Critical Thinking
Tutorial 4: Identifying Assumptions

Identifying unstated premises and conclusions

An **assumption** is a premise which is *not explicitly* stated in an argument, but which is *required* by the argument in order for the conclusion to follow.

Exercise 1 – Identifying unstated premises

Identify the unstated premise in the following arguments.

1. All penguins live in the Antarctic. **A2. THIS BIRD DOES NOT LIVE IN THE ANTARTCIC.** **Therefore:** **C.** This bird is not a penguin.	**1.** Anyone who lives in Paris lives in France. **A2. JEAN LIVES IN PARIS.** **Therefore:** **C.** Jean lives in France.
1. Evolution is not the best explanation for our observations. **A2. EITHER EVOLUTION OR CREATIONISM IS THE BEST EXPLANATION FOR OUR OBSERVATIONS.** **Alternatively:** **IF EVOLUTION IS NOT THE BEST EXPLANATION FOR YOUR OBSERVATIONS, THEN CREATIONISM IS THE BEST EXPLANATION FOR OUR OBSERVATIONS.** **Therefore:** **C.** Therefore, creationism is the best explanation for our observations.	**A1. IF TULIP BULBS ARE NOT CHILLED, THEY WON'T PRODUCE FLOWERS.** **2.** These tulip bulbs were not chilled before planting. **Therefore:** **C.** These tulip bulbs will not produce flowers.

Exercise 2: Standardising arguments with unstated premises

Standardise the following arguments, including any unstated premises.

(1) A photograph taken with a traditional camera can never convey the experience of being in a landscape, since only a three-dimensional representation of a landscape can convey the experience of being in that landscape.

P1 All representations that can convey the experience of being in a landscape *are three-dimensional representations of that landscape.*
A2 A traditional camera cannot produce a three-dimensional representation of a landscape. / Photographs taken with a traditional camera are not three-dimensional representations.
C A *photograph taken with a traditional camera* can never convey the experience of being in a landscape. / *Photographs taken with a traditional camera* are not representations that can convey the experience of being in a landscape.

(2) Only people who live in Brixton took part in the riots. So everyone who took part in the riots is from a deprived area.

P1 Everyone who took part in the riots lives in Brixton. / All people who took part in the riots are *people who live in Brixton.*
A2 Brixton is a deprived area. / All people who live in Brixton are people who live in a deprived area.
C Everyone who took part in the riots is from a deprived area. / All people who took part in the riots are *people who live in a deprived area*.

(3) It is impossible to know that any claim about the physical world is true, because no such claim can ever be conclusively proved.

A1 All claims that are known to be true are claims that have been conclusively proved.
P2 All claims about the physical world are *claims that cannot ever be conclusively proved.*
C All claims about the physical world are *claims that cannot be known to be true*.

(4) Having an efficient, attractive train network makes good economic sense. So, the city needs to purchase new train carriages, since the city should always do what makes good economic sense.

P1 Having an *efficient, attractive train network* makes *good economic sense.*

A2 In order to have an efficient, attractive train network, the city needs to purchase new train carriages.
Therefore: **A3 Purchasing new train carriages makes good economic sense.**
P4 The *city should always do* what makes good economic sense.
C The *city needs to purchase new train carriages*.

(5) When students do not find their assignments too challenging, they become bored and so achieve less than their abilities would allow. On the other hand, when students find their assignments too difficult, they give up and so again achieve less than what they are capable of achieving. It is therefore clear that no student's full potential will ever be realized.

P1 If students do not find their assignments too challenging, they become bored and so achieve less than their abilities would allow.
P2 If students find their assignments too difficult, they give up and so again achieve less than what they are capable of achieving.
A3 There is no middle ground: the correct level of difficulty is never achieved. All assignments are either too challenging or too difficult.
C No student's full potential will ever be realized. / All students achieve less than what their abilities would allow.

(6) Zoologist: Animals can certainly signal each other with sounds and gestures. However, this does not confirm the thesis that animals possess language, since animals do not use sounds or gestures to refer to concrete objects or abstract ideas.

A1 If a system of signals using sounds or gestures contains no expressions referring to concrete objects or abstract ideas, then that system is not a language.
P2 Animals do not *use sounds or gestures to refer to concrete objects or abstract ideas.*
C The fact that animals can signal to each other with sounds and gestures does *not confirm the thesis that animals possess language. / Animals do not possess language.*

(7) Students of the late twentieth century regularly campaigned against nuclear weapons. Students rarely demonstrate against nuclear weapons any more. Students must be less political than they used to be.

P1 Students of the late twentieth century regularly campaigned against nuclear weapons.
P2 Students rarely demonstrate against nuclear weapons any more.
A3 Campaigning against nuclear weapons is an accurate measure of how political students / a group is.
C Students must be less *political* than they used to be.

The philosophical argument of the week:

SALVIATI: If then we take two bodies whose natural speeds are different, it is clear that, [according to Aristotle], on uniting the two, the more rapid one will be partly held back by the slower, and the slower will be somewhat hastened by the swifter. Do you not agree with me in this opinion?

SIMPLICIO: You are unquestionably right.

SALVIATI: But if this is true, and if a large stone moves with a speed of, say, eight, while a smaller moves with a speed of four, then when they are united, the system will move with a speed less than eight; but the two stones when tied together make a stone larger than that which before moved with a speed of eight. Hence the heavier body moves with less speed than the lighter; an effect which is contrary to your supposition. Thus you see how, from your assumption that the heavier body moves more rapidly than the lighter one, I infer that the heavier body moves more slowly. (Galileo Galilei (1638), *Discorsi e Dimostrazioni Matematiche Intorno a Due Nuove Scienze*)

This classical thought experiment doubles as a *reductio ad absurdum*. In this type of argument, an assumption is made for the sake of argument, but is shown to lead to absurd (or even outright contradictory) conclusions. Therefore, the assumption itself must be flawed.

Watch Dan Dennett explain reductio ad absurdum arguments:
https://www.youtube.com/watch?v=sVUMAqMmy7o

Here is the **standard form of a reductio ad absurdum:**

1 Assumption p
2….
3….
Therefore:
4. q and not q: contraction!
Therefore:
C. Not p

- **Which assumption is Galileo trying to disprove? Which general principle is being targeted by the argument?**

The speed of a falling body is proportional to its weight and size. Heavy bodies fall more quickly than light ones, etc.

- **What is the conclusion of the argument? What is the thought experiment supposed to show?**

  The speed of falling bodies is independent of weight; bodies with different weight fall with equal speed. "And so, Simplicio, we must conclude therefore that large and small bodies move with the same speed, provided only that they are of the same specific gravity."