



Philosophy

**Arguments in Action (National 5
and Higher)**

Additional Support

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Arguments in Action — Mandatory Content:

National 5

Candidates must be able to identify, explain and give examples of the following terms to show their understanding:

- ◆ statement
- ◆ argument
- ◆ premise
- ◆ conclusion
- ◆ valid and invalid

Candidates must be able to:

- ◆ distinguish statements from questions, commands, exclamations and arguments
- ◆ identify premises and conclusions in an argument
- ◆ present an argument in standard form
- ◆ analyse simple arguments
- ◆ identify, explain and give examples of the following common fallacies:
 - attacking the person
 - false dilemma
 - illegitimate appeal to authority
 - slippery slope

For Higher

- ◆ All candidates should demonstrate knowledge and understanding of arguments by:
- ◆ Distinguishing statements from questions, commands, exclamations and arguments.
- ◆ Distinguishing arguments from other types of writing such as descriptions, explanations and summaries.
- ◆ Identifying and describing the components of an argument — premises/reasons, conclusions and inference indicators, i.e. premise and conclusion indicators.
- ◆ Describing what makes the premises in an argument acceptable – the premise:
 - Is known a priori to be true
 - Is a matter of common knowledge
 - Is plausible – it is reasonable to take it to be true
 - Is unambiguous
 - Appeals to an appropriate authority
 - Properly represents the facts pertaining to the conclusion
- ◆ Describing what makes the premises in an argument relevant – the premise:
 - Provides some justification to support the conclusion
 - Gives support to another relevant premise
 - Contains an appropriate analogy

- Attacks the claim rather than the person putting forward the claim
- ◆ Describing what makes the premises in an argument sufficient to draw the conclusion:
 - The premises are acceptable and relevant
 - The premises are enough to engender a well-founded confidence in the conclusion
- ◆ Presenting an argument in standard form

All candidates should analyse arguments by:

- ◆ Recognising, explaining and constructing diagrams that represent:
 - linked arguments – where the premises are dependent
 - convergent arguments – where the premises give independent support to the conclusion.
 - serial arguments – where there is at least one intermediate conclusion.
- ◆ Identifying whether an argument is using inductive or deductive reasoning
- ◆ Identifying different methods of argumentation:
 - analogical arguments, including distinguishing analogical arguments from analogical explanations.
 - The use of counter examples to show that a universal statement is false.

All candidates should evaluate arguments by identifying, explaining and giving examples of the following, including making reference to acceptability, relevance and sufficiency where appropriate:

Issues primarily relating to acceptability:

- ◆ ambiguity – including lexical ambiguity and structural ambiguity.
- ◆ appropriate appeals to authority - including recognising the criteria that might be used to distinguish legitimate appeals to authority from fallacious appeals to authority.
- ◆ slippery slopes—including what is meant by a 'slippery slope', what is meant by a 'slippery slope argument'; the main features of slippery slope arguments; what would distinguish an admissible slippery slope argument from a fallacious slippery slope argument.

Issues primarily relating to relevance:

- ◆ *ad hominem*s—including *ad hominem* abusive, *ad hominem* circumstantial and *ad hominem Tu Quoque*. Candidates should also be able to discuss when an 'attack on the person' is not fallacious.
- ◆ fallacious appeals to emotion — including recognising the criteria that might be used to distinguish legitimate appeals to emotion from fallacious appeals to emotion.
- ◆ inappropriate poor analogies — candidates should be able to explain how pertinent differences between the things used in the analogy serve to undermine the analogical reasoning.

Issues primarily relating to sufficiency:

- ◆ deductive validity —i.e. an argument is valid when it is impossible for the premises to be true and the conclusion false.
- ◆ inductive strength — including being aware that, unlike deductive validity, inductive strength is a matter of degree and, however strong the argument, the conclusion is never guaranteed in the same way that it is with deductive reasoning.
- ◆ conductive strength—including being aware that in a conductive argument, although the premises will be assessed individually with regard to acceptability and relevance, they are considered together with regard to sufficiency and that the addition of premises will strengthen an argument and the removal of premises will weaken an argument.
- ◆ post hoc ergo propter hoc — including being able to discuss whether it is ever appropriate to take temporal order as a basis for having an increased confidence in a causal link.
- ◆ formal fallacies—including being able to explain the distinction between formal and informal fallacies.
 - denying the antecedent—any argument that has the form [if p then q],[not p], therefore [not q], i.e. the error of mistaking a sufficient condition for a necessary condition.
 - affirming the consequent—any argument that has the form [if p then q],[q], therefore [p], i.e. the error of mistaking a necessary condition for a sufficient condition.

In all cases candidates should be aware of the distinction between artificial examples designed to illustrate a topic and realistic examples that might genuinely affect an argument. For example, an instance of ambiguity may effectively illustrate structural ambiguity and may also be used for comic effect but the context or common sense might mean that no real confusion will occur.

Doing Philosophy:

“Philosophy, as I shall understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All definite knowledge — so I should contend — belongs to science; all dogma as to what surpasses definite knowledge belongs to theology. But between theology and science there is a No Man’s Land exposed to attack from both sides; this No Man Land’s is philosophy.” 1

Bertrand Russell “A History of Western Philosophy”, p. 1

It can be a difficult task to explain exactly what studying Philosophy involves or what it means, but a key idea is that Philosophy is an attempt to resolve a question of the right sort through the use of reason as opposed to faith, revelation, force, etc.

Before **you** can do philosophy, you must have the courage to examine your cherished beliefs critically, be willing to advance tentative claims, and place “truth” as the end, not winning the argument.

In studying the **Arguments in Action** we are focusing on the method of reasoning. In so doing, the aim is to make the process of identifying ‘good’ (logical, correct) reasoning from ‘bad’ (incorrect, impermissible) reasoning more formal. In this way one can hope to develop a critical approach to argument and debate, furthering your own position as well as identifying the strengths and weaknesses of other people’s.

“If an opinion contrary to your own makes you angry, that is a sign that you are subconsciously aware of having no good reason for thinking as you do. . . . So whenever you find yourself getting angry about a difference of opinion, be on your guard; you will probably find, on examination, that your belief is going beyond what the evidence warrants.”2

Bertrand Russell “An outline of intellectual rubbish”, p. 232

1Russell, Bertrand, “History of Western Philosophy” Routledge, 24 Feb 2004, p1.

2 Russell, Bertrand, “Unpopular Essays”, Routledge, 4 Mar 2009, Chapter 7 - An outline of intellectual rubbish, p232.

What is an argument?

In Philosophy the word 'argument' means something quite specific and this can be different from how it is used in everyday language. Although it contains the ideas of a conflict, debate or discussion that is not all that it means. It is more than simply giving your opinion too. An argument in Philosophy is an attempt to persuade others of a particular claim using a process of reasoning. A helpful definition is this:

An argument is a series of statements (premises) given in support of a conclusion (the point that is being argued for)

To get our heads round this it is helpful to understand what the different terms used here mean. So we will start by looking at the concept of statements.

Statements:

A statement is a kind of sentence used in language that is particularly important to know and understand when studying arguments. Statements are defined as declarative sentences that can be judged to be either true or false. What this means is that statements make claims or assert that something is, or is not, the case.

Examples of sentences that are (or make) statements:

"The earth is spherical."

"A triangle has three sides."

"Edinburgh is the capital of Scotland."

Examples of sentences that are not (or do not make) statements:

"Who did that?"

"Be quiet!"

"Mmm lovely"

A good test for working out whether something is a statement in English is to try and decide whether it is correct to say that it is true or false. A way to do this is to add "It is true that...." in front of the sentence. If the resulting sentence makes sense then it is a statement. Otherwise it is not.³

The reason that statements are important for us is that arguments are built using statements. Other kinds of sentence usually do not have a role in an argument. However, there are some exceptions to this. Occasionally when people are using ordinary language to construct their arguments they use other kinds of sentences to imply a particular statement. In these cases we need to take those implied statements into account when considering the person's argument.

³ <http://philosophy.hku.hk/think/logic/statements.php>

For example:

“Don’t you have to get up right now? If you stay in bed any longer you will be late for school.”

Here the person arguing is using a **rhetorical question** to imply the claim that they are arguing for, which is that “You should get up right now”.

When studying arguments we need to look at all the sentences that are presented and consider which are statements, or imply statements, and which do not.

Conclusions:

According to our definition above an argument is a series of statements, which we call ‘premises’, given in support of a **conclusion**. The conclusion is the point that is being argued for. So the conclusion of an argument is the claim that the arguer is trying to convince you of. They provide reasons to support this claim, which they hope will be enough to give you good reason to believe their claim. If a series of sentences doesn’t have a point that it is trying to convince their audience of then it is not an argument.

Compare these dialogues:

1

Ysabelle: I think that Radiohead are one of the best pop bands of all time.

Zanab: Why do you think that?

Ysabelle: I just really think that they are.

2

Ysabelle: I think that Radiohead are one of the best pop bands of all time.

Zanab: Why do you think that?

Ysabelle: Radiohead are constantly evolving, and their records are in the very top of every genre they visit. Other bands often seen as one of the best of all time can usually only do one genre well so the fact that Radiohead can do every genre so well makes them one of the best.

In the first example, Ysabelle is just giving her opinion about Radiohead as a band. She doesn’t give any reasons for why she believes what she does. She is simply stating how she feels about them. Whereas in the second dialogue Ysabelle gives evidence to support what she thinks is the case. She uses reasons to support the point she is trying to prove. This then counts as an argument. The conclusion of Ysabelle’s argument is that “Radiohead are one of the best pop bands of all time.”

We use language to do lots of things, and in Philosophy it is important to distinguish arguments from other types of writing. These can include giving opinions, as shown above, as well as descriptions, explanations and summaries. To work out if an argument is present we need to determine whether or not the person is arguing for a particular point. It is not enough to be given statements that could be true or false. An argument involves giving reasons why someone should believe a claim to be true or false. Although arguments can be complex and their reasoning can be difficult to understand there can be some very helpful clues that we can use to work out if someone has presented an argument or not. Certain words are often used to indicate that a conclusion is coming. Words like “therefore” and “so” usually tell us that a conclusion will follow. Take the following argument:

Nearly everyone knows that smoking causes lung cancer and heart disease. Even so, about a third of the population still smokes. Therefore, knowing the dangers of smoking is not enough to get people to stop smoking.

