

Two Kinds of Reasoning



Time to look more closely at arguments—the kind that actually show something (unlike the red herrings and emotional appeals and other fallacies we are going to be talking about in a moment).

ARGUMENTS: GENERAL FEATURES

To repeat, an argument is used to support or prove a claim. This statement is *not* an argument:

God exists.

It's just a statement.

Likewise, *this* is not an argument:

God exists. That's as plain as the nose on your face.

It's just a slightly more emphatic statement.

Nor is this an argument:

When we evaluate a person's deeds, including those of a public official, we ordinarily use deductive arguments. When we surmise what an individual's future deeds will be, we ordinarily employ inductive arguments. Deduction and induction are explained in this chapter.

God exists, and if you don't believe it, you will go to hell.

It just tries to scare us into believing God exists.

Also not an argument:

God exists. There are no atheists in foxholes.

From a logical standpoint, these statements are not related.

Also not:

I think God exists, because I was raised a Baptist.

Yes, it looks a bit like an argument, but it isn't. It merely explains why I believe in God.

On the other hand, this *is* an argument:

God exists because something had to cause the universe.

The difference between this and the earlier examples? This example has a premise ("something had to cause the universe") that supports a conclusion ("God exists").

As we explained in Chapter 1 (see pages 10–15), an argument always has two parts: a premise part and a conclusion part. The premise part is used to establish the conclusion part.

This probably seems fairly straightforward, but there are one or two complications worth noting.

Conclusions Used as Premises

The same statement can be the conclusion of one argument and a premise in another argument:

Premise: The brakes aren't working, the engine burns oil, the transmission needs work, and the car is hard to start.

Conclusion 1: The car has outlived its usefulness.

Conclusion 2: We should get a new car.

In this example, the statement "The car has outlived its usefulness" is the conclusion of one argument, and it is also a premise in the argument that we should get a new car.

Clearly, if a premise in an argument is uncertain or controversial or has been challenged, you might want to defend it, that is, argue that it is true. When you do, the premise becomes the conclusion of a new argument. However, every chain of reasoning must begin somewhere. If we ask a speaker to defend each premise with a further argument, and each premise in that argument with a further argument, and so on and so on, we eventually find ourselves being unreasonable, much like four-year-olds who keep asking, "Why?" until they become exasperating. If we ask a speaker why he thinks the car has outlived its usefulness, he may mention that the car is hard to start. If we ask him why he thinks the car is hard to start, he probably won't know what to say.

In Depth

Conclusion Indicators

When the words in the following list are used in arguments, they usually indicate that a premise has just been offered and that a conclusion is about to be presented. (The three dots represent the claim that is the conclusion.)

Thus . . .	Consequently . . .
Therefore . . .	So . . .
Hence . . .	Accordingly . . .
This shows that . . .	This implies that . . .
This suggests that . . .	This proves that . . .

Example:

Stacy drives a Porsche. This suggests that either she is rich or her parents are.

The conclusion is

Either she is rich or her parents are.

The premise is

Stacy drives a Porsche.

Unstated Premises and Conclusions

Another complication is that arguments can contain unstated premises. For example,

Premise: You can't check out books from the library without an ID.

Conclusion: Bill won't be able to check out any books.

The unstated premise must be that Bill has no ID.

An argument can even have an unstated conclusion:

Example: The political party that best reflects mainstream opinion will win the presidency, and the Republican Party best reflects mainstream opinion.

If a person said this, he or she would be implying that the Republican Party will win the presidency; that would be the unstated conclusion of the argument.

Unstated premises are common in real life because sometimes they seem too obvious to need mentioning. The argument "the car is beyond fixing, so we should get rid of it" actually has an unstated premise to the effect that we should get rid of any car that is beyond fixing; but this may seem so obvious to us that we don't bother stating it.

Unstated conclusions also are not uncommon, though they are less common than unstated premises.

We'll return to this subject in a moment.

