

# Multiple Causes

When we look for what causes something, we tend to look for the cause. We assume that there is just one cause. Sometimes there is, but often there is more than one cause. There are multiple causes.

**Causes can work together to make something happen.**

## How do multiple causes work?

There three ways multiple causes work:

1. All causes are necessary: Causes work together so that every time a certain thing happens, you need all of the causes to make the event happen. In other words, if there were three causes, all three are necessary to make something happen. For example:

Someone nominated Talia; \_\_\_\_\_ →  
(and) someone seconded the nomination; \_\_\_\_\_ → Talia is voted  
(and) the majority of the class voted for Talia. \_\_\_\_\_ → class president.

2. Some causes are necessary: Causes work so that at least one out of a set of possible causes is needed to make a certain thing happen. Any one of the three causes are sufficient to make it happen. For example:

Meghan's father is sick;  
(or) Meghan's best friend is moving; \_\_\_\_\_ → Meghan is sad.  
(or) Meghan's cat died.

3. Different combinations of causes are necessary: Causes work in different combinations so that two of three **possible** causes work together. For example:

A kid at school started a rumor about Tim;  
(and/or) his best friend didn't tell Tim about the rumor; \_\_\_\_\_ → Tim is really  
(and/or) Rob took Tim's favorite pen. \_\_\_\_\_ → mad.

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## What has this got to do with density?

Density has multiple possible causes.

Differences in density are caused by:

- **Atomic Mass:** Different atoms have different masses due to the number of protons and neutrons that the atoms are made up of.
- **Atomic and Molecular Bonds:** The strength and structure of the bonds determines the distance between atoms.
- **Mixed Density:** When there are two or more materials or substances that make up the object or substance, it is mixed density. For instance, when gas molecules are spread out with other molecules in between them, or when something is hollow inside and is a combination of air and the material around the outside, mixed density applies.

The three causes of density work in different ways to explain different cases, so that sometimes just one cause leads to the outcome of density, sometimes two of three **possible** causes work together, and sometimes all three work together. For example:

