

# Curious = Science

## How to write a hypothesis

Use the following points and questions to guide the development of a good hypothesis:

1. Is the language clear and precise?
2. After reading the hypothesis is the research topic clear?
3. Does the hypothesis clearly identify the independent and dependent variables?
4. Are the variables in 3. above, easy to manipulate or measure?
5. Can the hypothesis be tested by conducting an experiment or investigation?
6. Does the hypothesis clearly explain how a change in the independent variable will change the dependent based on scientific knowledge or observation?
7. Never use terms such as "I", "me", "we", "they", a hypothesis must remain neutral.

### ***Writing the hypothesis as an "if", "then", "because" statement***

A hypothesis written in an "if... then...because" statement clearly informs the reader what will happen to a dependent variable when certain changes are made to the independent variable. The "because" statement gives a reason why the predicted changes are likely to take place.

**Example** – *If iron is exposed to salty water then rusting will occur faster, because we observe that many iron fences by the sea are highly rusted as compared to similar fences in the suburbs.*

- IF... informs on what the independent variable will be and how it is changed. In the example above, the presence of salt in water is the independent variable and the impact of its absence or presence in the water will be tested.
- THEN... informs on what the dependent variable will be and how it changes as a result of the change made to the independent variable. In the example above, the amount of rust produced over a certain period of time is the dependent variable and will be measured.
- BECAUSE... informs on why this prediction was made and is based on scientific knowledge or observation, as in this case where it was observed that similar iron fences by the beach had more rust than similar fences in the suburbs.

Let's see some examples of well written and poorly written hypotheses.

a) If water is present on a piece of bread, then more mould will grow than if the bread was dry, because it was observed that a dry piece of bread left in the pantry for 2 months had no mould growing on it.

- 1) Is the language clear and precise? **Yes, we can see that we are testing for the presence of water and how it impacts on mould growth on bread.**
- 2) After reading the hypothesis is the research topic clear? **Yes we are testing for the impact of water on the rate of mould growth on bread.**
- 3) Does the hypothesis clearly identify the independent and dependent variables?  
**Yes.**  
**independent variable = water**  
**dependent variable = amount of mould**
- 4) Are the variables in 3. above, easy to manipulate or measure? **Yes. It is easy to make one sample moist and keep the other dry while observing the rate of mould growth.**
- 5) Can the hypothesis be tested by conducting an experiment or investigation?  
**Yes, given the we have access to all that is needed we can set up a scientific investigation.**
- 6) Does the hypothesis clearly explain how a change in the independent variable will change the dependent based on scientific knowledge or observation?  
**Yes, presence of water will increase growth of mould.**
- 7) Never use terms such as "I", "me", "we", "they", a hypothesis must remain neutral.  
**Yes, the hypothesis remains neutral.**

b) If a gold fish is happy then it will swim and move about more inside its tank, because I have observed happy dogs in the park running around more than sad dogs.

- 1) Is the language clear and precise? **Yes, we can see that we are measuring the happiness of gold fish to see how it impacts it's movement based on observations made of dogs in the park.**
- 2) After reading the hypothesis is the research topic clear? **Yes, we can see that we are measuring the happiness of gold fish to see how it impacts it's movement based on observations made of dogs in the park.**
- 3) Does the hypothesis clearly identify the independent and dependent variables?  
**Yes.**  
**independent variable = happiness of gold fish**  
**dependent variable = amount of movement**
- 4) Are the variables in 3. above, easy to manipulate or measure? **No. We cannot measure the happiness of gold fish, even though we can measure the movement by measuring the distance covered per unit time.**
- 5) Can the hypothesis be tested by conducting an experiment or investigation?  
**No, we cannot measure the independent variable.**
- 6) Does the hypothesis clearly explain how a change in the independent variable will change the dependent based on scientific knowledge or observation?  
**Yes, the happier the gold fish the more distance it should cover per unit time.**
- 7) Never use terms such as "I", "me", "we", "they", a hypothesis must remain neutral.  
**The hypothesis is NOT neutral it uses "I".**