The use of ‘therefore’ tells us that the point the person is arguing for is coming next. This can be helpful for working out when arguments are present.

- ◆ other examples of words and phrases that indicate a conclusion include:
- ◆ so,
- ◆ it follows that
- ◆ hence,
- ◆ consequently
- ◆ suggests/proves/demonstrates that.....
- ◆ entails, implies.....

Although indicator words can give us clues that arguments are being provided, sometimes the person arguing does not provide us with these clues. Nor do conclusions always come at the end of a process of reasoning. In fact, they often come at the start. The above argument could easily have been presented in this way:

Knowing the dangers of smoking is not enough to get people to stop smoking. Nearly everyone knows that smoking causes lung cancer and heart disease. Even so, about a third of the population still smokes.

Even though the conclusion comes at the start and there is no indicator word present, we can still tell that this is an argument. The key is that an argument is meant to be persuasive and when we are deciding if an argument is present, we should look at whether there is something the arguer intends us to be persuaded of. This can also help us to distinguish between some of the other types of writing mentioned above. Take the following example:

The bus was late, so I was late for school.

This is not an argument, even though this looks very much like an argument. It even uses the word “so” which is often an indicator of a conclusion. However, if we are careful to consider what is the point of this statement we can see that the intention behind this statement is not to try to persuade us of anything. It is given as an **explanation** as to why

the person was late. Consider the difference between the example above and the next example:

The bus is late, so it is likely that I am going to be late for school.

In this example, the author is clearly trying to convince us that they are likely to be late for school. So identifying conclusions in an argument is not always straightforward, but we have now encountered two things that can guide us:

1. The presence of conclusion indicator words.
2. The presence of a claim for which reasons appear to be offered.

Premises

We already looked at some ways to identify the conclusions of arguments. Now let's look at some helpful ways to identify the premises. The premises are the reasons or evidence given in support of the conclusion. So once you have identified the conclusion, it is helpful to ask "why am I meant to believe this claim?" The reasons given are the premises. We can also use indicator words to help identify premises.

Words/phrases that might indicate premises follow include:

- ◆ because
- ◆ since
- ◆ firstly, secondly, ...
- ◆ in view of the fact that
- ◆ ...follows from....
- ◆ may be inferred/deduced/derived from ...

Activity 1:

Create your own argument, using appropriate premise and conclusion indicators, for the following conclusions:

You should eat healthily

Murderers should face the death penalty

Telling lies is wrong

Activity 2:

Look at the following series of statements:

- a) Identify whether they include an argument or not.
 - b) If you think it is an argument, identify the conclusion.
1. The percentage of young people aged 13-15 in the UK who drink alcohol each week is the highest in the world. This suggests that there should be a campaign to educate young people about the dangers of drinking.
 2. So it is raining heavily and this building might collapse. But I don't really care.
 3. Having a pet is good for you. We know this because research shows that pet owners are less likely to be depressed than the rest of the population.
 4. This year the incidence of extreme snow in Scotland has been very high. The worst months were March and April with some areas experiencing as much as 20-30 inches of snow?
 5. Studying critical thinking can help you to analyse and evaluate arguments in a structured and reasoned way. This can help you to make better decisions and better understand your own beliefs and values. For these reasons, everyone should study critical thinking.
 6. No geese are felines. Some birds are geese. Therefore, some birds are not felines.
 7. Most examinations impose tight time limits on candidates. But this is difficult to justify. It prevents good candidates from demonstrating their ability in a subject. Most employers are happy to employ people who take a bit more time to find a well thought out solution to a problem.
 8. You should not give knives to young children because they are dangerous.
 9. Cutting the interest rate will probably have no effect on the stock market this time round. People have been expecting a rate cut all along and this factor has already been reflected in the market.
 10. After years of hard work and raucous shows, Biffy Clyro became overnight stars of rock in 2007. They're now one of the country's biggest acts.

Formalising Arguments

To formalise an argument is to put it into the “Standard Form”. The standard form of an argument is a way of presenting the argument which makes clear which statements are premises, how many premises there are and which statement is the conclusion. In standard form each premise takes a new line and the conclusion of the argument is listed last. The premises and conclusion are separated by a line called ‘the inference bar’.

In standard form, an argument is presented like this:

P1 Premise 1
P2 Premise 2
P3 And so on for as many premises as there are in the argument.

C Conclusion

For example:

P1 I'm on leave this week.
P2 I never answer work emails when I'm on leave.

C I'm not answering work emails this week.

When you formalise an argument, as well as setting out the premises and conclusions as above, you should also tidy the argument up so that each statement makes sense as a standalone statement. This means getting rid of any sentences that don't contribute to the argument, such as commands or questions. You should also include statements that have been implied rather than stated, such as ones implied by rhetorical questions.

See the following worked example:

If Highers were difficult wouldn't lots of people fail them? The pass rates are very high. So Highers can't be that difficult. It's not like it was in my day!

List the statements, including those implied statements:

1. If Highers were difficult, lots of people would fail them. (This was written as a rhetorical question.)
2. Higher pass rates are very high.
3. Highers can't be that difficult. (Note we have taken out the “So” at the start of this statement in order to make it a meaningful standalone statement)
4. It's not like it was in my day! (This statement does not contribute to the argument.)

Putting it in standard form:

1. If Highers were difficult, lots of people would fail them.
2. Higher pass rates are very high.

C: Highers can't be that difficult.

Here is a useful checklist for formalising arguments.

1. List the sentences taking a new line for each.
2. Eliminate unnecessary sentences that don't contribute to the argument.
3. Re-write each statement so that it makes sense on its own and where possible use the same words and phrases across your statements.
4. Remove any context-dependent words.
5. Make sure you don't change the meaning of a statement when you rewrite it.
6. List the premises giving each a new line and number them in order.
7. Draw a line (the inference bar)
8. Put the conclusion underneath the inference bar.

Activity 3

Write the argument out in standard form labelling premises and conclusions accordingly.

- (a) Pete is either English or Scottish. Pete says that he is not English. So he must be Scottish.
- (b) If the Government wants to create a landfill here they should compensate those who live in the area. Landfills are ugly and can smell very bad. These people did not choose to live next to a landfill.
- (c) Candidates who cram immediately before examinations usually get lower grades than those who do not. I certainly won't make that mistake. I'm not even going to open a book during the exam period. That should give me a much better chance of doing well.
- (d) If the suspect had been a stranger, Igor would have barked loudly when they came into the room to take the money Igor was guarding. But Igor didn't make any noise. So the suspect must be an acquaintance.
- (e) Darwin's theory of evolution is just that, a theory. Theories are just speculation with no evidence behind them. We don't want our children to learn theories with no evidence behind them, so we shouldn't allow the theory of evolution to be taught in school.
- (f) What justification can equality find in the nature of man? If each individual is unique, then to make them equal would be to destroy most of what is human in him. We do not want to destroy what makes us most human.

Analysing Arguments – Validity and Soundness (Deductive Reasoning)⁴

When it comes to analysing an argument it can be helpful to consider what the aim of argumentation is. In general we can say that the aim is to attain truth. Because this is the case it leads us to two very important criteria for analysing arguments. These criteria are called validity and soundness.

Validity

To understand what logical validity is and why it is important it is helpful to consider some examples.

Compare the following two arguments:

1. P1 No one who believes in human rights should support torture of any form.
 P2 You believe in human rights.

 C You should not support torture of any form.

2. P1 Torture can be mental or physical harm to others.
 P2 Torturing criminals can help gain information that can prevent future crimes.

 C You should not support torture of any form.

Both arguments come to the same conclusions, but intuitively there is something better about the 1st argument. It seems like the conclusion follows logically from the claims made in the premises. In the 2nd argument the premises are clearly related to the conclusion as they are all about torture; however there does not seem to be a connection between the reasons provided by the premises and the conclusion drawn. In a valid argument the argument is structured so that there is a connection between the premises being true and the conclusion being true.

The connection is that if you accept the premises as true you are compelled to believe that the conclusion is true. Let's look at a simple example:

- P1 All monkeys are mammals
P2 Arthur is a monkey

C Arthur is a mammal

⁴ For now our analysis of arguments is focused only on deductive reasoning. We will introduce Inductive and Conductive arguments further in these materials and will look at how to analyse them at that point.

If we accept that monkeys are mammals, and that Arthur is a monkey then it follows using logic that Arthur would have to be a mammal too. It is not possible for the premises to be true and the conclusion false. This means that this is a valid argument.

Definition of a valid argument: An argument is valid if and only if there is no logically possible situation where all the premises are true and the conclusion is false at the same time.⁵

Rejecting the conclusion in a valid argument

Assessing the validity of an argument is one way to decide if an argument is good or not. If an argument is valid then the only way to reject its conclusion is to disagree with one of the premises. Some valid arguments do not have true conclusions.

What do you think this tells us about the premises?

What we can tell is that at least one of their premises must also be false. Look again at the definition of validity. A valid argument is one where it is impossible for all of the premises to be true and the conclusion false, so if the conclusion of a valid argument is false then the only way this is possible is if some of the premises are not true. In fact we can construct a valid argument for this claim!

Activity 4:

Present a valid argument to show that if an argument is valid and has a false conclusion that there must be at least one false premise.

Proving an argument to be Invalid

An invalid argument is one where we are not forced to believe the conclusion based on our premises. This means that it is possible that the premises are true and the conclusion is false. In order to work out whether or not an argument is invalid we try to think about a circumstance in which the premises could all be true and the conclusion false.

