

CHEMISTRY “WAVE ANATOMY” LAB

~Use your own paper~

WHAT TO TURN IN: Hypothesis Questions # 1 – 8 Wave Drawings # 1 – 5

OBJECTIVES

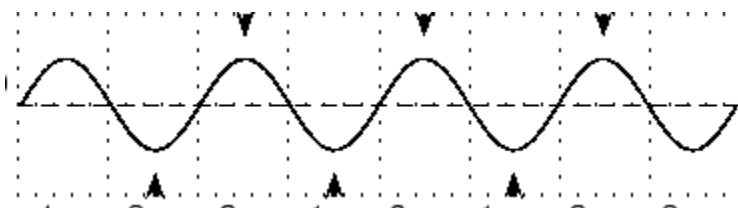
- To review the role of waves in everyday life.
- To review the parts of a simple wave.
- To practice drawing sample waves.

BACKGROUND INFORMATION

To fully understand how waves move and affect their surroundings, you should be familiar with the parts of a wave. Waves can change their shapes and dimensions. Review the parts of a wave as diagramed below.

Waves move in cycles. A *wave cycle* is one crest and one trough. The *frequency* of a wave is its speed—the rate of *cycles per second* during travel. The units for frequency are *cps*, *sec⁻¹* or *Hertz (Hz)*.

Moving waves have energy. A wave with *high energy* is very tall (high amplitude and wave height) and/or very pushed together (low wavelength). *Low-energy* waves appear to be stretched out, because they have a longer wavelength.



Review the following terms:

CREST	WAVELENGTH
TROUGH	FREQUENCY
WAVE HEIGHT	CYCLES
AMPLITUDE	ENERGY
ORIGIN; ZERO LINE; BASE LINE	

HYPOTHESIS

Write an “if-then” statement about the drawing of waves. Be creative, be specific.

QUESTIONS (before doing the drawings)

- 1) Give a simple definition for a wave.
- 2) Which types of waves can you see with the naked eye?
- 3) How are wavelength and frequency related?
- 4) How are wavelength and energy related?

Think back on what you have learned about types of waves in the past.

- 5) How do waves relate to earthquakes?
- 6) How do waves relate to ocean environments?
- 7) How do waves relate to the sun?
- 8) How do waves relate to sound?

PROCEDURE HINTS

- Follow all directions carefully.
- Use pencil!
- Use plain paper.
- Use a ruler, and **label all numerical measurements and parts of the waves.**
- Longer base lines require drawing the waves sideways to make more room to draw.

PROCEDURE

- 1) Draw the zero line on your paper.
- 2) Amplitude:
 - a. Measure the amplitude above the zero line, and draw a dashed line at the top boundary. The wave will not go higher than this line.
 - b. Measure the amplitude below the zero line, and draw a dashed line at the bottom boundary. The wave will not go lower than this line.
- 3) Wavelength:
 - a. Sketch a crest rising from the zero line, and make a pencil mark on top of the crest, in the middle of the “hump.”
 - b. Measure the wavelength from the pencil mark and make another pencil mark to the right.
 - c. Draw another crest so that the middle of the hump is where your second pencil mark is.
 - d. Fill in the troughs so that the wavelengths are accurate.

WAVES TO DRAW

- 1) WAVE 1: amplitude = 4 cm
 two crests, two troughs (2 complete wave cycles)
 wavelength = 9 cm
 zero line = 20 cm
- 2) WAVE 2: amplitude = 6 cm
 4 complete wave cycles
 wavelength = 3 cm
 zero line = unspecified (at least as long as the wave is)
- 3) WAVE 3: amplitude = 5 cm
 8.5 wave cycles
 wavelength = 2 cm
 zero line = unspecified (at least as long as the wave is)
- 4) WAVE 4: amplitude = 3 cm
 4.5 wave cycles
 wavelength = 2 cm
 zero line = unspecified (at least as long as the wave is)
- 5) WAVE 5: amplitude = 1.5 cm
 5 complete wave cycles
 wavelength = 3.5 cm
 zero line = unspecified (at least as long as the wave is)