In Depth

Premise Indicators

When the words in the following list are used in arguments, they generally introduce premises. They often occur just *after* a conclusion has been given. A premise would replace the three dots in an actual argument.

Since . . .

Because . . .

For . . .

In view of . . .

This is implied by . . .

Example:

Either Stacy is rich or her parents are, since she drives a Porsche.

The premise is the claim that Stacy drives a Porsche; the conclusion is the claim that either Stacy is rich or her parents are.

TWO KINDS OF ARGUMENTS

To reprise what we said in the first chapter, good arguments come in two varieties: deductive demonstrations and inductive supporting arguments.

Deductive Arguments

The premise (or premises) of a good *deductive* argument, if true, *proves or demonstrates* (these being the same thing) its conclusion. However, there is more to this than meets the eye, and we must begin with the fundamental concept of deductive logic, *validity*. An argument is said to be **valid** if it isn't possible for the premise to be true and the conclusion false. This may sound complicated, but it really isn't. An example of a valid argument will help:

Premise: Jimmy Carter was president immediately before Bill Clinton, and George W. Bush was president immediately after Bill Clinton.

Conclusion: Jimmy Carter was president before George W. Bush.

As you can see, it's impossible for this premise to be true and this conclusion to be false. So, the argument is valid.

However, you may have noticed that the premise contains a mistake. Jimmy Carter was not president immediately before Bill Clinton. George H. W. Bush was president immediately before Bill Clinton. Nevertheless, even though the premise of the above argument is not true, the argument is still valid, because it isn't possible for the premise to be true and the conclusion

false. Another way to say this: If the premise *were* true, the conclusion *could not* be false—and that’s what “valid” means.

Now, when the premise of a valid argument *is* true, there is a word for it. In that case, the argument is said to be **sound**. Here is an example of a sound argument:

Premise: Bill Clinton is taller than George W. Bush, and Jimmy Carter is shorter than George W. Bush.

Conclusion: Therefore, Bill Clinton is taller than Jimmy Carter.

This argument is sound because it is valid and the premise is true. As you can see, if an argument is sound, then its conclusion has been proved.

Inductive Arguments

Again, the premise of a good deductive argument, if true, proves the conclusion. This brings us to the second kind of argument, the *inductive* argument. The premises of inductive arguments don’t prove their conclusions; they *support* them. For example: A woman has been found murdered. The husband is known to have threatened her repeatedly. That fact certainly does not prove that the woman’s husband murdered her. By itself, the fact barely even supports that conclusion. But it does support it slightly. It raises the probability slightly that the husband was the murderer. Certainly the investigators should question the husband closely if they learn he repeatedly threatened his wife before she died.

If you are thinking that support is a matter of degrees and that it can vary from just a little to a whole lot, you are right. If, say, the husband’s fingerprints had been found on the murder weapon, that fact would offer much better support for the conclusion that the husband was the murderer. That is, it would make it likelier that the woman’s murderer was her husband.

Inductive arguments are thus better or worse on a scale, depending on how much support their premises provide for the conclusion. Logicians have a technical word to describe this situation. The more support the premise of an inductive argument provides for the conclusion, the **stronger** the argument; the less support it provides, the **weaker** the argument. Put another way, the more likely the premise makes the conclusion, the stronger the argument; and the less likely, the weaker the argument. Discovering that the man repeatedly threatened his wife (that’s the premise) raises the probability slightly that it is he who was the murderer (that’s the conclusion). By comparison, discovering that his fingerprints are on the murder weapon raises the probability by a much larger jump: It is the stronger of the two arguments.