Example

P1	All monkeys are mammals
P2	Charlie is a mammal
<hr/>	
C	Charlie is a monkey

⁵ <http://philosophy.hku.hk/think/arg/valid1.php>

When we think about this argument we can see that it is invalid because even if we agree that all monkeys are mammals and that Charlie is a mammal we can still say that Charlie may not be a monkey. For example Charlie could be a human being, a cat, dog or any other kind of mammal. Therefore we can envisage a situation where the premises are both true, but the conclusion is false.

Validity and Truth

A common mistake that candidates studying arguments in Philosophy often make is to confuse validity with truth, so it is important to clarify just a few key points. Firstly, the idea of validity applies to the argument as a whole and the structure of it. We don't assess premises to be valid or invalid because it is not appropriate to do so. When we assess a premise we judge whether it is true or false. Consider the following examples of valid arguments:

P1 If the moon was made of cheese it would have craters (False)

P2 The moon is made of cheese (False)

C The moon has craters (True)

P1 The capital city of Scotland is in America (False)

P2 Edinburgh is the capital city of Scotland (True)

C Edinburgh is in America (False)

P1 No mammals have scales. (False)

P2 All tigers are mammals. (True)

C Therefore, no tigers have scales (True)

P1 If you eat toast with marshmallows, your head will explode. (False)

P2 Millions of people eat toast with marshmallows. (False)

C Millions of peoples' heads will explode. (False)

Each of the above arguments is valid even though they have one or more false premises. The key to remember is that valid arguments are what we call truth-preserving. This means that when we start with true premises, the truth is preserved in the conclusion. Where we start with one or more false premises then we can have conclusions that can be either true or false.

In summary:

- ◆ 'Validity' is a concept that can only be applied to arguments
- ◆ 'True' and 'false' are concepts that can only be applied to statements
- ◆ Valid arguments can have false conclusions
- ◆ False statements can be premises in valid arguments
- ◆ Valid arguments are truth preserving
- ◆ Only an invalid argument can have all true premises and a false conclusion.

Activity 5:

Identify which of the following arguments are valid.

1. P1 If he loves me then he gives me flowers.
P2 He gives me flowers.
C He loves me.
2. P1 All cows have wings.
P2 Raphael does not have wings.
C Raphael is not a cow.
3. P1 The president of the United States must be 35 years of age or older.
P2 Justin Bieber is president of the United States.
C Justin Bieber must be 35 years of age or older.
4. P1 The Cookie Monster eats all the cookies he likes.
P2 These cookies haven't been eaten.
C The cookie monster must not like these cookies.
5. P1 All philosophy teachers are people.
P2 Trip is a philosophy teacher
C Trip is a person.
6. P1 Either President Lincoln was assassinated, or he was killed in an accident.
P2 President Lincoln was not killed in an accident.
C President Lincoln must have been assassinated.
7. P1 It is January.
P2 January is in the wintertime.
C It must be winter.
8. P1 It is February.
P2 February is in the wintertime.
C It must be snowing.
9. P1 If Jane has a cat, then Jane has a pet
P2 Jane has a pet
C Jane has a cat
10. P1 If E.T. phones home, then blue is Enzo's favourite colour
P2 It is not the case that blue is Enzo's favourite colour
C It is not the case that E.T phones home

Soundness

When we began looking at evaluating arguments we agreed that it is important to keep in mind the aim of arguments: to find truth. We have seen that having a valid argument is not enough to achieve this aim, as with validity we can still have false conclusions. We also need the premises in our argument to be true. We define a **Sound Argument** to be one that is both valid and has true premises.

Definition of a sound argument: a valid argument with true premises

When constructing an argument we are aiming for truth so ideally we are aiming towards achieving sound arguments. A sound argument **guarantees** us a true conclusion. An argument can be unsound for any of the following reasons:

- ◆ It is invalid
- ◆ It has a false premise
- ◆ It is invalid and has a false premise.

Activity 6:

Explain why a sound argument guarantees a true conclusion.

Activity 7

1. State whether the following arguments are a) valid and b) sound.
 - a) All politicians are liars
John is a politician
John is a liar
 - b) All cats are carnivorous
Pickles is carnivorous
Pickles must be a cat
 - c) Some actors are rich
Most actors are talented
So, at least one actor is both rich and talented
 - d) Most cats have tails
Most cats have ears
So, at least one cat has both ears and a tail
 - e) According to the Human Rights Act, everyone has a right not to be tortured or treated inhumanely.
Asylum seekers in the UK are detained in inhumane conditions.
Asylum seekers in the UK are having their human rights breached.

2. Pick a moral issue you feel strongly about. Create a valid argument to support your beliefs.
3. Create a valid argument to support the opposing view.
4. Explain why you believe the opposing argument is unsound.
5. Are the following statements true or false? Why?
 - a) All invalid arguments are unsound.
 - b) All true statements are valid.
 - c) To show that an argument is unsound, we must at least show that some of its premises are false.
 - d) An invalid argument must have a false conclusion.
 - e) If all the premises of a valid argument are false, then the conclusion must also be false.
 - f) If all the premises and the conclusion of an argument are true, then the argument is valid.
 - g) All sound arguments are true.

Complex Arguments - Hidden Premises:

So far, most of the arguments we have looked at have been simple arguments with 2 premises and a conclusion. Some arguments can be more complicated and it can take a bit more work to identify the claims that are being used to support the conclusion being drawn. This is the case when the arguer uses a hidden premise or assumption in their argument that they have not explicitly stated. Look at this argument.

“You should not give whole grapes to babies because whole grapes can be a choking hazard”.

As it stands, this argument is not valid. It requires an assumption which is important to draw its conclusion. This assumption must be something that ties the premise to the conclusion. In this case the statement that *“You should not give choking hazards to babies”* links the premise provided to the conclusion. If we add this premise into the argument then it looks like this:

P1	You should not give choking hazards to babies
P2	Whole grapes can be a choking hazard
<hr style="border: 1px solid black;"/>	
C	You should not give whole grapes to babies

This argument is valid and it is reasonable to assume that the arguer was making this assumption in presenting the argument in this way. In everyday life, the arguments we normally encounter are often arguments where important assumptions are not made explicit. It is an important part of critical thinking that we should be able to identify such hidden premises.

So how should we go about identifying hidden premises? There are two main steps involved. First, determine whether the argument is valid or not. If the argument is valid, the conclusion does follow from the premises, and so the premises have shown explicitly the assumptions needed to derive the conclusion. There are then no hidden premises involved. But if the argument is not valid, you should check carefully what additional premises should be added to the argument that would make it valid. Those would be the hidden premises. Usually they are left unstated because the claim is so obvious that the arguer feels it is unnecessary to state it. Sometimes this is not the case and hidden premises may be less certain or obvious claims. So even once we have identified a hidden premise that makes an argument valid we can still ask whether or not the assumption is true or false, or is an acceptable assumption to make. In this way we are also considering the soundness of the argument.

Activity 8

Identify a hidden premise required to make the following arguments valid.

1. If women have a right to their body, then abortion should be legal. Therefore, abortion should be legal.
2. Traces of ammonia have been found in Mars' atmosphere. So there must be life on Mars.
3. Cannabis should be legalised. After all it does not harm anyone.
4. Takeshi is a lizard, so Takeshi is a reptile.
5. Creationism is not the best explanation for our observations.
6. Therefore, evolution is the best explanation for our observations.
7. The death penalty is wrong because murder is wrong.
8. My bag of candy is better than yours, because mine has more red pieces.
9. Everyone should drink raw cow's milk, because it is natural and not processed.
10. "You won't like my banana loaf because it has walnuts in it."
11. "No one wants to kiss a person with bad breath, therefore you shouldn't smoke"

Complex Arguments - Intermediate Conclusions

Arguments are often longer and more complicated than the ones that we have examined so far. Many longer arguments contain an intermediate conclusion before the main conclusion. Have a look at this example:

“Very cold winters lead to high numbers of elderly people needing to be admitted to hospital. We are expecting a very cold winter. So we should expect high numbers of elderly people needing to be admitted to hospital. We will need to make sure that we have enough hospital beds to meet demand.”

In this example, the third statement is in the form of a conclusion, indicated by the word ‘so’. However, the argument continues to a fourth statement. The third statement is therefore an intermediate conclusion, which is supported by the first two statements. Every intermediate conclusion then goes on to act as support for the next stage of the argument – it acts like a reason for the main or overall conclusion.

Definition of Intermediate conclusion: a conclusion that is meant to serve as a premise for a later conclusion (possibly the final conclusion of a complex argument).
--

Here’s another more complex example to look at:

“Don’t you agree that eating meat is just wrong?”

“After all, it involves harming animals. I think it is wrong to harm any life because all life is created by God and anything created by God is sacred. Surely it is wrong to harm something that is sacred.”

P1	All life is created by God.
P2	Anything created by God is sacred.
P3	It is wrong to harm something sacred.
<hr/>	
IC	It is wrong to harm any life.
P4	Eating meat involves harming animals.
<hr/>	
C2	It is wrong to eat meat.

Activity 9

Write these arguments out in standard form, showing the main conclusions, intermediate conclusions and premises involved. For the first one the main conclusion (MC) has been identified for you.

1. Rocks exist. (MC) Sight is a reliable way to know what exists. If we see rocks, then they exist. We can see rocks.
2. Raj wants to audition for a local rock band. He plays guitar but is also a good drummer. The band plays gigs all over the city and therefore Raj would need a car to transport his drum kit around with him to gigs. Raj does not have enough money to buy a car and consequently it might be better if he auditioned on guitar.
3. To stay healthy you are advised to have five portions of fresh fruit or vegetables each day. You have only had four so far today so you should have a piece of fruit. We only have apples and oranges and you do not like oranges, so you should have an apple to maintain your good health
4. Coffee contains caffeine, which is a stimulant. Taking any stimulant before going to bed stops you from sleeping soundly and so drinking coffee before going to bed will stop you from sleeping soundly. A poor night's sleep may lead you to feel tired in the morning. Therefore drinking coffee before going to bed may cause you to feel tired in the morning.

Inductive and Deductive

Reasoning/Arguments:

Let's begin by investigating the concept of reasoning. Reasoning is the process of constructing thoughts into arguments. This is something you probably do every day. When you make a decision, you are using reasoning, taking different thoughts and making those thoughts into reasons why you should go with one option over the other options available. When you construct an argument, that argument will be either valid or invalid. A valid argument involves reasoning that is logical, where the conclusion is drawn from the premises alone.

Deductive Reasoning/Arguments:

In the process of deduction, you begin with some statements, called 'premises', that are assumed to be true, you then determine what else would have to be true if the premises are true. For example, you can begin by assuming that God exists, and is good, and then determine what would logically follow from such an assumption. You can begin by assuming that if you think, then you must exist, and work from there. In mathematics, you can also start with a premise and begin to prove other equations or other premises. With valid deductive arguments you can provide absolute proof of your conclusions, given that your premises are taken to be true. The premises themselves, however, remain unproven and they must be accepted on face value, or by faith, or - for the purpose of exploration - as part of the argument.

Examples of deductive arguments:

All men are mortal.
Joe is a man.
Therefore Joe is mortal.

A Bachelor is an unmarried man.
Bill is an unmarried male.
Therefore, Bill is a bachelor.

If the first two statements in the arguments are true, then the conclusion must be true.

Inductive Reasoning/Arguments:

Now consider the following inductive argument:

"Every day this year the number 47 bus has come to my bus stop around 7:15am."

"Therefore this morning the number 47 bus will come to my bus stop around 7:15am"

It should be immediately obvious that this argument is not valid because there is clearly a possibility that the number 47 bus has been delayed or cancelled today for any number of reasons. Yet, it seems like a perfectly good argument for believing that the number 47 bus

will come to the bus stop around this time today. It seems highly probable that if the bus has come at this time regularly in the past that it will do so today as well. This kind of reasoning is called inductive reasoning.

When it comes to Inductive reasoning (as opposed to deductive reasoning) the premises are seen as providing strong evidence for the truth of the conclusion. While the conclusion of a deductive argument can be certain, the truth of the conclusion of an inductive argument may be at best probable. Inductive reasoning is very important in ordinary life and science. We believe lots of things on the basis of limited evidence. The evidence might not logically guarantee that the belief is correct, but the belief can still be reasonable. For example, we see dark clouds in the sky and think it is likely to rain because that is what dark clouds have meant in the past. So we bring an umbrella with us and this seems like a very reasonable action. We see mould on our bread and know that bread with mould often makes people sick so think we will be sick if we eat it.

It can sometimes be difficult to determine whether an argument is meant to be taken as inductive reasoning, or is simply a badly presented invalid argument. The key difference between deductive and inductive arguments in this case is in the relationship the arguer takes there to be between the premises and the conclusion. If the arguer believes that the truth of the premises establishes the truth of the conclusion, then the argument is deductive. If the arguer believes that the truth of the premises provides only good reasons to believe the conclusion is probably true, then the argument is *inductive*.

What makes a good inductive argument?

Evaluating an inductive argument is obviously going to have to be different from evaluating a deductive one. It is not appropriate to evaluate on its validity or soundness because we have already said that inductive arguments provide only probable conclusions and valid deductive arguments provide certain conclusions.

Activity 10:

Discuss with a partner how we might evaluate an inductive argument. It may be helpful to remember that deductive arguments are assessed on whether or not they are valid or sound. What criteria might there be for judging inductive reasoning as good or bad?

Strong/Weak Inductive Arguments:

One factor we might consider is how much evidence we have for the conclusion drawn. An inductive argument which provides a lot of evidence for the conclusion seems like it would be better than one that has only a little evidence. If an inductive argument has lots of evidence for its conclusion then it is said to be **strong** while one which provides only a small amount of evidence is said to be **weak**. The strength of an inductive argument is not an absolute judgement in the way that deductive arguments are either valid or invalid. Rather, the strength of the argument is relative and we can say that one inductive argument is stronger or weaker than another.

Eg,

'I have seen 10 cats with tails; therefore all cats have tails'

is a weaker argument than

'I have seen a thousand cats with tails; therefore all cats have tails'

Cogent Inductive Arguments:

Although strong inductive reasoning is good, it is not very helpful if the premises of the argument are actually false. If a scientist has fabricated lots and lots of data to support their theory then we would not think that they had provided very good reason to believe the conclusions they have drawn. So a further criteria for assessing Inductive arguments is to look for the premises to be true. A strong inductive argument which also has true premises is said to be cogent.

Definition of a cogent inductive argument: a strong inductive argument with true premises.

So false premises or premises which can provide only weak evidence for the conclusion make the argument either not cogent or less cogent.

Activity 11:

Create a revision sheet which shows the differences between Inductive and Deductive Reasoning.

Give examples of each type to illustrate the differences.
Make sure to explain how we assess how good they are:

Deductive – Valid, Sound
Inductive – Strong, Cogent

Activity 12:

Make up your own examples of:

- a strong inductive argument which is not cogent
- a weak inductive argument
- a cogent inductive argument

Conductive arguments:

A further kind of argument we are going to look at is called a Conductive Argument. These kinds of arguments we encounter a lot in everyday life. They are quite similar to inductive reasoning in that they provide only probable conclusions rather than certain conclusions. Indeed there is debate amongst philosophers as to whether they count as a form of inductive reasoning or are a separate class of their own. An easy way to understand conductive arguments is to look at examples and this will help us to see how they differ from standard inductive reasoning.

"I have a number of reasons for believing capital punishment is wrong. Firstly, the risk of making a mistake and killing an innocent person is one that needs to be taken seriously. Second, it goes against the right to life that I believe all people have. It also can lead to a brutalisation of society and finally it is very expensive, usually costing more than life sentences."

Unlike in a standard inductive argument, in conductive arguments the support for the conclusion converges. Each premise works independently of the others to support the conclusion. If we investigated and found out that capital punishment was not actually more expensive than a life sentence that would not stop the other reasons against capital punishment being true. It could still be a good argument. It would, however, be slightly less strong than it was previously because we had one less reason for the conclusion. Equally, if we added some additional reasons against capital punishment - such as the fact that the evidence suggests it is not really a deterrent against serious crimes - this would add greater support for the conclusion, even though each reason works independently of the others. In standard inductive arguments the premises are all providing evidence of the same kind, such as having experienced a similar kind of event many times in the past and so assuming that it will be the same again in the future. In conductive arguments, the premises can be giving completely different kinds of evidence for the conclusion.

The premises in a conductive argument count separately in favour of the conclusion; they are put forward as separately relevant to it and need not be linked together to offer support. The argument weighs these factors to provide a basis for the conclusion. Conductive arguments are common in everyday reasoning, such as when we draw up a list of pros and cons, plusses and minuses, in order to make a decision (reach a conclusion).

Counter considerations

What this means is that, unlike other arguments, conductive arguments may include in their premises counter considerations — that is, factors which are negatively relevant to the conclusion. There is usually an assumption that the supporting factors outweigh the negatives, such as in the following example:

“Glasgow is a big, bustling city, which is full of life.”

“Glasgow has an efficient underground, bus and train network.”

“The flats in Glasgow are nice and not too expensive.”

“Living there is not so expensive.”

“I know some of my future colleagues and they are nice.”

“The weather is not great – it rains quite a bit.”

“There is easy access to lots of beautiful countryside outside of the city.”

“I will take the job in Glasgow.”

If one of the above premises turns out to be false or there are other negative considerations we have to add in then the argument may still lead to the conclusion, but it would be considered a weaker conductive argument.

Activity 13:

Come up with conductive arguments with at least 3 premises for the following claims:

1. It is more important to focus on building good relationships in life rather than developing your career.
2. Dogs are great pets.
3. We need to take care of the environment.

Argument diagrams:

An argument diagram is a diagrammatic representation of an argument showing the premises, conclusion and the relationship between them. Argument diagramming is a technique which makes a visual representation of an argument in order to make clear the structure. Various different methods of diagramming arguments exist. The first method is to provide a key for each statement included in the argument – the premises and the conclusions. These numbers are then used to show the structure of the argument. For example, take this simple argument:

Death is inevitable. So life is meaningless.⁶

First we provide a key with each statement that is part of the argument.

(1) = Death is inevitable

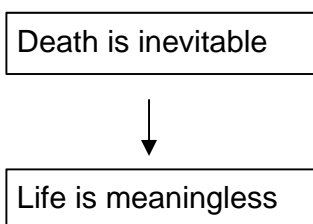
(2) = Life is meaningless



In the argument diagram, the arrow performs the same function as the inference bar in standard form, it identifies a conclusion is being drawn. The direction of the arrow points towards the conclusion. It can be helpful to imagine the arrow as representing the word “therefore”.

Another way that argument diagrams are constructed is to include the statements inside a box. This then does not require a key.

The above argument can be represented in an argument diagram as follows:



⁶ <http://philosophy.hku.hk/think/arg/complex.php>

In Higher Philosophy it is expected that candidates will be able to recognise, explain and construct diagrams that represent 3 different kinds of arguments as an argument diagram:

- ◆ linked arguments, where the premises are dependent.
- ◆ convergent arguments, where the premises give independent support to the conclusion.
- ◆ serial arguments, where there is at least one intermediate conclusion.

Candidates should know how these can be combined to form complex arguments.

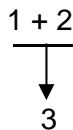
Here are some examples of each of these types of argument to show how they should be represented.

Linked Arguments:

“Edinburgh is in Scotland. Scotland is in the UK, so obviously Edinburgh is in the UK”

- (1) Edinburgh is in Scotland
- (2) Scotland is in the UK.
- (3) Edinburgh is in the UK.

Here is the corresponding argument map:



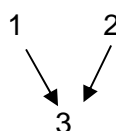
Note that the two premises work together to form the conclusion. If you take one of the premises away then the argument does not lead us to the conclusion which is drawn.

The plus sign indicates that the two premises are co-premises which work together to support the conclusion. In other words, they do not provide independent reasons for accepting the conclusion.

