



1.4 Recognizing Patterns on Graphs

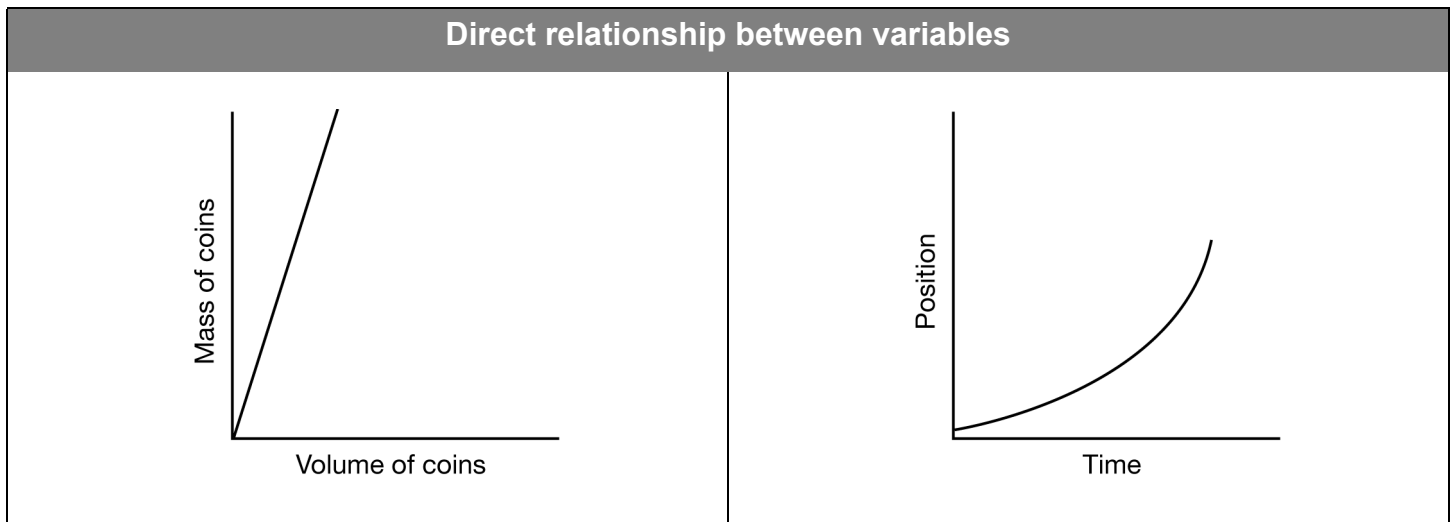
READ

In physical science class, you will do laboratory experiments to answer questions such as: If I change this, what will happen to that? For example, you might ask: If I change the mass of a toy car by adding some cargo, what will happen to its acceleration down a ramp? Or, you might ask: If I change the temperature of some water in a beaker by heating it on a burner, what will happen to the amount of sugar that I can dissolve in it?

Making a scatterplot graph of your results can help you recognize patterns in your data. In order to share your results with others, it is helpful to understand the vocabulary that scientists use to describe patterns seen on scatterplot graphs. In this skill sheet, you will practice describing some of these patterns.