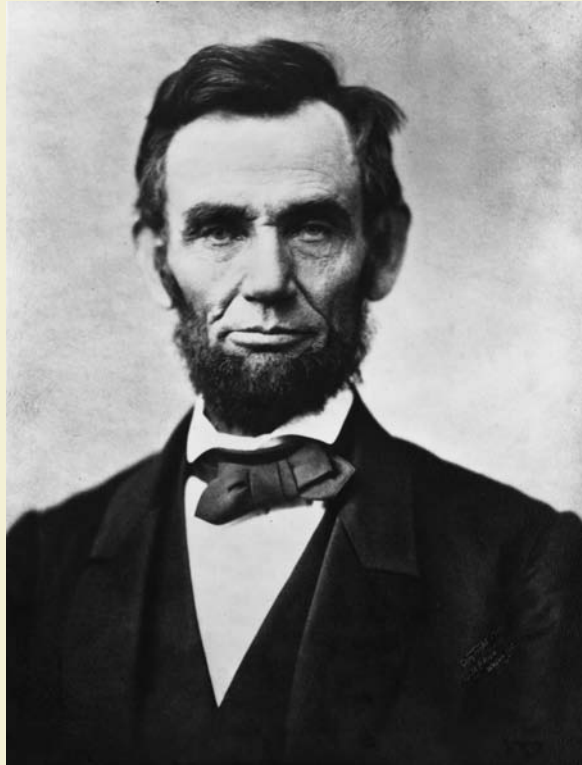
Many instructors use the word “strong” in an absolute sense to denote only those arguments whose premise gives the conclusion better than a 50-50 chance of being true. In this book, however, we use “strong” and “weak” in a comparative sense. Given two arguments for the same conclusion, the one whose premise makes the conclusion more likely is the stronger argument, and the other is the weaker.

These are a lot of concepts for you to remember, but you shouldn’t be surprised if your instructor asks you to do so. To make this task easier, let’s summarize everything to this point. Again, the two basic types of arguments

Real Life

Abe Lincoln Knew His Logic

Validity and Soundness in the Lincoln-Douglas Debates



Here's Abraham Lincoln speaking in the fifth Lincoln-Douglas debate:

I state in syllogistic form the argument:

Nothing in the Constitution . . . can destroy a right distinctly and expressly affirmed in the Constitution.

The right of property in a slave is distinctly and expressly affirmed in the Constitution.

Therefore, nothing in the Constitution can destroy the right of property in a slave.

Lincoln goes on to say:

There is a fault [in the argument], but the fault is not in the reasoning; but the falsehood in fact is a fault of the premises. I believe that the right of property in a slave is *not* distinctly and expressly affirmed in the Constitution.

In other words, the argument is valid, Lincoln says, but unsound and thus not a good argument.

Syllogisms, by the way, are covered in Chapter 8.



■ An important life decision like buying a house requires careful inductive reasoning about future earning power, job security, the economy, interest rates, family and health needs, and lifestyle goals. Mistakes (and bad luck) hurt.

are (1) those that offer deductive proof and (2) those that provide inductive support.

When we reason deductively, we try to *prove* or *demonstrate* a conclusion.

A deductive argument is said to be **valid** if it isn't possible for the premise to be true and the conclusion false. Further, if the premise of a valid argument is in fact true, the argument is said to be **sound**. The conclusion of a sound argument has been demonstrated.

When we reason inductively, we try to *support* a conclusion.

Inductive arguments are "stronger" or "weaker" depending on how much support the premise provides for the conclusion; that is, depending on how likely the premise makes the conclusion.

Beyond a Reasonable Doubt

In common law, the highest standard of proof is proof “beyond a reasonable doubt.” If you are a juror in a criminal trial, evidence will be presented to the court—facts that the interested parties consider relevant to the crime. Additionally, the prosecutor and counsel for the defense will offer arguments connecting the evidence to (or disconnecting it from) the guilt or innocence of the defendant. When the jury is asked to return a verdict, the judge will tell the jury that the defendant must be found not guilty unless the evidence proves guilt *beyond a reasonable doubt*.