Convergent Arguments:

“Dogs are loyal and friendly pets. There is also evidence that people who have a dog tend to live longer and healthier lives than those who do not. Therefore dogs are great pets to have.”

- [1] Dogs are loyal and friendly pets.
- [2] There is evidence that people who have a dog tend to live longer and healthier lives than those who do not.
- [3] Dogs are great pets to have.



This diagram tells us that [1] and [2] are **independent** reasons supporting [3]. In other words, without [1], [2] would still support [3], and without [2], [1] would still support [3]. (Although the argument is stronger with both premises.)

Serial Arguments:

“You are allergic to most nuts, so you are probably allergic to walnuts. For that reason, you should probably not eat this cake with walnuts in it.”

1. You are allergic to most nuts.
2. You are probably allergic to walnuts.
3. You should probably not eat this cake with walnuts in it.



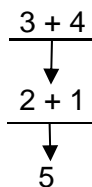
Note that (2) is an intermediate conclusion in a serial argument. It follows from (1) and leads to (3).

Complex Arguments:

Complex argument may combine elements of convergent, linked and serial arguments, as in this example

“Today is either Thursday or Friday. But it can’t be Friday because we get Philosophy on a Thursday and we are getting Philosophy today. So it must be Thursday.”

1. Today is either Thursday or Friday.
2. It can’t be Friday.
3. We get don’t get Philosophy on a Friday.
4. We are getting Philosophy today.
5. It must be Thursday.



In this diagram there are 2 linked arguments joined by an intermediate conclusion.

Activity 14:

Create argument diagrams for the following arguments:

1. Paris is in France, and France is in Europe. So obviously Paris is in Europe.
2. Since the solution turned red when the indicator was added, I conclude it is acidic, as acidic substances react with this indicator to form a red colour.
3. A life of crime is a poor career choice because sooner or later most criminals get caught and even if you were to get away with a crime you would eventually come to despise yourself for it.
4. Be a doctor! You've got the talent, you would enjoy the work, and you could help a lot of people. Plus, you could make a lot of money.
5. All expensive things are desirable. All desirable things make you feel good. All things that make you feel good make you live longer. So all expensive things make you live longer.
6. We can see rocks. If we can see rocks, then they exist. Therefore, rocks exist. Sight is a reliable way to know what exists. Therefore, if we see rocks, then they exist.

Different methods of argumentation: Analogical Arguments

Analogical explanations

An analogy is a comparison in which a concept or a thing is compared to something else that is similar to it in some way. It aims at explaining that concept or thing by comparing it to something we are already familiar with. Metaphors and similes are tools used to draw an analogy that you may have encountered in English.

To give an analogy is to claim that two distinct things are alike or similar in some respect. Here are two examples:

- ◆ **That's as useful as rearranging deck chairs on the Titanic:** It looks like you're doing something helpful but really it will make no difference in the end.
- ◆ **Life is like a box of chocolates – you never know what you're gonna get:** An often-used analogy from *Forrest Gump* shows that life has many choices and surprises, just like a box of chocolates.

Analogical arguments

The analogies above are not arguments. But analogies are often used in arguments. To argue by analogy is to argue that because two things are similar, what is true of one thing is also true of the other. Such arguments are called "*analogical arguments*" or "*arguments by analogy*". Here are some examples:

- ◆ Europa might support life because it has an atmosphere that contains oxygen just like the Earth.
- ◆ This novel is supposed to have a similar plot like the other one we have read, so probably it is also very boring.
- ◆ The government campaign against illegal drug use is like a literal war with shooting and bombing. You can't win a real war without shooting at the enemy so the government won't win the drug war without a "shoot on sight" order against drug dealers.

Analogical arguments are based on the belief that something unfamiliar is similar in some way to a familiar thing and that, because of this similarity, we might assume that it also resembles the familiar thing in another respect.

So if we present an analogical argument explicitly, it should take the following form:

(Premise 1) Object X and object Y are similar in that they both have property A.

(Premise 2) Object X also has property B.

(Conclusion) Object Y probably has property B.

Activity 15:

See if you can rewrite the analogical arguments on the previous page in this explicit form.

Evaluating analogical arguments

When it comes to evaluating analogical arguments, it is important to consider how similar the two things that are being compared actually are. It is also important to look at how relevant the similarities are to the conclusion being drawn. For example, both dogs and electric fans move, but does that make it likely that you can use a dog to cool down? The answer is almost certainly not. The reason is that the movement alone is not all that makes a fan cool. The kind of movement involved is just one of the other factors that relates to how good the object is at making things cool.

So how should we evaluate the strength of an analogical argument? Here are some relevant considerations:

Truth: We need to check that the two objects being compared are similar in the way it is claimed they are.

Relevance: We also need to make sure the things being compared are similar in a way that is relevant to the conclusion. For example, the fact that my winter coat and my summer rain jacket are both red has little relevance as to how warm they are. Whereas if they are both made of the same material then I might be able to conclude from the fact that one was warm that the other might also be.

Number: An analogical argument could be a conductive argument and as such will be stronger if there are several relevant similarities between the two things being compared. Imagine I was comparing two films, one which I have seen and really liked and another I have not yet watched. Several relevant factors might affect the likelihood I will also enjoy the other film:

- ◆ the movie was directed by the same director,
- ◆ the leading characters were played by the same actors/actresses,
- ◆ it was from a similar genre,
- ◆ they both reviewed well by critics.

Then we can justifiably be more confident in concluding that I will enjoy this other film.

Disanalogy: Even if the things being compared are similar in many relevant ways, there may be particularly relevant differences, or disanalogies, between the two things. If these are significant they can make the argument weak.

Activity 16

Evaluate these arguments from analogy:

1. We should not blame the media for deteriorating moral standards. Newspapers and TV are like weather reporters who report the facts. We do not blame weather reports for telling us that the weather is bad.
2. Democracy does not work in a family. Parents should have the ultimate say because they are wiser and their children do not know what is best for themselves. Similarly the best form of government for a society is not a democratic one but one where the leaders are more like parents.
3. P1) the world around us resembles the artefacts of human creation in that they both display complexity.
P2) the complexity in human artefacts comes from having been designed and made by intelligent beings (humans).
C) Therefore, the complexity in the world around us comes from having been designed and made by an intelligent being (God).
4. Dolphins and sharks have many similarities. They are both shaped very much the same, and are optimized for fast swimming. They are also both built for with strong dorsal, ventral and caudal fins. Finally, they both live the same way, by chasing down and eating smaller fish. So the fact that sharks have gills leads to the conclusion that dolphins must also have gills.

Counterexamples

A counterexample is something we can use to show that a universal statement is false. This could be a way to show that a conclusion in an inductive or conductive argument can't be true. It also could be used to dispute a universal statement used as a premise in any kind of argument. Counter-examples are used to show claims, such as 'All Fs are Gs' are false.

Consider the claim "all swans are white". This claim can be disproven by giving a counterexample — a single black swan. If there exists a single case of a swan that is not white then the claim that "all swans are white" must be false. Also consider the claim "no mammals lay eggs". Such a claim can be disproven by the example of a platypus.

In both cases, the initial claim is universal — it has to do with all entities of a certain group.

The counterexample shows that at least one entity of that group doesn't fit the description, and so the universal claim must be false.

Activity 17

Come up with counterexamples to deny the following general claims:

1. Adultery is always morally wrong.
2. It is wrong to kill someone who wants to live.
3. Breaking the law is always wrong.
4. All dogs have four legs.
5. Divorce is always wrong
6. Pleasurable experiences are always good.
7. "Without memory there can be no person"

Acceptability, Relevance and Sufficiency:

When it comes to evaluating arguments there are many different approaches that philosophers have taken. We already know that validity and soundness are criteria that can be used to analyse deductive arguments and that we can analyse the strength and cogency of inductive and conductive arguments. Another way we can judge arguments is by analysing and evaluating the relationship between the premises and the conclusion using the criteria of acceptability, relevance and sufficiency. We will now look at each of these criteria in turn to see how they can be applied to the premises in different arguments.

Acceptability:

A premise is taken to be acceptable if it is reasonable to take it to be true. Any premise that is known a priori to be true is a completely acceptable premise. An example of such a claim could be that “the shortest distance between two points is a straight line”. In an ideal world, all arguments would only be based on a priori, necessary truths, because then it would be really straightforward to determine whether they were true or not. In reality most arguments are based on less than absolutely certainly true premises and this is why we look at the criteria of acceptability. Where the premise is not an a priori truth a number of other factors will also contribute to how acceptable we take the premises to be. Is the premise a matter of common knowledge? i.e. is it something that most people would agree with? If it is not common knowledge, is it at least plausible? In other words, would it be reasonable to take it to be true? Is the premise unambiguous? Does it appeal to an appropriate authority? Does it properly represent the facts pertaining to the conclusion?

Relevance:

As we already discussed with arguments from analogy not all premises are relevant to the conclusion being drawn. With analogical reasoning the premises need to identify relevant similarities to the conclusion. In other arguments the premises can be more or less relevant to the conclusion. If we take a valid deductive argument then the premises will be completely relevant to the conclusion. When it comes to inductive and conductive reasoning the relevance of the premises to the conclusion may be more a matter of degree. In general, premises are relevant to the conclusion if they provide some justification to support the conclusion, they give support to another relevant premise, they contain an appropriate analogy, or they attack a claim rather than the person putting forward the claim.

Sufficiency:

The criterion of sufficiency is applied to ask whether the premises provide enough evidence for the conclusion being drawn. If the premises are sufficient to draw the conclusion then they are enough to engender a well-founded confidence in the conclusion provided that the premises are acceptable.

As you may have noticed these criteria are progressive; first we should look at how acceptable the premises of an argument are. If they are considered acceptable then we should look at how relevant they are to the conclusion drawn. If they are relevant then the next stage is to consider whether or not they are sufficient for the conclusion.

