end** as point A. Do **not** label a second end point. **Part of this side** will become side AC of a triangle.
2. Use one pipe cleaner that is 8 inches long and place one end at point A. You have now created side AB of a triangle (where point B is at the end of this pipe cleaner).
3. Measure the angle at A such that it is exactly 30° .
4. Side BC is a second pipe cleaner (darker color) and it will be 12 inches long.
5. Now record the measure of each side and each angle and record these measurements in a diagram of this triangle you have created, $\triangle ABC$. (see diagram)



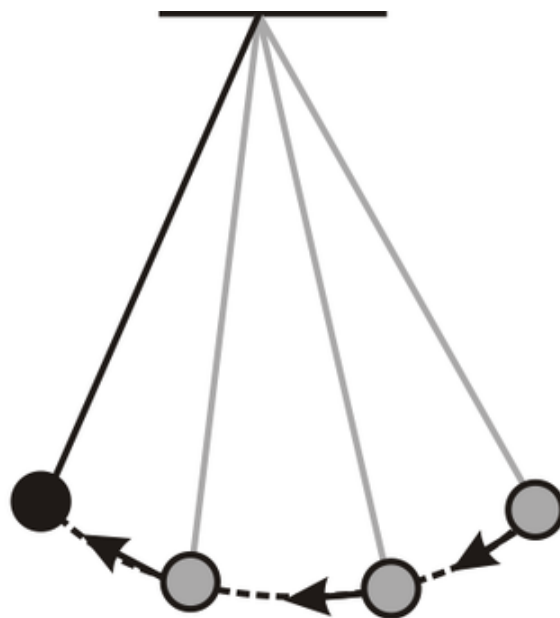
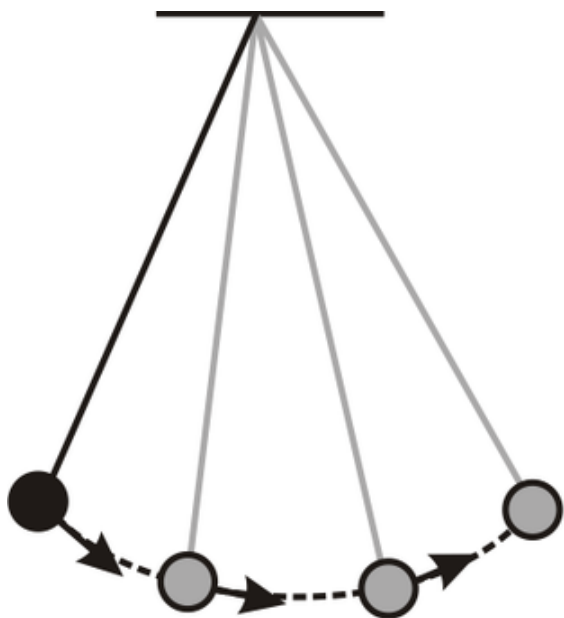
6. To create other triangles, keep side AB as 8 inches and keep angle A as 30° . Now side BC can be shortened by 1 inch increments, so it will now be 11 inches. Once again, record the measure of each side and each angle and record these measurements in a diagram of this triangle you have created, $\triangle ABC$.
7. Continue creating triangles by shortening side BC by 1 inch increments. Record all triangles you constructed by drawing diagrams.

LAB Exercise #2 {17,18,19}

Pendulum Lab

TASK: To create a data set of time (independent variable) and position (dependent variable), one that you will plot on a graph and one from which you will ultimately write a sinusoidal equation

You will construct a pendulum from the materials provided. You will also need to record some initial conditions from your experimental set up. Write up your experimental procedure and initial measurements, get it approved by me and then run the experiment to collect your data.



LAB Exercise #3 {17,18,19}

Hooke's Law Lab

TASK: To create a data set of time (independent variable) and position (dependent variable), one that you will plot on a graph and one from which you will ultimately write a sinusoidal equation

You will construct a pendulum from the materials provided. You will also need to record some initial conditions from your experimental set up. Write up your experimental procedure and initial measurements, get it approved by me and then run the experiment to collect your data.

