

# [Science lake a is white, p2: swans in](https://assignbuster.com/science-lake-a-is-white-p2-swans-in/)

Science examines reality in an objective way by drawing conclusions from the collected evidence or observation.

Scientist uses two different methods to understand a problem when conducting an experiment. One of the methods used by scientist is inductive reasoning which draws general principles from specific instances. It is usually contrasted with deductive reasoning whereby it draws specific conclusions from general principles or premises. A premise is a previous statement or proposition from which another is inferred or follows as a conclusion. Inductive reasoning starts off with real-life examples of observations and trends which will then progress to generalisations and theories. This method is also known as the bottom-up approach as it starts with specific events and then it works its way up to the abstract level of theory. Through this, scientists will identify a pattern or trend of the cumulative data, which then they will be able to come up with a hypothesis to test out and finally develop some general conclusions or theories.

For example, P1: Swans in Lake A is white, P2: Swans in Lake B is white, C: All swans are white in colour. This conclusion is well supported, but it is not necessarily true as what has been observed might not have been valid due to the limited number of observations. On the other hand, deductive reasoning begins with theory and hypothesis. Scientists will then conduct research to test whether specific cases can be proven true through the theories and hypothesis. This is also known as the top-down approach as the process goes from the theory (the general) to the observations (the specific). During the scientific process, deductive reasoning is used to reach a logical true conclusion. Deductive reasoning relies heavily on the initial premises being correct.

If one or more premises are incorrect, the argument is invalid. For example, P1: All mammals have a backbone or a spine, P2: A dog is a mammal, C: Therefore, the dog has a backbone or a spine. Deductive conclusions are certain to be correct, provided that all the premises are true. If the generalisation is wrong, the conclusion may be untrue as the original premise is false.