Fallacies:

When we are assessing arguments we will encounter many fallacies. These are common errors in reasoning that we come across often in everyday reasoning and arguments. These errors are so common that they have been given specific names. (n.b. sometimes the word 'fallacy' is used in a more general sense to mean any error in reasoning.)

There are 2 main categories of a fallacy, formal and informal fallacies. Formal fallacies are fallacious due to an invalid structure or form in the argument whereas informal fallacies may or may not be presented in a valid way. They are called informal because it is the content of the argument that is problematic and not because of the form the argument takes, even though they may well have a bad structure too.

Issues primarily relating to acceptability:

Ambiguity

A statement is ambiguous if it has or expresses more than one possible meaning. If we are trying to decide whether a premise is acceptable or not, we need to know what the premise means. If there could be more than one meaning, one which is acceptable and one which is not then this would be important to consider when assessing an argument. There are different ways in which a statement could be seen to be ambiguous. There are two types of ambiguity we are going to look at – lexical, or semantic, ambiguity and syntactic ambiguity.

Lexical Ambiguity occurs when a single word or phrase has more than one meaning.

Syntactic ambiguity, also called amphiboly or amphibology, is where a sentence may be interpreted in more than one way due to its ambiguous sentence structure.

Look at the following argument. What is the nature of the ambiguity?

P1) It is silly to fight over mere words.

P2) Discrimination is just a word.

C) It is silly to fight over discrimination.

To fully assess this argument it is helpful to learn about the fallacy of equivocation.

Equivocation is an error in reasoning that occurs when the meaning of an ambiguous term is switched during the process of reasoning. This is a way in which semantic ambiguity often affects arguments and can lead to an argument appearing to be valid when in fact it is not. If we consider the argument above, the word discrimination can have one of two meanings. One meaning is an action or policy based on prejudice or partiality, and this seems to be the way that we are meant to interpret it in the conclusion of the argument. The other meaning is simply the word “discrimination” itself. If we think the argument is using the latter meaning for both premise and conclusion (the word itself) then this is valid and probably sound, but perhaps a bit odd to speak of fighting over a word. If we take the first meaning for both premises and conclusion then although valid the second premise is definitely false.

It seems most likely that the arguer intends “discrimination” to mean the word in the premise and the action or policy in the conclusion and thus the argument is invalid.

Activity 18

In the following, identify any arguments in which the fallacy of equivocation is committed. Explain where the equivocation occurs. Remember that if a passage does not contain an argument, it cannot contain a fallacy of equivocation.

1. When he was asked to find the cube root of 27, he got the answer wrong. He simply wasn't right about that. He was wrong, which means there was something wrong with him. You can see this man is a flawed human being.
2. The poet refused to explain his work because he said that his poems would speak for themselves. But that can't be true. Why not? Poems are composed of words, and no words can speak for themselves. People have to speak words by using them in speech or in writing.

3. Your language and your arguments are garbage, and garbage only deserves to be thrown out.
4. A dispute that cannot be settled by the committee within the institution will be taken to an arbitrator, who will be selected by our president and his advisors. The arbitrator will hear all sides and reach her decision, which will be final.
5. The idea of God exists, so God exists in my mind. Therefore, God exists.

Amphiboly

The **fallacy of amphiboly** occurs when a sentence, because of its grammar, structure, or punctuation, can be interpreted in multiple ways. Unlike **Equivocation**, which is due to multiple meanings of a phrase, Amphiboly is due to syntactic ambiguity; ambiguity caused by multiple ways of understanding the grammar of the phrase.

Here is an example, in a cartoon, two elephants are driving their car down the road in India. They say, "We'd better not get out here," as they pass a sign saying: ELEPHANTS PLEASE STAY IN YOUR CAR

The argument would look like this:

- P1) Elephants stay in your car.
- P2) We are elephants.

- C) We better not get out here.

Upon one interpretation of the grammar, the pronoun "YOUR" refers to the elephants in the car, but on another it refers to those humans who are driving cars in the vicinity. According to the first interpretation, the above argument is valid, but with the second it is invalid.

Activity 19

Discuss the following two arguments with a partner and identify how amphiboly affects the acceptability of the premises.

1. Last night I caught a prowler in my pyjamas. Therefore, it is important to keep your pyjamas locked up securely where no one else can get them.
2. John told Henry that he had made a mistake. It follows that John has at least the courage to admit his own mistakes.

When we look at the examples above, the fact that there is equivocation and amphiboly taking place is fairly obvious and it seems highly unlikely that anyone would actually be convinced by the conclusions drawn. When ambiguity affects arguments presented by philosophers, the ambiguity is usually much more subtle and hard to identify and so we need to be on our guard to pick up on ambiguity in arguments.

Appeals to Authority:

In the section on **Acceptability** we saw that basing a premise on the say so of an appropriate authority can be a way to judge it to be acceptable. In a similar way if we take a claim to be true on the say so of an inappropriate authority, this can make the claim unacceptable.

Illegitimate Appeals to Authority:

An illegitimate appeal to authority is an informal fallacy. An illegitimate appeal to authority happens when a claim X is accepted because some person or group asserts that X is true,

without justifying the right of that person or group to be regarded as authoritative in this matter. An example of an illegitimate appeal to authority is the following:

“My best friend told me nobody ever checks if you have your phone with you in your exams, so I think it will be fine to bring your phone with you.”

Your best friend is not an appropriate authority on this matter. They may have information from other sources not mentioned in your argument, but just going on their say so here is not acceptable (It is also likely to get you into a lot of bother if you act on this claim and take your phone into your exam!).

To know what counts as an illegitimate authority it can be useful to consider what counts as a **legitimate** authority. A number of factors affect how legitimate an authority is seen to be. These are just some of the things we might look at.

A legitimate authority will:

- ◆ be making a claim within their area of expertise
- ◆ have sufficient expertise in a relevant subject
- ◆ be making a claim on which there is an adequate degree of agreement with other experts
- ◆ be free of significant bias
- ◆ be making a claim within a legitimate discipline
- ◆ have a reputation of being reliable
- ◆ not have a vested interest in you believing a particular claim

It is worth noting that citing a legitimate authority as a reason to believe claim X would give us good reason to believe the claim, but it would not guarantee the claim's truth.

Activity 19

Make up a short dialogue where someone commits the fallacy of Appealing to an Illegitimate Authority

Slippery Slope

Another kind of fallacy where the premises of the argument might be seen to be unacceptable is in the slippery slope fallacy. This fallacy is committed when an argument is given that suggests that one thing will inevitably lead to another with insufficient evidence. It claims that once one step has been taken in a particular direction there is nothing to stop further steps in that direction. Thus the name, slippery slope, as we can imagine that once you start sliding down a slippery slide, you are unable to get back up again, whether you want to or not. Here's a very simple example that you might have heard from some of your teachers before.

"I'm not giving you candidates any more exam tips or the next thing I know, you'll be asking me to sit the exam for you!"

Whilst it is possible that giving candidate's exam tips might lead to candidates expecting that their teachers sit the exam for them, it is clearly more likely that teachers simply give exam tips and leave it there.

Take another more complicated example:

"We should not legalise cannabis for medical use in the UK. If it is made legal for medical use then the use of cannabis will become normalised in people's eyes and it will soon lead to legalising cannabis for recreational use. This will make it more difficult to justify criminalisation of other drugs for recreational purposes, such as heroin and cocaine. Before you know it we will have a country full of drug addicts!"

Even though some of the claims in this argument may be acceptable, we can imagine many scenarios in which legalising cannabis for medical use would not lead us to the final claim that the country will be full of drug addicts. It is important to recognise that in slippery slope arguments, the first step is rejected on the basis that the final step is unacceptable. It is seen to involve unacceptable premises because we can imagine situations where the first step need not lead us to the final step (or to the bottom of the slope – metaphorically speaking).

There are two main types of slippery slope argument.

- 1 Those of the form 'If P then Q; If Q then R; if R then S; if S then T; T is undesirable; So not P'. P might involve some kind of commitment or concession, with Q, R, S & T being further but related commitments or concessions. This general form of argument is valid but is fallacious if any of the conditional statements are false.
- 2 Those of the form 'P increases the likelihood of Q; Q increases the likelihood of R; R increases the likelihood of S; S increases the likelihood of T; T is undesirable; So not P'. Here, P, Q, R, S & T may be events. This form of slippery slope argument is often fallacious because even though the likelihood of Q is increased by P, etc, Q is not guaranteed by P. This means that P can be far enough removed from T for the conclusion (that P should be rejected on the grounds that it will increase the likelihood of T) to be insufficiently justified. Just because P increases the likelihood of Q, it is not a foregone conclusion that Q will follow P, and so on.

Definition of a slippery slope fallacy - This fallacy is committed when an arguer claims that one thing will inevitably lead later to another, usually worse, state of affairs, without further argument or evidence. The first thing is rejected on the basis of not wanting the final state.

Activity 20

Make up an example of a Slippery Slope Fallacy for the following conclusions:

- ◆ The age at which people can legally drink should not be lowered.
- ◆ Scientists should not be allowed to engage in research on stem cells.
- ◆ Alcohol should not be advertised on television.
- ◆ Euthanasia should not be legalised.

Issues primarily relating to relevance:

Various ways in which the premises of an argument might be relevant to the conclusion were noted in the section on relevance. The main idea is that a premise is relevant if it provides a certain amount of justification for believing the conclusion. We previously recognised that arguments for analogy may suffer from issues of relevance if the similarities that are identified between the known and unknown entities are irrelevant to the conclusion being drawn. In this section we will look at two kinds of fallacious arguments that suffer from issues relating to relevance, **Ad Hominems** and **Appeals to Emotion**.

