

## Is it truly possible to vary quantities?

A real variable can have many facets, one of it being that it stands for a real number that can vary. Considering real-life quantities, the amount of money in a bank account can vary with time. Or the temperature can vary. It also makes sense to say, “if you vary the temperature”, for example the temperature of an oven during cooking.

Speed is also a quantity that one can easily imagine varying oneself, because for example one may push or not the gas pedal (or the break) during a drive, and the speed must indeed be changed according to traffic. A different kind of variation is “if you vary the amount of sugar” in a cake because the cake cannot be undone, so what is meant here is that with a new cake one can make a different choice and have a different amount of sugar.

In general, not everything that can be made to vary in a mathematical sense can also be made to vary in real-life. One example: the age of people in 2025 depends on their birth year, but clearly a person cannot change their birth year.

To convey the perplexity that pupils may have while been asked to vary quantities that cannot be changed by them, consider the example “if you vary the size of the dog”. Indeed, imagine you are giving medicine to your dog. The amount of medicine depends on the size of the dog, however it does not help you to imagine that your dog could be different from what it is, and in any case, you cannot change the size of your dog.

We should keep in mind that certain people tend to take things very literally, or at least it takes them some effort not to do so: some of them are among our pupils. Let’s consider this while using the construction “if you vary”.

*Disclaimer: The above reflection explores the meaning of the verbal construction "if you vary. " It is not based on a literature review, and the text is primarily intended as inspiration for teachers.*