Proof beyond a reasonable doubt actually is a somewhat lower standard than deductive proof. The latter corresponds more to what, in ordinary English, might be expressed by the phrase “beyond possible doubt.” Recall that in logic, a proposition has been proved when it has been shown to be the conclusion of a sound argument—an argument, that is, in which (1) all premises are true, and (2) it is impossible for the premises to be true and for the conclusion to be false. In this sense, many propositions people describe as having been proved, such as that smoking causes lung cancer or that the DNA found at a crime scene was the defendant’s, have not actually been proved in our sense of the word. So, in real life, when people say something has been proved, they may well be speaking “informally.” They may not mean that something is the conclusion of a sound argument. However, when we—the authors—say that something has been proved, that is *exactly* what we mean.

DEDUCTION, INDUCTION, AND UNSTATED PREMISES

Somebody announces, “Rain is on its way.” Somebody else asks how he knows. He says, “There’s a south wind.” Is the speaker trying to prove rain is coming? Probably not. His thinking, spelled out, is probably something like this:

Stated premise: The wind is from the south.

Unstated premise: Around here, south winds are usually followed by rain.

Conclusion: There will be rain.

In other words, the speaker was merely trying to show that rain was a good possibility.

Notice, though, that the unstated premise in the argument could have been a universal statement to the effect that a south wind *always* is followed by rain at this particular location, in which case the argument would be deductive:

Stated premise: The wind is from the south.

Unstated premise: Around here, a south wind is always followed by rain.

Conclusion: Rain is coming.

Spelled out this way, the speaker’s thinking is deductive: It isn’t possible for the premises to be true and the conclusion to be false. So, one might wonder abstractly what the speaker intended—an inductive argument that supports the belief that rain is coming, or a deductive proof.

There is, perhaps, no way to be certain short of asking the speaker something like, “Are you 100% positive?” But experience (“background knowledge”)

tells us that wind from a particular direction is not a surefire indicator of rain. So, probably the speaker did have in mind merely the first argument. He wasn't trying to present a 100% certain, knock-down proof that it would rain; he was merely trying to establish that there was a good chance of rain.

It isn't hard to turn an inductive argument with an unstated premise into a deductively valid argument by supplying a universal premise—a statement that something holds without exception or is true everywhere or in all cases. Is that what the speaker really has in mind, though? You just have to use background knowledge and common sense to answer the question.

For example, you overhear someone saying:

Stacy and Justin are on the brink of divorce. They're always fighting.

One could turn this into a valid deductive argument by adding to it the universal statement "Every couple fighting is on the brink of divorce." But such an unqualified universal statement seems unlikely. Probably the speaker wasn't trying to prove that Stacy and Justin are on the brink of divorce. He or she was merely trying to raise its likelihood.

Often it is clear that the speaker does have a *deductive* argument in mind and has left some appropriate premise unstated. You overhear Professor Greene saying to Professor Brown,

"Flunk her! This is the second time you've caught her cheating."

It would be very strange to think that Professor Greene is merely trying to make it more likely that Professor Brown should flunk the student. Indeed, it is hard even to make sense of that suggestion. Professor Greene's argument, spelled out, must be this:

Stated premise: This is the second time you've caught her cheating.

Unstated premise: Anyone who has been caught cheating two times should be flunked.

Conclusion: She should be flunked.

So, context and content often make it clear what unstated premise a speaker has in mind and whether the argument is deductive or inductive.

Unfortunately, though, this isn't always the case. We might hear someone say,

The bars are closed; therefore it is later than 2 A.M.

If the unstated premise in the speaker's mind is something like "In this city, the bars all close at 2 A.M.," then presumably he or she is thinking deductively and is evidently proffering proof that it's after 2. But if the speaker's unstated premise is something like "Most bars in this city close at 2 A.M." or "Bars in this city usually close at 2 A.M.," then we have an inductive argument that merely supports the conclusion. So, which is the unstated premise? We really can't say without knowing more about the situation or the speaker.

