

# Do Now: (LEFT SIDE Title Properties of Matter)

Some properties of matter depend on how much matter there is. Copy into your notebook all of the statements you think are true about properties of matter.

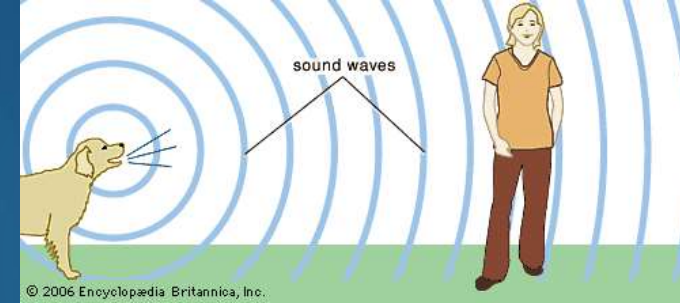
- ▶ The more you have of a substance, the greater its density is.
- ▶ The more you have of a substance, the greater its volume is.
- ▶ The more you have of a substance, the higher the temperature needed to reach its boiling point.
- ▶ The more you have of a substance, the greater its mass is.
- ▶ The more you have of a substance, the lower the temperature needed to freeze it.
- ▶ The more you have of a substance, the less its electrical conductivity.

**Explain your thinking. What rule or reasoning did you use to decide whether the amount of matter made a difference in its properties?**

# Properties of Matter:

Organization of Atoms

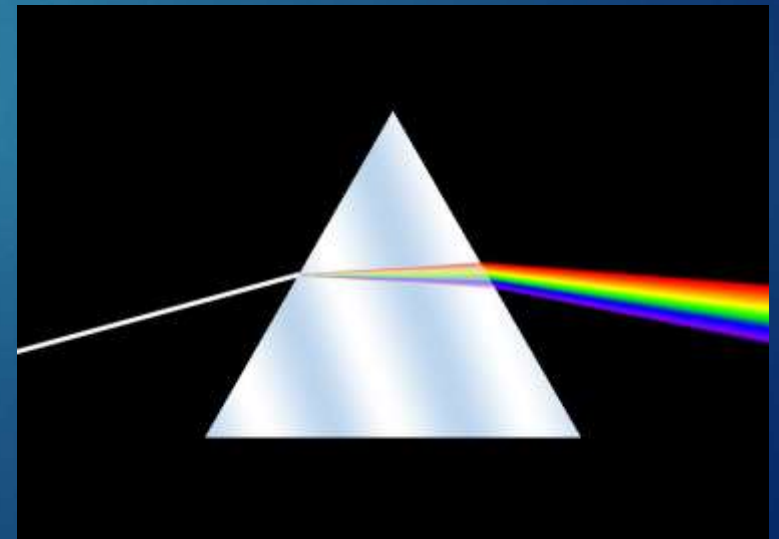
**SC.7.P.10.3** - Recognize that light waves, sound waves, and other waves move at different speeds in different materials.



**ALSO ASSESSES: SC.7.P.10.2** OBSERVE AND EXPLAIN THAT LIGHT CAN BE REFLECTED, REFRACTED, AND/OR ABSORBED.

**Essential Question:**

How are light and sound waves affected by the different media they travel through?



# States of Matter



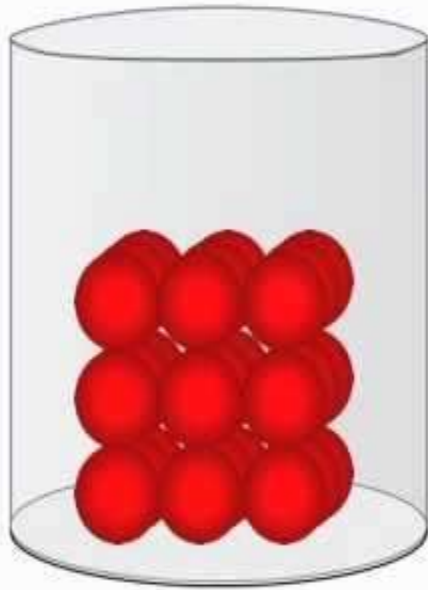
Matter: anything that has mass and volume