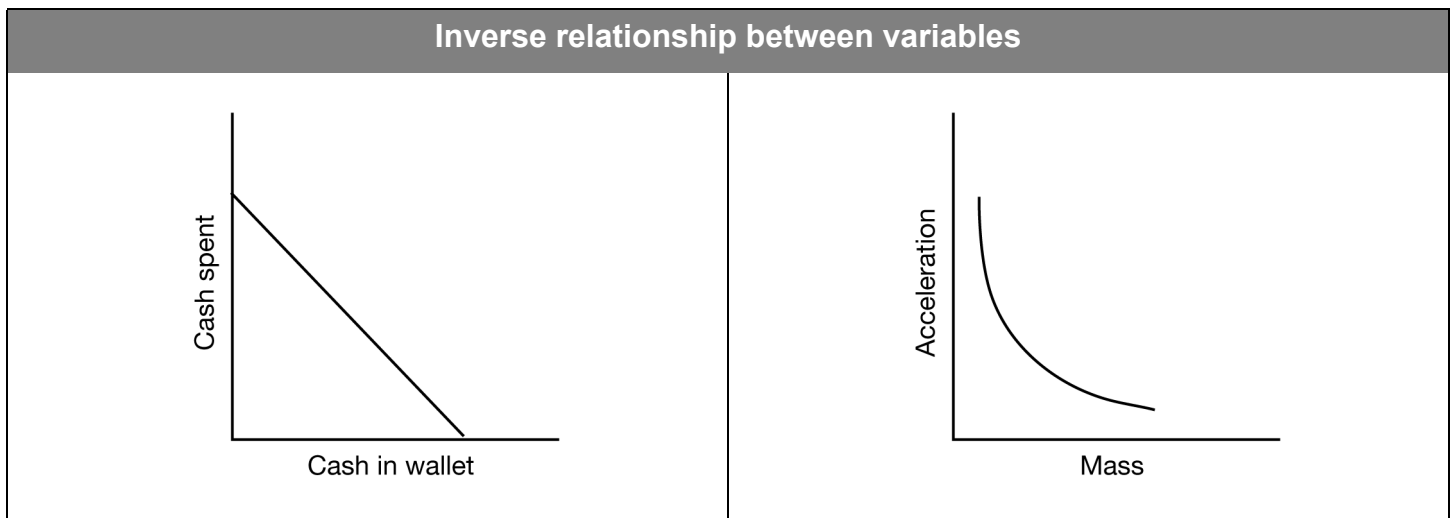
EXAMPLE 

Take a look at these two graphs:



In each case, the line or curve slopes up from left to right. This tells you there is a **direct relationship** between the x - and y -variables. If you increase the x -value, the y -value will also increase.

Here are two more graphs:



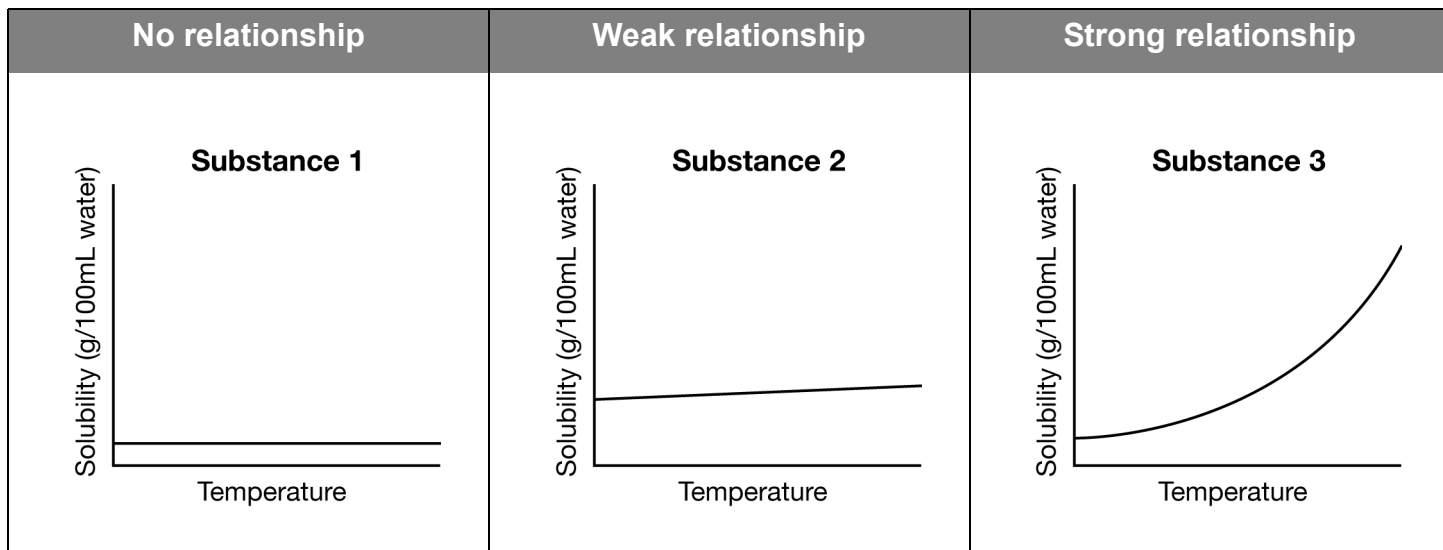


In each case, the line or curve slopes down from left to right. This tells you there is an **inverse relationship** between the x - and y -variables. If you increase the x -value, the y -value will decrease.

Sometimes your graphs will be a straight line. This tells you there is a **linear relationship** between variables.

If the graph is a curve, we say that the relationship is **non-linear**.

Scatterplots can also help us describe the strength of the relationship between two variables. The following graphs show the number of grams of three different substances that will dissolve in 100 ml of water at different temperatures.



Substance A: The amount that will dissolve is not related to temperature. No relationship.

