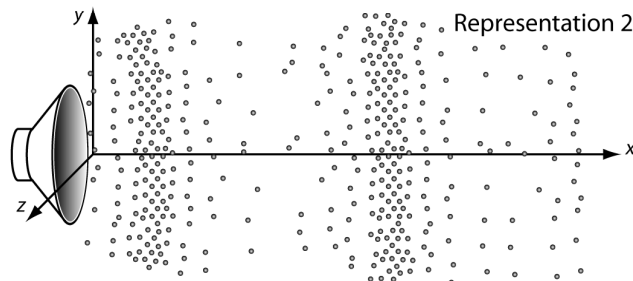
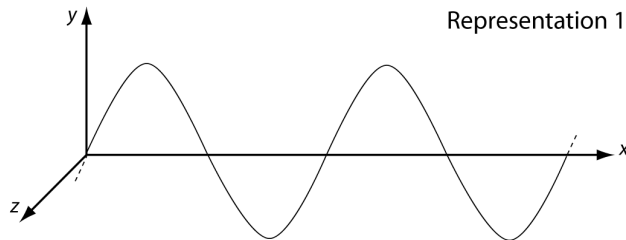


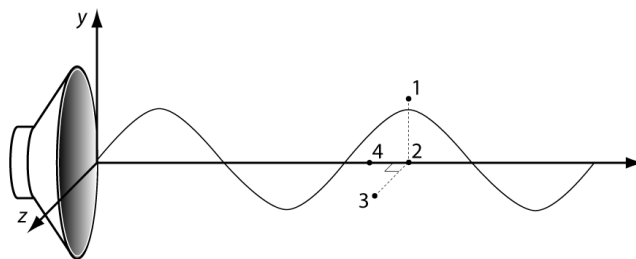
The diagrams to the right show a sound wave at one instant in time. Representation 1 uses a *sinewave* to represent a sound wave at this instant. Representation 2 shows the arrangement of air particles at this instant. **Note both diagrams are drawn to the same scale.**



1. Consider the following four analogies for a sound wave:
  - a. A crowd in a stadium doing “the wave”.
  - b. A wave on a string.
  - c. A long row of people passing footballs from person to person.
  - d. A wave made with a stretched slinky.
  - e. Something else.

Which analogy or analogies (you may use more than one) seem the best for describing a sound wave? Explain your reasoning. Note there is no “correct answer” – it is up to your interpretation.

2. The diagram on the right shows four points (labeled 1-4) in space in front of a speaker. The points are separated by a small distance (less than the size of the speaker.) Points 1, 2, and 4 lie in the x-y plane. Point 3 has the same x-coordinate as 1 and 2, but lies out of the page (in the z-direction).

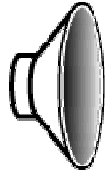


Which of the following is the best ranking of magnitude of the *pressure* at the four points? **Note the pressure is proportional to the *density* of the air particles.**

- a.  $1 > 2 = 4 > 3$
- b.  $1 = 2 = 3 > 4$
- c.  $4 > 1 = 2 = 3$
- d.  $1 = 2 = 4 > 3$
- e.  $1 = 2 > 4 > 3$
- f.  $1 = 2 > 4 = 3$

3. In the diagram on the right, a dust particle sits directly in front of a speaker. The speaker plays a sound of constant frequency. Which choice below best describes the motion of the dust particle?

Speaker



Dust Particle



- a. Oscillating up and down
- b. Moving to the right away from the speaker
- c. Oscillating left and right
- d. The dust particle will not move
- e. None of the above