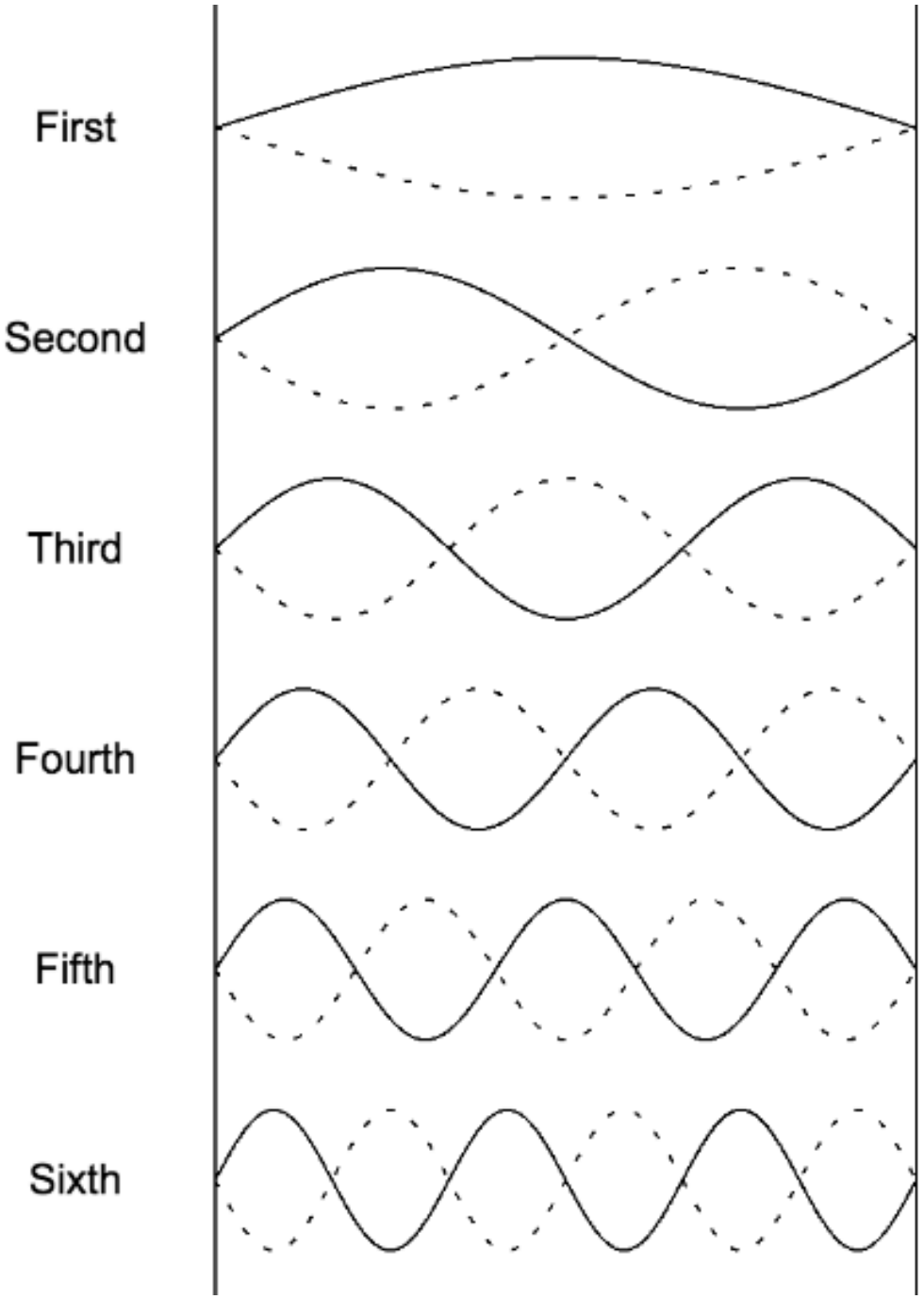
HARMONICS

Name _____

Harmonics:
Standing waves come in shapes called *harmonics*.

This page shows the first *six* harmonics. They are called the *first* harmonic, the *second*, harmonic, the *third* harmonic, etc.

On each harmonic, label each of the *nodes* with a dot. Count the two ends as nodes. Label each of the *antinodes* with a cross.



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How many *nodes* and *antinodes* does each harmonic have?
[note: The first harmonic has only *one* antinode. The second harmonic has *two* antinodes.]

Harmonic	Number of Nodes	Number of Antinodes		Harmonic	Number of Nodes	Number of Antinodes
First				Fifth		
Second				Sixth		
Third				Seventh		
Fourth				Eight		

Explain the pattern for how many *nodes* each harmonic has:

Explain the pattern for how many *antinodes* each harmonic has:

Extra formula practice!
If a wave has a wavelength of 0.5 meters and a frequency of 600 Hz, what is its speed?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

If a wave has a wavelength of 0.4 meters and a speed of 8.3 meters, what is its frequency?

Looking For	Formula	
Already Know		

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Drawing your own harmonics:
It takes *practice* to learn to draw harmonics well. These are things you want to make sure you do well:
1. All your harmonics should be *the same length*. This allows you to see how more harmonics are squeezed into each space.
2. try to make each wavelength the same distance.

Practice drawing the *first seven harmonics*. You can use the previous page to help you figure out how to draw them.

Harmonic	Drawing
First	
Second	
Third	
Fourth	
Fifth	
Six	
Seven	