

# Wk31 Waves Intro

## D3: Speed of a Wave

name: \_\_\_\_\_

1. When you increase the frequency by sending more waves per second, the speed of the wave doesn't increase - why not?

2. What is it that controls the speed of a wave?

3. From the list of speeds of sound, answer the following questions:

a) Of solids, liquids and gases, where does sound travel fastest? Why?

b) For liquids and gases, does sound travel faster in colder or warmer conditions? Why?

c) Why doesn't temperature make much difference for solids?

| MEDIUM            | SPEED OF SOUND |
|-------------------|----------------|
| Air, 0 C          | 331 m/s        |
| Air, 20 C         | 343 m/s        |
| Hydrogen, 0 C     | 1286 m/s       |
| Water, 0 C        | 1402 m/s       |
| Water 20 C        | 1482 m/s       |
| Copper (any temp) | 3560 m/s       |
| Iron (any temp)   | 5130 m/s       |

4 In air, sound travels at roughly 1000 ft/sec. You see the lightning, then you hear the thunder 5 seconds later. How far away was the lightning strike?

5. Sound in air travels at about 1,000 ft/sec. You are in a canyon and yell; you hear an echo 2 seconds later. How far away is the canyon wall?

5. In air, sound travels at roughly 1 ft/millisecond. If the teacher speaks at the front of the room, how long before you hear it in the back of the room? (School rooms are generally about 30 ft long.)

6. What medium is required for light? How do we know?

7. How long does it take the sun's light to get to Earth?

8. Why do we say that looking into the night sky is looking into the distant past?

9. Why is it unlikely that aliens have ever visited the Earth?