The bottom line is this. Real-life arguments often leave a premise unstated. One such unstated premise might make the argument inductive; another might make it deductive. Usually, context or content make reasonably clear what is intended; other times they may not. When they don't, the best practice is to attribute to a speaker an unstated premise that at least is believable, everything considered. We'll talk about believability in Chapter 4.

In the Media

Is an Ad Photo an Argument?



The short answer: No. The longer version: Still no. An advertising photograph can “give you a reason” for buying something only in the sense that it can *cause* you to think of a reason. A photo is not and cannot be an argument for anything.

TECHNIQUES FOR UNDERSTANDING ARGUMENTS

Before we can evaluate an argument, we must understand it. Many arguments are difficult to understand because they are spoken and go by so quickly we cannot be sure of the conclusion or the premises. Others are difficult to understand because they have a complicated structure. Still others are difficult to understand because they are embedded in nonargumentative material consisting of background information, prejudicial coloring, illustrations, parenthetical remarks, digressions, subsidiary points, and other window dressing. And some arguments are difficult to understand because they are confused or because the reasons they contain are so poor that we are not sure whether to regard them as reasons.

In understanding any argument, the first task is to find the conclusion—the main point or thesis of the passage. The next step is to locate the reasons

that have been offered for the conclusion—that is, to find the premises. Next, we look for the reasons, if any, given for these premises. To proceed through these steps, you have to learn both to spot premises and conclusions when they occur in spoken and written passages and to understand the interrelationships among these claims—that is, the structure of the argument.

Clarifying an Argument's Structure

Let's begin with how to understand the relationships among the argumentative claims, because this problem is sometimes easiest to solve. If you are dealing with written material that you can mark up, one useful technique is to number the premises and conclusions and then use the numbers to lay bare the structure of the argument. Let's start with this argument as an example:

I don't think we should get Carlos his own car. As a matter of fact, he is not responsible because he doesn't care for his things. And anyway, we don't have enough money for a car, since even now we have trouble making ends meet. Last week you yourself complained about our financial situation, and you never complain without really good reason.

We want to display the structure of this argument clearly. First, circle all premise and conclusion indicators. Thus:

I don't think we should get Carlos his own car. As a matter of fact, he is not responsible (because) he doesn't care for his things. And anyway, we don't have enough money for a car, (since) even now we have trouble making ends meet. Last week you yourself complained about our financial situation, and you never complain without really good reason.

Next, bracket each premise and conclusion, and number them consecutively as they appear in the argument. So, what we now have is this:

① [I don't think we should get Carlos his own car.] As a matter of fact, ② [he is not responsible] because ③ [he doesn't care for his things.] And anyway, ④ [we don't have enough money for a car], since ⑤ [even now we have trouble making ends meet.] ⑥ [Last week you yourself complained about our financial situation], and ⑦ [you never complain without really good reason.]

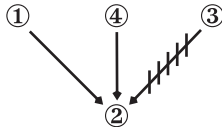
And then we diagram the argument. Using an arrow to mean "therefore" or "is intended as evidence [or as a reason or as a premise] for," we diagram the first three claims in the argument as follows:



Frequently, too, we evaluate counterarguments to our positions. For example:

- ① We really should have more African Americans on the faculty.
- ② That is why the new diversity program ought to be approved.
- True, ③ it may involve an element of unfairness to whites, but
- ④ the benefits to society of having more black faculty outweigh the disadvantages.

Notice that claim ③ introduces a consideration that runs counter to the conclusion of the argument, which is stated in ②. We can indicate counterclaims by crossing the “therefore” arrow with lines, thus:



This diagram indicates that item ③ has been introduced by the writer as a consideration that runs counter to ②.

Of course, one might adopt other conventions for clarifying argument structure—for example, circling the main conclusion and drawing solid lines under supporting premises and wavy lines under the premises of subarguments. The technique we have described is simply one way of doing it; any of several others might work as well for you. However, *no* technique for revealing argument structure will work if you cannot spot the argumentative claims in the midst of a lot of background material.

