

Inductive carrying out
specific observations.
for example,



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Inductive and deductive reasoning are the basic components of scientific reasoning. Nevertheless, they do differ in some ways.

One of the differences between the both is that inductive reasoning is a bottom-up logical process while deductive reasoning is a top-down logical process. In other words, in inductive reasoning, we make a generalisation about something by carrying out specific observations. For example, every girl in my class likes pink, every girl in my brother's class likes pink, therefore all girls in the world like pink. On the other hand, in deductive reasoning, we will usually have a general statement about something and then move towards specific observations. For example, all animals must breathe to live, a tiger is an animal, therefore a tiger must breathe to live.

The second difference is that in inductive reasoning, the premises only support the conclusion and does not prove that the conclusion is right. Even if there were more premises, the conclusion only becomes better supported, not proven. This is because, we may have insufficient data or limited experience. Just as the example above, we come to a generalisation that all girls like pink after observing only two different situations. This does not in any way lead to a conclusion that is true because we have not asked each and every girl in the world about their favourite colour. This is opposite to deductive reasoning. If all the premises are true, therefore the conclusion must be true or proven.

Just like the example above, if my premise about all animals must breathe to live, it means that my conclusion is definitely true taking into consideration that my second premise about a tiger is an animal is right.

Inductive reasoning is frequently used in forming hypothesis and theories in scientific experiments. For example, when students conduct an experiment to see how fast sugar cubes dissolve in water at different temperatures, they will start to observe a pattern and generate a hypothesis that states, ' the higher the temperature, the faster the sugar cubes dissolve in water'. They will then come to a conclusion that sugar dissolves faster in hot water. This conclusion would then become a theory. On the other hand, deductive reasoning also allows students to apply a theory to a specific situation when carrying out scientific experiments. For example, knowing that mold grows easily in a warm, dark and moist environment, students will be able to think of the best solution by keeping their bread in the fridge to avoid mold from growing.

From how inductive and deductive reasoning are used in scientific experiments, it can be seen that inductive reasoning is used more commonly and frequently by students than deductive reasoning. This is the third difference between the two concepts of scientific reasoning, inductive and deductive reasoning.