Ad Hominems:

Ad Hominems are informal fallacies, which are also known as 'Attacking the Person'. Ad Hominems fallacies are committed when someone rejects a particular claim on the basis of something about the person putting the claim forward rather than addressing the claim itself. The argument against the person occurs in three forms: the **Ad Hominem Abusive**, the **Ad Hominem Circumstantial**, and the **Tu Quoque**. In the **Ad Hominem Abusive**, the second person responds to the first person's argument by verbally abusing the first person. Ad hominem abusive arguments are prevalent in political debates. Here's one from Donald Trump, before he became the President of the USA:

"Look at that face!" Trump said about rival candidate Carly Fiorina in an interview with Rolling Stone in September 2015. "Can you imagine that, the face of our next president?! I mean, she's a woman, and I'm not supposed to say bad things, but really, folks, come on. Are we serious?" (Ad Hominem Abusive)

Rather than pushing back on Fiorina's ideas, experience, or policy proposals, Trump focused on her appearance — something that should be irrelevant to how capable she might be in the role of president.

A Circumstantial Ad Hominem is when one attempts to attack a claim by asserting that the person making the claim is making it simply out of self-interest. In some cases, this fallacy involves substituting an attack on a person's circumstances (such as the person's religion, political affiliation, ethnic background, etc.).

“I think that we should reject what Father Jones has to say about the ethical issues of abortion because he is a Catholic priest. After all, Father Jones is required to hold such views.” (Ad Hominem Circumstantial)

Ad hominem Tu Quoque is a type of ad hominem that attacks a person by focusing on their past words or actions instead of the truth of their current claims. In an Ad Hominem Tu Quoque the person's claims are attacked because they are not consistent with his or her current or past behaviour.

Ariande: “You should not be eating that... it has been scientifically proven that eating burgers are no good for your health.”

Barnaby: “You eat burgers all the time so that can’t be true.” (Tu Quoque)

In some cases of the Ad Hominem fallacy, such as the Ad Hominem Abusive example from Donald Trump, the particular aspects of the person are totally irrelevant to whether the claim is true or false. In less obvious cases there may be aspects of the person that do undermine the credibility of their testimony to an extent. In the example above, the Catholic priest would be expected to take a particular stance on abortion; however it would not be appropriate to reject everything they have to say about the issue just because that is the case.

Activity 21:

Construct ad hominem arguments against the following people:

- ◆ Politicians making a speech on the dangers of drug use.
- ◆ Teachers telling candidates to work harder.
- ◆ Tabloid newspapers accusing a politician of trying to stir up controversy.
- ◆ Doctors telling people that smoking is bad for your health.

Explain why these arguments are bad forms of reasoning.

Appeals to Emotion

This is a category of fallacies that uses emotion in place of reason in order to attempt to win the argument. It is a type of manipulation used in place of reasoning. It attempts to arouse the emotions of its audience in order to gain acceptance of its conclusion. The emotion may be one of many, e.g. pity, pride, fear, envy, hatred, etc.

Take this example:

“Luke didn’t want to eat his sheep’s brains with chopped liver and Brussels sprouts, but his father told him to think about poor starving children in the world who weren’t fortunate enough to have any food at all.”

Although this argument might make us feel bad about children who don’t have any food at all, Luke eating his sheep’s brains with chopped liver and Brussels sprouts will not have any impact on the children who don’t have any food. The fact that the children are starving is not relevant to whether Luke should eat his food or not. There are, however, some cases where appealing to emotion is appropriate. Take this example:

“You should bring me to the hospital, because I just broke my leg and it is really painful. I feel awful.”

This is not an inappropriate appeal to pity. It is really the case that you should take the person to the hospital and the fact that their legs hurts and they feel awful is relevant to this conclusion whether it appeals to your sense of pity or not.

Activity 22:

Explain why the following arguments involve issues to do with relevance:

- ◆ “There must be life after death, otherwise it’s just emptiness.”
- ◆ “Of course she didn’t do it. How can you believe that? You love her don’t you?”

Issues primarily relating to sufficiency:

An argument where the premises are sufficient is one where the premises are enough to engender a well-founded confidence in the conclusion. Arguments that are deductively valid have premises that are sufficient to prove the conclusion. With inductive arguments, inductive strength is a matter of degree and, however strong the argument, the conclusion is never guaranteed in the same way that it is with deductive reasoning. When it comes to conductive strength, although the premises will be assessed individually with regard to acceptability and relevance, they are considered together with regard to sufficiency and the addition of premises strengthens an argument whilst the removal of premises weakens an argument. We are going to look at 3 types of fallacy that have issues primarily relating to the sufficiency of the premises. These are the informal fallacy of post hoc ergo propter hoc and the formal fallacies of denying the antecedent and affirming the consequent.

Post Hoc Ergo Propter Hoc:

This informal fallacy is falsely assuming that because some event followed another that it was caused by the first event, i.e. that because x and y occur one after the other that the one causes the other, for example:

You do badly in an exam and later discover that you had forgotten to bring your lucky rabbit's foot and conclude you did badly because of forgetting the rabbit's foot.

The key idea here is that the fact you did badly after forgetting your lucky rabbit's foot is not sufficient evidence to assume that was why you did badly. Indeed there are many more plausible explanations, including that you did not work as hard as you could have prior to your exam.

Although the example above uses bad reasoning, there are cases where x is a plausible cause for y and so assuming x is the cause of y may be a reasonable inductive argument. For example, it might seem reasonable to think eating food after its best before date is a plausible cause of you feeling sick, especially if more than one person ate it and now feels unwell. So, whether or not we consider it a fallacy may depend on whether x being before y is offered as proof of it being the cause of y or as evidence of a causal connection between x and y.

Activity 23

Create arguments that commit the fallacy of **Post Hoc Ergo Propter Hoc** involving the following statements:

1. All humans are born; all humans die.
2. Spider Man's spider sense tingles; Spider Man gets into a fight.
3. The candidates sat the course; the candidates sat the exam.

that I got a flat tyre. The fact that I can imagine the conclusion being false whilst both premises are true demonstrates that this is an invalid argument.

Denying the Antecedent

This is an argument that has the form [if p then q],[not p], therefore [not q]. In this argument the second premise states that the antecedent of premise 1 is not true, which is where the name 'Denying the Antecedent' comes from.

Its structure is as follows:

P1 If P then Q
P2 Not P (*antecedent is denied*)
C Not Q

In this form of argument the assumption is made that because P is false, Q cannot be true. But the fact that (from the first premise) the truth of P guarantees the truth of Q does not mean that Q cannot be true unless P is. P is a sufficient condition for the truth of Q; it is not a *necessary* condition.

This is demonstrated in the following argument:

P1 If I get a flat tyre then I will be late for work.
P2 I did not get a flat tyre. (*antecedent is denied*)
C I will not be late for work.

The fact that I did not get a flat tyre does nothing whatsoever to establish that I was not late for work. As we know already, there are various other things that could have made me late. Again, the fact that I can imagine being late for work even though I did not get a flat tyre establishes that the argument is invalid - the premises can be true and the conclusion false.

Activity 25

For the following arguments, you should a) decide whether they are valid or invalid, b) If invalid say whether they are **denying the antecedent** or **affirming the consequent**, c) If invalid explain one reason why the conclusion could be false.

- a) P1 If one candidate gets swine flu then we will have to quarantine the school
P2 The school has been quarantined
C At least one candidate has swine flu.
- b) P1 If Simon Cowell says someone is going to be a pop star then they will be one.
P2 Cheryl Cole is a pop star.
C Simon Cowell said she was going to be a pop star.
- c) P1 If Simon Cowell says someone is going to be a pop star then they will one.
P2 Simon Cowell said that Leona Lewis would be a pop star.
C Leona Lewis is a pop star.
- d) P1 If you wear dungarees then you are cool.
P2 You are cool.
C You wear dungarees.
- e) P1 If you are caught chewing gum in school then you will get a detention.
P2 You were not caught chewing gum in the school.
C You will not get a detention.
- f) P1 If you think racism is funny then you have no sense of humour.
P2 You have a sense of humour.
C You don't think that racism is funny.
- g) P1 If you get squashed by an elephant then you will break some bones.
P2 You have not been squashed by an elephant.
C You have not broken any bones.
- h) P1 If you eat lots of carrots you will see well in the dark.
P2 You do not eat a lot of carrots.
C You do not see well in the dark.
- i) P1 If you eat a lot of carrots you will see well in the dark.
P2 You do not see well in the dark.
C You do not eat a lot of carrots.

Activities Answers:

Activity 2

1. It is an argument.
Conclusion: There should be a campaign to educate young people about the dangers of drinking.
2. Not an argument.
3. It is an argument.
Conclusion: Having a pet is good for you.
4. Not an argument.
5. It is an argument.
Conclusion: Everyone should study critical thinking.
6. It is an argument.
Conclusion: Some birds are not felines.
7. It is an argument.
Conclusion: It is difficult to justify imposing tight time limits on candidates in examinations.
8. It is an argument.
Conclusion: You should not give knives to young children.
9. It is an argument.
Conclusion: Cutting the interest rate will probably have no effect on the stock market this time round.
10. Not an argument.

Activity 3

- | | | |
|-------|----|--|
| a) | P1 | Pete is either English or Scottish. |
| | P2 | Pete is not English. |
| | C | Pete must be Scottish. |
| <hr/> | | |
| b) | P1 | Landfills are ugly and can smell very bad. |
| | P2 | These people did not choose to live next to a landfill. |
| | C | If the Government wants to create a landfill here they should compensate those who live in the area. |
| <hr/> | | |
| c) | P1 | Candidates who cram immediately before examinations usually get lower grades than those who do not. |
| | P2 | I'm not even going to open a book during the exam period. |
| | C | I should have a much better chance of doing well. |

- d) P1 If the suspect had been a stranger, Igor would have barked loudly when he came into the room to take the money Igor was guarding.
 P2 Igor didn't make any noise at all.
 C The suspect must be an acquaintance.
-
- e) P1 Darwin's theory of evolution is just a theory.
 P2 Theories are just speculation with no evidence behind them.
 P3 We don't want our children to learn theories with no evidence behind them.
 C We shouldn't allow the theory of evolution to be taught in school.
-
- f) P1 If each individual is unique, then to make them equal would be to destroy most of what is human in him.
 P2 We do not want to destroy what makes us most human.
 C There is no justification for equality in the nature of man.