Distinguishing Arguments from Window Dressing

It is not always easy to isolate the argument in a speech or a written piece. Often, speakers and writers think that because their main points are more or less clear to them, they will be equally apparent to listeners and readers. But it doesn't always work that way.

If you have trouble identifying a conclusion in what you hear or read, it *could* be the passage is not an argument at all. Make sure the passage in question is not a report, a description, an explanation, or something else altogether, rather than an argument. The key here is determining whether the speaker or writer is offering reasons intended to support or demonstrate one or more claims.

The problem could also be that the conclusion is left unstated. Sometimes it helps simply to put the argument aside and ask yourself, “What is this person trying to prove?” In any case, the first and essential step in understanding an argument is to spot the conclusion.

If you are having difficulty identifying the *premises*, consider the possibility that you have before you a case of rhetoric (see Chapter 5). (You can't find premises in a piece of pure rhetoric because there *are* no premises.) You will have an advantage over many students in having learned about rhetorical devices in Chapters 5, 6, and 7. By that time, you should be getting pretty good at recognizing them.

As you apply what you learn in this book to arguments you encounter in real life, you are apt to encounter arguments and argumentative essays whose

On Language

Stupid Liberal!

The employer introduced himself to his new gardener.

"I am a professor of logic," the employer said.

"Oh. What's that?" the gardener asked.

"I shall give you a demonstration," announced the professor. "Do you own a wheelbarrow?"

"Yes," replied the gardener.

"Then I infer you are a hard worker," the professor continued. "And from that fact I infer you have a family. And from that I infer you are conscientious and responsible. And from that I infer you are a conservative. Am I right?"

"Wow!" exclaimed the gardener. "That's right! So that's logic?"

"That's logic," preened the professor.

Later the gardener met up with one of his buddies and told him he had a job with a professor of logic.

"Logic?" his friend asked. "What's that?"

"I'll show you," the gardener said. "Do you own a wheelbarrow?"

"No."

"Stupid liberal."

organization is difficult to comprehend. When you do, you may find diagramming a useful technique. We also suggest that you attempt to diagram your own essays—if you find that you have difficulty, it is a good indication that you need to reorganize your essay and make the structure of your reasoning clearer.

EVALUATING ARGUMENTS

Thinking critically requires us to evaluate arguments, and evaluating arguments has two parts. First, there is the *logic* part: Does the argument either demonstrate or support its conclusion? Is this argument either deductively valid or inductively relatively strong? You know now what these questions mean theoretically; over the course of this book, you will see what they involve in fact.

The other part, of course, is the *truth* part. Are the premises actually true? As we explain in Chapter 4, it is best to be suspicious of a premise that conflicts with our background information or other credible claims, as well as a premise that comes from a source that lacks credibility. And, as we develop at length in Chapters 5, 6, and 7, we want to avoid being tricked into accepting a claim by rhetoric or other psychological gimmickry. It also almost goes without saying that premises that are unclear require clarification before one accepts them—as we explain in Chapter 3. In general, determining the truth of premises requires knowledge, experience, a level head, and the inclination to look into things.

The main ideas of the chapter are these:

- Arguments consist of a premise (or premises) and a conclusion.
- The same claim can be a premise in one argument and a conclusion in a second argument.
- The two fundamental types of reasoning are deductive demonstration and inductive support.
- A deductive argument is used to demonstrate or prove a conclusion, which it does if it is sound.
- An argument is sound if it is valid and its premise (or premises) is true.
- An argument is valid if it is impossible for its premise (or premises) to be true and its conclusion to be false.
- An inductive argument is used to support rather than to demonstrate a conclusion.
- Support is a matter of degrees: An argument supports a conclusion to the extent its premise (or premises) makes the conclusion likely.
- An argument that offers more support for a conclusion is said to be stronger than one that offers less support; the latter is said to be weaker than the former.
- Some instructors use the word “strong” in an absolute sense to denote inductive arguments whose premise (or premises) makes the conclusion probable.
- Inductive arguments and deductive arguments can have unstated premises.
- Whether an argument is deductive or inductive may depend on what the unstated premise is said to be.
- If you have trouble tracking the part of an argument that appears in a written passage, try diagramming the passage.

