Station 1: Hearing

"Write responses in your notebook.

1. Hank had damage to the shorter hairs in his cochlea. How will this affect his hearing? Will he be able to hear at all? What kinds sound will he have difficulty hearing?
2. Jimbo damaged his eardrum. Is a cochlear implant the correct treatment? Why or why not?"

Station 3: Practice calculations

3. A 680 Hz sound wave travels at 340 m/s in air.
   a. What is the frequency?
   b. What is the velocity?
   c. What is its wavelength?
4. An oceanic depth-sounding ship surveys the ocean bottom with ultrasonic sound that travels at 1530 m/s in sea water. They find a 20 s delay of the echo to the ocean floor and back. What is the depth?
5. For the same scenario as 2, how much of a delay will there be when the ocean is only 3060 m deep?
6. A sky scraper swings at a frequency of 0.2 Hz. How long does it take to sway back and forth one time? What are you trying to find in this problem?
7. The crests on a long surface water wave are 20 m apart, and in 1 minute 10 crests pass by. What is the speed of the wave?
8. If the moon blew up, why wouldn't we hear it?
9. How does the electromotive brain transducer 3000 use resonance?

Station 4: Patterns

$T = \frac{1}{f}$ $\quad v = v \quad$ $\lambda = \frac{v}{f}$ $\quad v = f\lambda$

Select the correct pattern from above and draw a graph showing the following relationships:

10. Shaking a slinky at different frequencies, measuring wavelength.
11. Shaking a single slinky at different frequencies, measuring wave speed.
12. Shaking multiple slinkies at the same frequency, measuring velocity and wavelength.
13. Shaking a slinky at different frequencies, measuring period."

Station 5: Light

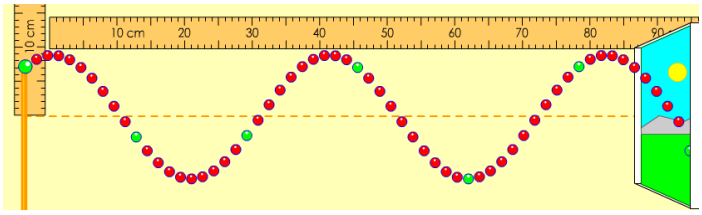
Record your answers to the following in your notes:

14. What does a spectrometer show you when you use it to look at a light source?
15. Describe one way that we know light must be a wave.
16. Describe one way that we know light must be a particle.
17. How is it that one article on light stated that light cannot be a particle and a wave at the same time and another article stated that they had taken a picture of light acting as a wave and a particle at the same time?

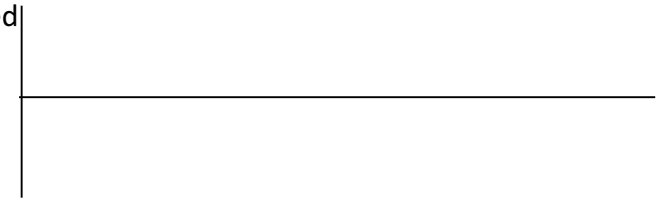
Station 2: ACT problem

Station 6: Waves property practice

18. Label the wave to the right with these terms: wavelength, amplitude, crest, trough.



19. Sketch what the wave would look like if it oscillated twice as fast.



20. How could you make the wave travel faster?

21. As shown in the diagram to the right, a transverse wave is moving with velocity v along a rope. In which direction will the segment marked with an X move as the wave passes through it?