Activity 4

- P1 An argument is valid if and only if there is no logically possible situation where all the premises are true and the conclusion is false at the same time.
 P2 This argument is valid and also has a false conclusion.
 C This argument must have at least one false premise.

Activity 5

1. Invalid
2. Valid
3. Valid
4. Valid
5. Valid
6. Valid
7. Valid
8. Invalid
9. Invalid
10. Valid

Activity 6

A sound argument guarantees a true conclusion because if it is sound then it is valid. A valid argument is one that is truth preserving, which means that if your premises are true then your conclusion must also be true. In a sound argument the premises have to be true, so this means that they guarantee that a true conclusion will follow.

Activity 7

2. State whether the following arguments are a) valid and b) sound.
- a) Valid but Unsound (probably – without checking if every politician is a liar or not we can't be sure, but it is reasonable to think that there are some that are not liars so the premises are not all true)
 - b) Invalid and so Unsound.
 - c) Invalid and so Unsound. (It is possible that the many talented actors don't overlap with the rich ones, although this may seem unlikely!)
 - d) Valid and Sound.
 - e) Valid and it is not clear whether it is sound or not. (Whether or not we think this is sound is debatable – this is because it is not an obvious matter of truth whether or not the conditions facing asylum seekers is inhumane or not. This means we cannot clearly state whether the second premise is true or false and so cannot determine the soundness of the argument.)
5. Are the following statements true or false? Why?
- a) All invalid arguments are unsound.
True – they must be both valid and true to be sound.
 - b) All true statements are valid.
False – validity is not applied to statements but to arguments.
 - c) To show that an argument is unsound, we must at least show that some of its premises are false.
False – we could also show that it was invalid.
 - d) An invalid argument must have a false conclusion.
False – it is possible to have an invalid argument with a true conclusion, it just may not be logically connected to the premises being presented.
 - e) If all the premises of a valid argument are false, then the conclusion must also be false.
False – we saw such an example when looking at validity –
If the moon was made of cheese it would have craters (False)
The moon is made of cheese (False)
The moon is made of craters (True)
 - f) If all the premises and the conclusion of an argument are true, then the argument is valid.
False – it could also be invalid.
 - g) All sound arguments are true.
False – only statement can be true or false, not arguments. Sound arguments have true premises and true conclusions.

Activity 8

Possible answers could be:

1. Women have a right to their body.
2. Traces of ammonia are a sign of life.
3. Things that do not harm anyone should be legal.
4. Lizards are reptiles.
5. If Creationism is not the best explanation for our observations then evolution is the best explanation for our observations.
6. The death penalty involves murder.
7. Having more red pieces makes candy bags better.
8. We should all drink things that are more natural and not processed.
9. You don't like walnuts.
10. This one needs 2 hidden premises to make it valid:
 You want to kiss someone
 Smoking causes bad breath.

Activity 9

1. P1 Sight is a reliable way to know what exists.
 IC If we see rocks, then they exist.
 P2 We can see rocks.
 C Rocks exist.
2. P1 Raj wants to audition for a local rock band.
 P2 He plays guitar but is also a good drummer.
 P3 The band play gigs all over the city.
 C Raj will need a car to transport his drum kit around with him to
 gigs.
 P4 Raj does not have enough money to buy a car.
 C It might be better if he auditioned on guitar.
3. P1 To stay healthy you are advised to have five portions of fresh
 fruit or vegetables each day.
 P2 You have only had four so far today.
 IC You should have a piece of fruit.
 P3 We only have apples and oranges.
 P4 You do not like oranges.
 C You should have an apple to maintain your good health.
4. P1 Coffee contains caffeine, which is a stimulant.
 P2 Taking any stimulant before going to bed stops you from
 sleeping soundly.
 C Drinking coffee before going to bed will stop you from sleeping
 soundly.

- P3 A poor night's sleep may lead you to feel tired in the morning.
 C Drinking coffee before going to bed may cause you to feel tired in the morning.

Activity 14

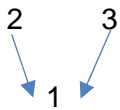
1. [Paris is in France] - 1, and [France is in Europe] - 2. So obviously [Paris is in Europe.] – 3

$$\begin{array}{r} 1+2 \\ \hline \downarrow \\ 3 \end{array}$$

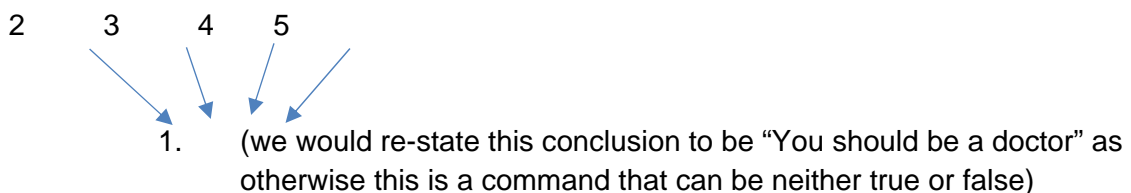
2. Since [the solution turned red when the indicator was added] - 1, I conclude [it is acidic] - 2, inasmuch as [acidic substances react with this indicator to form a red colour.] - 3

$$\begin{array}{r} 1+3 \\ \hline \downarrow \\ 2 \end{array}$$

3. [A life of crime is a poor career choice] - 1 because [sooner or later most criminals get caught] - 2 and [even if you were to get away with a crime you would eventually come to despise yourself for it.] – 3



4. [Be a doctor!]- 1 [You've got the talent] - 2, [you would enjoy the work] - 3, and [you could help a lot of people] - 4. Plus, [you could make a lot of money.] - 5

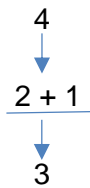


5. [All expensive things are desirable.] - 1 [All desirable things make you feel good.] - 2 [All things that make you feel good make you live longer.] - 3 So [all expensive things make you live longer.] – 4

$$\begin{array}{r} 1 + 2 + 3 \\ \hline \downarrow \\ 4 \end{array}$$

6. [We can see rocks.] – 1 [If we can see rocks, then they exist.] - 2 [Therefore, rocks exist.] - 3 [Sight is a reliable way to know what exists.] - 4 Therefore, [if we see rocks, then they

exist.] – 2 (note that this last statement is the same as the second sentence so we use the same number again and don't introduce a 5th number)



Activity 15

- P1 Earth and Eorpa are similar in that they both contain oxygen in their atmosphere.

P2 Earth supports life.

C Eorpa might also support life.
- P1 This novel is similar to the other one we read in respect of the plot.

P2 The other novel we read was very boring

C This novel will probably be very boring.
- P1 The governments campaign against illegal drug use is like a literal war in that there are shootings and bombings.

P2 You can't win a real war without shooting at the enemy.

C The government won't win the drug war without a "shoot on sight" order against drug dealers.

Activity 16

Evaluate these arguments from analogy:

- Although weather reports do not affect the weather, this is not the case with the media. The media does more than just reporting the facts, it can affect public opinion and thus moral standards. Here there is a relevant Disanalogy that has not been taken into account.
- There are many relevant ways in which a family is different from a society. First, the government officials need not be wiser than the citizens. Also, many parents might care for their children out of love and affection but government officials might not always have the interests of the people at heart.
- This is the basis of a very significant philosophical argument for the existence of God, called the Teleological Argument, or Design Argument. Hume argued that the analogy here was very weak. Whilst there are similarities between the world and the objects of human creation, there are many differences that are relevant which make it not a great analogy.

4. Although this looks like quite a strong argument, in that there are many similarities, the most relevant factor here is the fact that sharks are fish whilst dolphins are mammals. Whilst fish have gills for breathing, mammals have lungs.

Activity 18

1. There is an equivocation on 'wrong'. It is especially apparent in the claim "He was wrong, which means 'there was something wrong with him'." The word wrong is first used to refer to making a mistake, as in making an arithmetic error. The second use, in which it refers to something being wrong with a person, concerns a flaw in character of personality. Without confusing these two senses, one cannot arrive at the conclusion that this man is a flawed human being.
2. There is an equivocation on the idea of poems speaking for themselves. In the first statement, the meaning is clearly metaphorical; a poet who says that his poems will speak for themselves means that they do not require further explanation by him or by others. In the further statements, speaking for themselves is used with a different, literal meaning.
3. This is not an argument.
4. This is not an argument.
5. There is an equivocation in what is meant by "God." The proposition that "God exists in my mind" is referring to an idea and a belief within the speaker's mind. In the latter use the term God is used with the intent of referring to a real entity existing outside the mind.

Activity 22

- ◆ The fact that the alternative to life after death may be emptiness is irrelevant to whether or not there is actually life after death, whether or not it makes us feel bad to think that this may be so.
- ◆ This could be seen as an appeal to emotion, as loving someone may not be a relevant reason as to whether you believe they did or did not do a particular thing. There may be other reasons related to the fact that you love the person that are relevant, such as the fact that you trust them and know them very well, but this is not stated in the argument given.

Activity 23

Create arguments that commit the fallacy of *Post Hoc Ergo Propter Hoc* involving the following statements:

1. Before all humans die, they all have to be born.
Therefore, being born causes all humans to die.

2. Before Spider Man gets into a fight his spider sense tingles
Therefore, Spider man's spider senses tingling cause Spider Man to get into fights.
3. Before every student sits they exam they all sit the course
Therefore sitting the course causes the candidates to sit the exam.

Activity 25

- a) Invalid, Affirming the Consequent, If someone in the school contracted the ebola virus then the school would also need to be quarantined.
- b) Invalid, Affirming the Consequent, Cheryl Cole may have been discovered by someone else other than Simon Cowell.
- c) Valid
- d) Invalid, Affirming the Consequent, maybe you wear a "With Stupid" hat which would also make you cool!
- e) Invalid, Denying the Antecedent, You may be given a detention for not completing homework as well.
- f) Valid
- g) Invalid, Denying the Antecedent, You could have fallen in a skiing accident and broken a bone that way.
- h) Invalid, Denying the Antecedent, You may have night vision glasses to help see well in the dark.
- i) Valid

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