

Using inductive and deductive reasoning

A. Goal of the lesson

To learn about inductive and deductive reasoning as both approaches can offer certain advantages.

After this lesson, students will be able to:

- define deductive and inductive reasoning
- explain the process of inductive and deductive reasoning
- apply concepts of deductive and inductive reasoning

B. Activities

Start with presentation of the theory about deductive and inductive reasoning (5-10 min)

Exercise 1 (15min)

Inductive reasoning:

Introduce students with task instructions: *You can see that the population increases as the years pass and you want to predict the population in the years to come. Using the information or evidence you have, you can guess at what the population will be in the next five years. Use the method of inductive reasoning.*

Students work in small groups creating their example/examples of inductive reasoning, after that groups share their ideas. Then they discuss the strength of inferences.

Exercise 2 (5min)

Deductive reasoning:

There are two premises given (teacher can prepare different examples), students have to create their own conclusions.

Premises 1 A supermarket manager believes candy products are an impulse buy.

2 An impulse buying is an unplanned decision to buy a product or service, made just before a purchase.

Conclusion:..... (E.g. *She deduces that she can sell more candy products by placing them close to store entry paths.*)

Students work in small groups creating their example/examples, after that groups share their ideas. After that they discuss the validity of inferences.

Exercise 3 (10min)

Deductive reasoning:

Introduce students with task instructions: *How could you disprove the statement, "All fish fly"? Use deductive reasoning.*

Students work in small groups creating their example/examples of inductive reasoning, after that groups share their ideas. Then they discuss the validity of inferences.

C. Preparation

Information about both types (inductive and deductive) of reasoning is prepared (See F. Theory).

D. Hints

All students should have opportunities to present their ideas.

E. Verification

1 Was it difficult to understand the difference between inductive and deductive reasoning?

2 How can student measure the validity of deductive inferences?

3 How can students measure how strong or weak inductive inferences are?

F. Theory

Inductive reasoning draws inferences from the observations in order to make generalizations (this type of reasoning was established and popularized by the Francis Bacon). We can apply it to unknown situations.

E.g. My favorite restaurant was closed yesterday and so it will be closed today too (prediction).

Every time you eat peanuts, your throat sweels up and you can't breath. So, you are allergic to peanuts.

Deductive reasoning

Video: [Deductive Reasoning: Examples & Definition](https://study.com/academy/lesson/deductive-reasoning-examples-definition-quiz.html)

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At the beginning of deduction, there is an assumed hypothesis or a theory. This assumption may be well-accepted or it may be rather more shaky, nevertheless, for the argument it is not questioned. First, there is a premise, then a second premise, and finally an inference.

In deductive reasoning conclusions are made from premises. They can be valid and invalid.

Valid:

Premises 1 All men are mortal.
2 Socrates is a man.

Conclusion: Socrates is mortal. (Aristotel)

Invalid:

Premises 1 Harold is a grandfather.
2 Harold is bald.

Conclusion: Therefore, all grandfathers are bald.



