Mathematical Modeling of Waves with Desmos

1. Go to **Desmos** (www.desmos.com) and Launch Calculator. Sign in with your Google account.
2. In the expression field on the left side of the Desmos window, type in the expression

   A•sin(B•x + C)

   You may need to use the pop-up keyboard for the multiply sign.
3. Add sliders for A, B and C.

   NOTE: You have just told Desmos to plot **y = A•sin(B•x + C).**
4. **A**, **B** and **C** are constants in the equation. Because we have told Desmos to make these into sliders, we are easily able to change their values. Use the sliders to determine what **A**, **B** and **C** represent. Report below:

   A represents: _____

   B represents: _____

   C represents: _____
5. Save your graph with a memorable name. We will use the graph again at a later time.

We will describe waves by five mathematical properties. These properties are amplitude, wavelength, period, frequency, and speed. You need to know their meaning.

Amplitude (**A**)	Maximum amount of displacement of a particle from rest Unit: meter (m), cm, feet	How high?
Wavelength (**λ**)	The length of the repeating pattern within the medium Unit: meter (m), cm, feet	How long?
Frequency (**f**)	The number of complete vibrational cycles per time Unit: Hertz (Hz), cycles/second, waves/second	How often?
Period (**T**)	The time for a particle to complete one vibrational cycle Unit: second (s), seconds/cycle, seconds/wave	How much time?
Speed (**v**)	The distance traveled per period of time Unit: meter/second (m/s), cm/s, ft/s, mi/hr, km/hr	How fast?