

1. **Ethics** is the field of science in which problems are solved through thought experiments.

Not true. From an academic perspective, ethics is a branch of philosophy. It involves thinking about and defending right and wrong behavior. Used in a general sense, it is about one's personal values and beliefs. Ethics is more opinion than science.

2. **Dissection** is cutting something up.

Not true. According to Wikipedia, dissection is the process of disassembling and observing to determine an organism's internal structure and as an aid to understanding the functions and relationships of its parts. This involves learning and is not the same as cutting something up.

3. In academics, **argument** has a meaning that differs from how the term is used in general conversation. An academic argument has an agreed-upon logical structure that is often not true in informal disagreement.

True. According to Wikipedia, in the academic sense, an **argument** is an attempt to persuade someone of something by giving reasons or evidence for accepting a particular conclusion. The general structure of argument is a claim is made and then that position is supported by logical reasoning and/or evidence.

4. **Validity** is a type of scientific evidence.

Sort of. In science, mathematics, philosophy, and any other academic discipline, an argument must follow a specific structure to be considered valid. According to Wikipedia, an argument is considered valid "if and only if the truth of its premises includes the truth of its conclusion." An invalid argument doesn't use facts correctly. Instead of facts, persuasive language is used to mislead or appeal to emotion. It is easiest to understand what is "valid" or "invalid" through examples. (Note: If you enjoy the following thought experiments, consider studying philosophy in college.)

An example of a valid argument is given by the following well-known example (from Wikipedia):

All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.

The fact that the premises are true and the conclusion is true is not what makes this a valid argument. What **does** make this a valid argument is the logical necessity of the conclusion given the two earlier premises or statements. The argument would be just as valid were the premises and conclusion false. The following argument is of the same **logical form** but with false premises and a false conclusion yet, as an argument, it is equally valid:

All cups are green.
Socrates is a cup.
Therefore, Socrates is green.

No matter how the universe might be constructed, it could never be the case that these arguments should turn out to have simultaneously true premises but a false conclusion. The above arguments may be contrasted with the following invalid one:

All men are mortal.
Socrates is mortal.
Therefore, Socrates is a man.

In this case, the conclusion does not follow *unavoidably* from the premises. All men are mortal, but not all mortals are men. Every living creature is mortal; therefore, even though both premises are true and the conclusion happens to be true in this instance, the argument is invalid because it depends on an incorrect operation of implication. Such fallacious arguments are often easy to overlook.