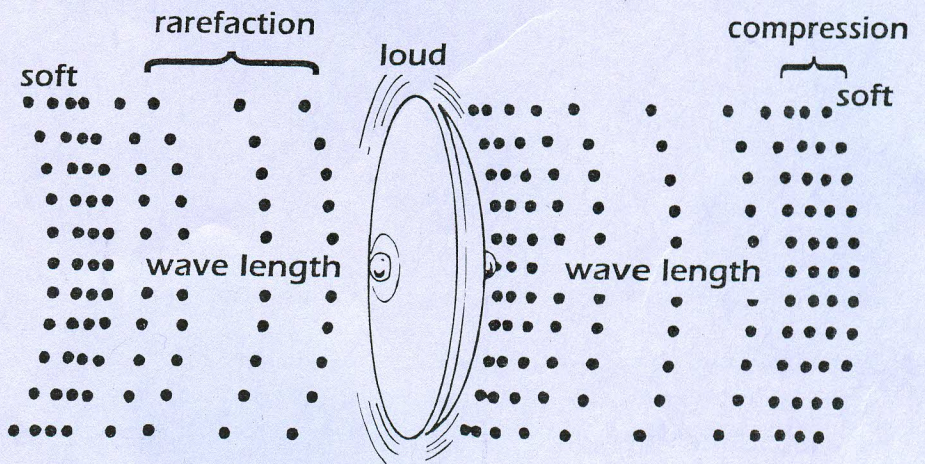


# HOW A SOUND WAVE TRAVELS

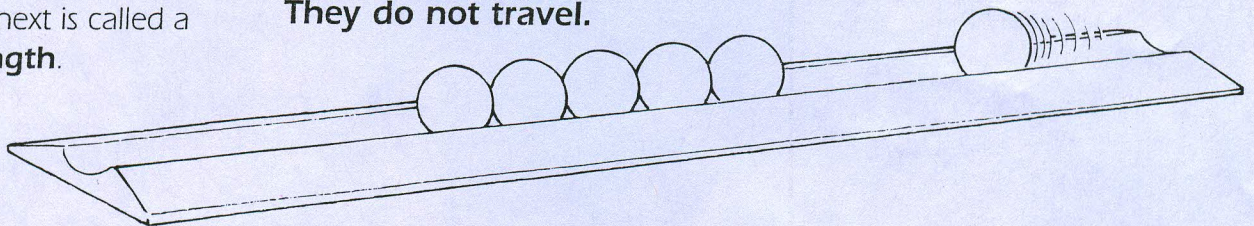
Vibration produces sound. When an object vibrates it moves back and forth. As it moves forward, it causes the air molecules near it to move away. These molecules bunch up with the next molecules to form a **compression**. When the object moves back, it leaves extra space for the molecules to spread out, forming a **rarefaction**. The distance between one compression (or rarefaction) and the next is called a **wavelength**.

Sound travels in waves.

Only the wave travels.



Individual molecules vibrate back and forth. They do not travel.



## ACTIVITY

Place 5 marbles along the groove of a 12-inch ruler as shown. Now take a sixth marble and flick it against the end of the row. What happens?

---



---

The energy of the first moving marble is transferred through the other marbles to the last one. In this way, the **energy wave** travels in one direction, but the individual marbles do not.

As the wave travels, some energy is lost with each molecular compression and eventually no energy is left. That is why sounds are louder when you are closer to the source.

Molecules that are already close together are easier to compress than ones that are far apart. Therefore, since sound waves depend on compression, sound travels faster in a denser medium.

