

## Period, Amplitude and Shift

This worksheet is accompanied with the Geogebra file found at the following link.

Follow the instruction given and try the investigations.

Explore the role of 'a' by changing the value of a using the slider a. Note the changes in the graph of

$$y = 2 \sin x$$

$$y = 3 \sin x$$

$$y = 4 \sin x$$

$$y = -1 \sin x$$

$$y = -2 \sin x$$

comparing with the basic function's graph (given in dotted red line graph).

What effect does "a" have on the basic sine function?

Use the definitions given and write your conclusion below.

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Next explore the role of "b" by changing the respective slider while keeping the slider a at 1.

$$y = \sin 2x$$

$$y = \sin 3x$$

Note the changes in the graph of  $y = \sin \frac{1}{2}x$

$$y = \sin \frac{1}{4}x$$

$$y = -2x$$

What effect does "b" have on the basic sine function?

Using the definition of period, write your conclusion below.

When  $1 \leq b \leq \infty$

When  $0 \leq b \leq 1$

And when  $b < 0$

In a similar way, explore the role of “c”, keeping the slider a and b at 1.

$$y = \sin x + 2$$

$$y = \sin x + 3$$

Note the changes in the graph of  $y = \sin x - 2$

$$y = \sin x - \frac{1}{2}$$

Comment on the changes in the graph

When c is positive

When c is Negative

What do you notice in the graph by changing the values of d?

$$y = a \cos(bx + c) + d$$

Comment on the changes in the graph of *and*

$$y = a \tan x(bx + c) + d$$