- ▶ Solid: does not change shape or volume, molecules compact
- ▶ Liquid: takes shape of container, volume does not change, molecules more spaced out and free flowing
- ▶ Gas: takes shape and volume of its container, most space between molecules
- ▶ Plasma: matter heated so high that atoms begin to ionize and break apart

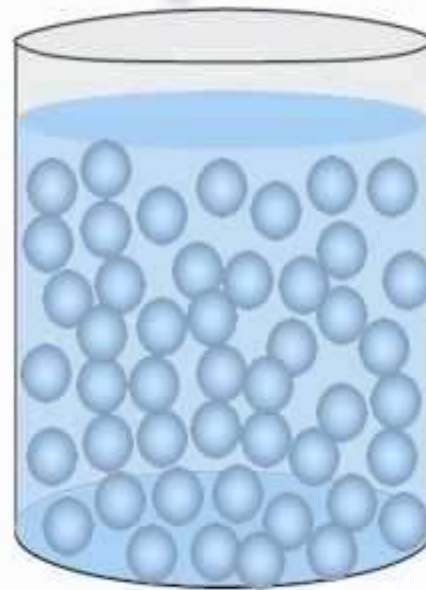
# 3 Media: Solids, Liquids, and Gases

Sketch the molecular arrangement.

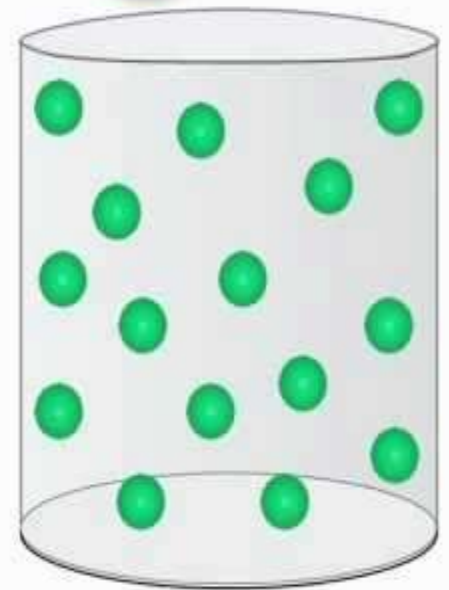
**solid**



**liquid**



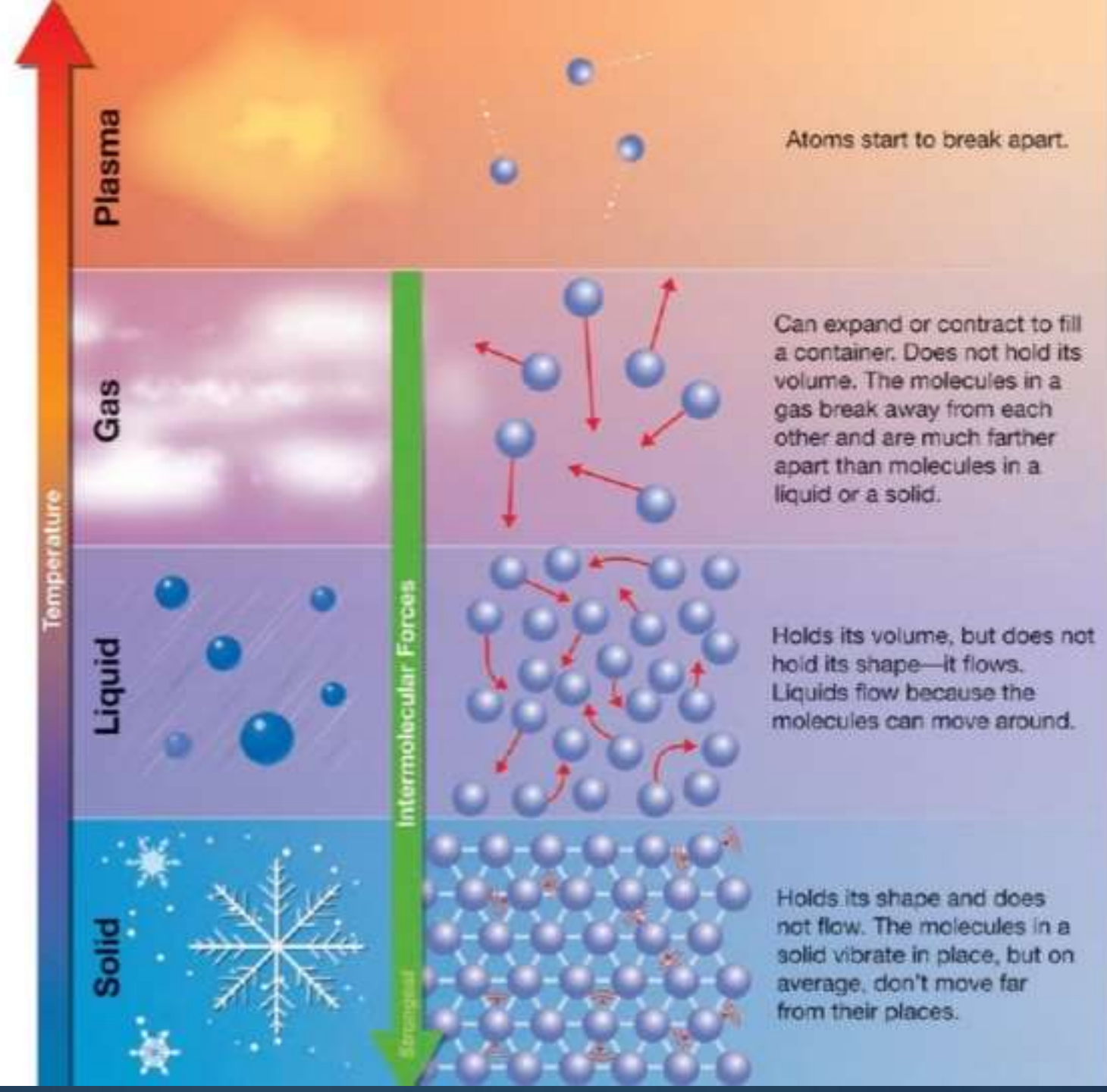
**gas**



- ▶ Arrangement of atoms affects how waves can pass through matter

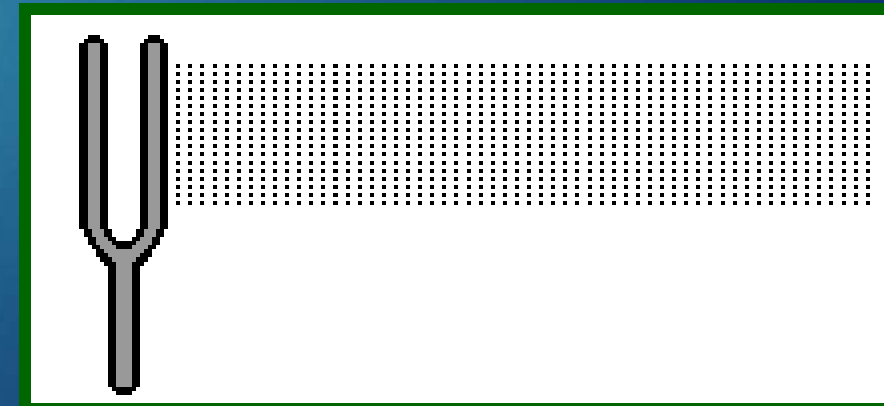
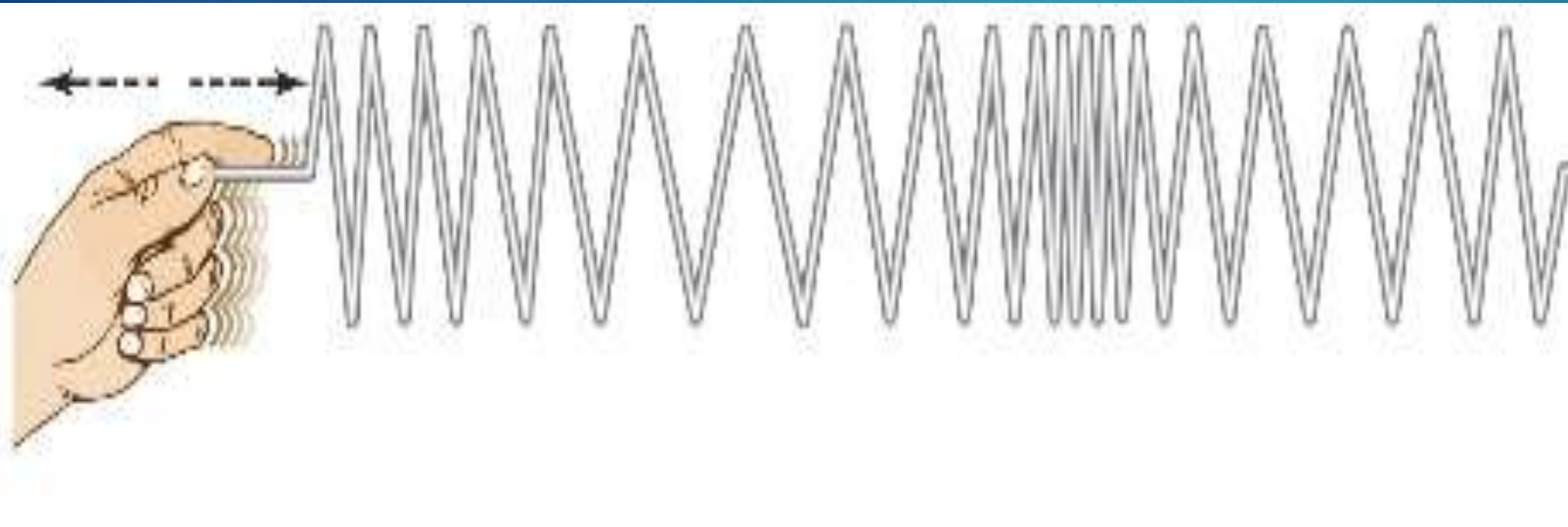
# Intermolecular Forces