Substance B: The amount that will dissolve increases slightly with temperature. This is a weak relationship.

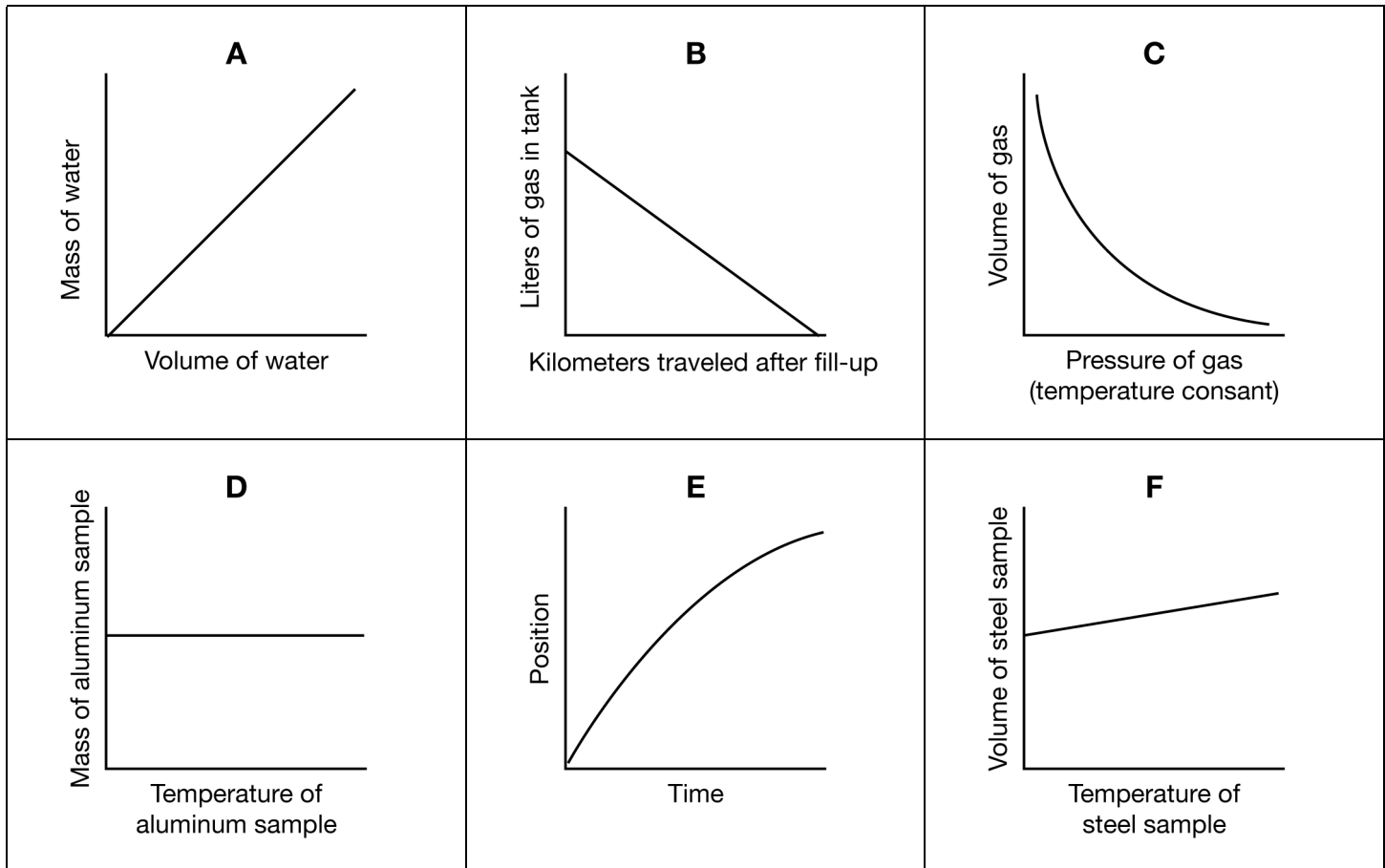
Substance C: The amount that will dissolve increases a lot with temperature. This is a strong relationship.



PRACTICE



Answer the following questions about graphs A–F, below.



1. Name three graphs which show a direct relationship between variables.
2. Name two graphs which show an inverse relationship between variables.
3. Name three graphs which show a linear relationship between variables.
4. Name two graphs which show non-linear relationships.
5. In which graph does a change in the x-variable cause NO CHANGE in the y-variable?
6. Which graph shows a stronger relationship between variables, graph A or graph F?