- ▶ When they are close together, molecules are attracted through intermolecular forces.
- ▶ Intermolecular forces have different strengths in compounds.
  - ▶ Iron is solid at room temp. & water is liquid at room temp – this tells you IM forces between Iron are stronger than between water molecules.
- ▶ In all matter is a constant competition between temperature and Intermolecular forces.



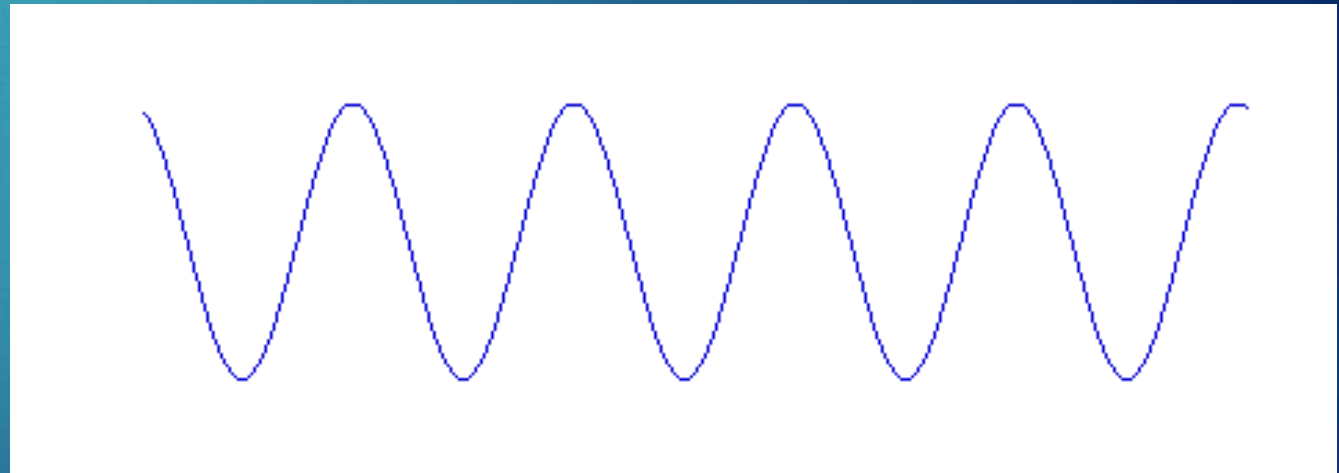
# LONGITUDINAL WAVES

- ▶ A SOUND wave that forms by the compression of molecules as it travels through a medium.
- ▶ Sound causes compression waves from side to side in matter.
- ▶ The closer the molecules, the faster sound can travel.



# TRANSVERSE WAVES

- ▶ A light wave travels as Electromagnetic Radiation
- ▶ Light travels the fastest when there is no matter in the way.
- ▶ Light will change speed as it moves from one medium to another.





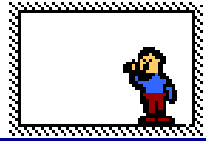
# REFLECTION

Reflection is when a light wave bounces off a surface and changes its direction.

Reflected sound are called echoes.

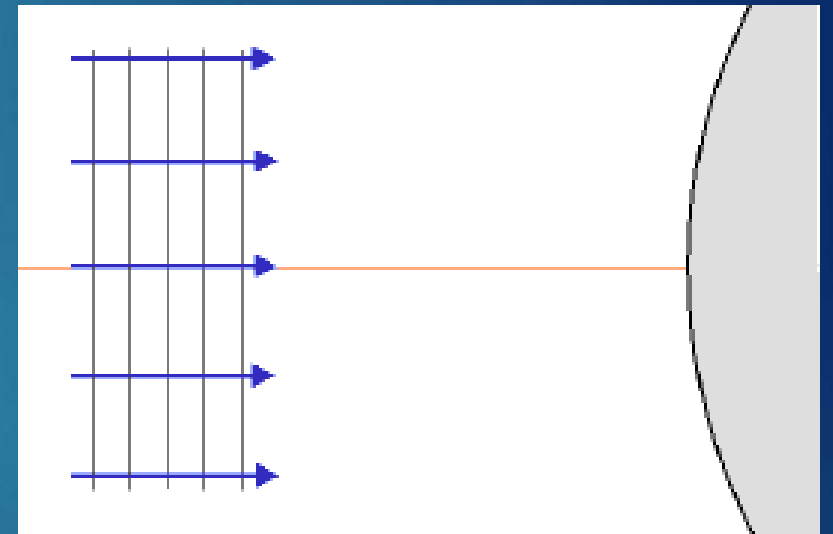


**Reflection off a Nearby Wall**



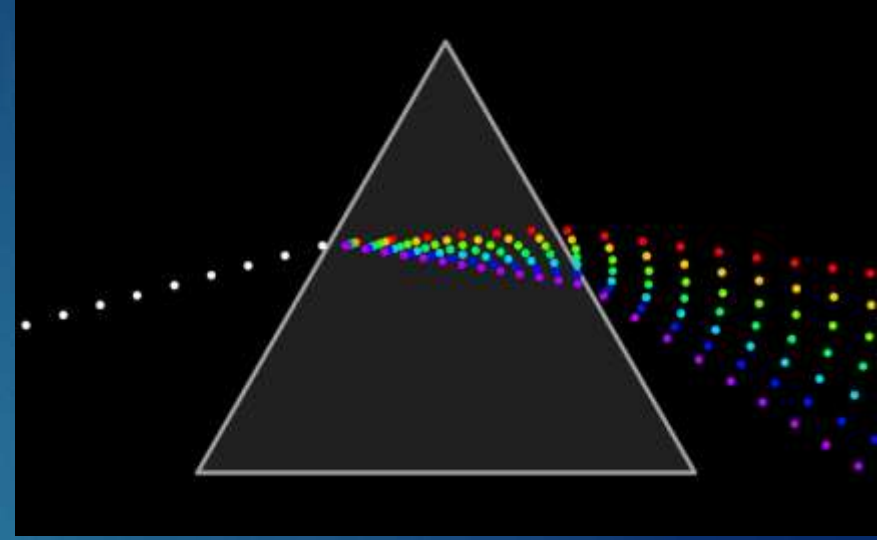
**Time (s): 0.00**

**Reflection off a Distant Cliff**



# REFRACTED

**Refraction** – When light passes from one form of matter to another, it changes speed. Therefore, the image you see will be distorted.



# ABSORPTION

- ▶ When light hits a surface, some of it is absorbed, or taken in.
- ▶ When light is absorbed, it is transformed from light energy to heat energy.