Recap

Exercise 2-1

Fill in the blanks where called for, and answer true or false where appropriate.

- ▲ 1. Arguments that are relatively strong or weak are called _____ arguments.
- 2. All valid arguments are sound arguments.
- 3. All sound arguments are valid arguments.
- ▲ 4. If a valid argument has a false conclusion, then not all its premises can be true.
- 5. A sound argument cannot have a false conclusion.
- 6. “Strong” and “weak” are absolute terms.
- ▲ 7. If you try to demonstrate or prove a conclusion, you are using _____ reasoning.

Exercises

8. When a conclusion has been proved beyond a reasonable doubt, it has been demonstrated.
9. An argument can never have an unstated conclusion.
- ▲ 10. When you try to support a conclusion, you are using _____ reasoning.

Exercise 2-2

Indicate which blanks would ordinarily contain premises and which would ordinarily contain conclusions.

- ▲ 1. ___ a ___, and ___ b ___. Therefore, ___ c ___.
- ▲ 2. ___ a ___. So, since ___ b ___, ___ c ___.
- ▲ 3. ___ a ___, because ___ b ___.
- ▲ 4. Since ___ a ___ and ___ b ___, ___ c ___.
- ▲ 5. ___ a ___. Consequently, ___ b ___, since ___ c ___ and ___ d ___.

Exercise 2-3

Identify the premises and conclusions in each of the following arguments.

- ▲ 1. Since all Communists are Marxists, all Marxists are Communists.
2. The Lakers almost didn't beat the Kings. They'll never get past Dallas.
3. If the butler had done it, he could not have locked the screen door. Therefore, since the door was locked, we know the butler is in the clear.
- ▲ 4. That cat is used to dogs. Probably she won't be upset if you bring home a new dog for a pet.
5. Hey, he can't be older than his mother's daughter's brother. His mother's daughter has only one brother.
6. Moscone will never make it into the state police. They have a weight limit, and he's over it.
- ▲ 7. Presbyterians are not fundamentalists, but all born-again Christians are. So, no born-again Christians are Presbyterians.
8. I guess he doesn't have a thing to do. Why else would he waste his time watching daytime TV?
9. "There are more injuries in professional football today than there were twenty years ago," he reasoned. "And if there are more injuries, then today's players suffer higher risks. And if they suffer higher risks, then they should be paid more. Consequently, I think today's players should be paid more," he concluded.
- ▲ 10. Let's see . . . since the clunk comes only when I pedal, the problem must be in the chain, the crank, or the pedals.

Exercise 2-4

Identify the premises and the conclusions in the following arguments.

- ▲ 1. The darned engine pings every time we use the regular unleaded gasoline, but it doesn't do it with super. I'd bet that there is a difference in the octane ratings between the two in spite of what my mechanic says.
- 2. Chances are I'll be carded at JJ's, since Kera, Sherry, and Bobby were all carded there, and they all look as though they're about thirty.
- 3. Seventy percent of freshmen at State College come from wealthy families; therefore, probably about the same percentage of all State College students come from wealthy families.
- ▲ 4. When blue jays are breeding, they become aggressive. Consequently, scrub jays, which are very similar to blue jays, can also be expected to be aggressive when they're breeding.
- 5. I am sure Marietta comes from a wealthy family. She told me her parents benefited from the cut in the capital gains tax.
- 6. According to *Nature*, today's thoroughbred racehorses do not run any faster than their grandparents did. But human Olympic runners are at least 20 percent faster than their counterparts of fifty years ago. Most likely, racehorses have reached their physical limits but humans have not.
- ▲ 7. Dogs are smarter than cats, since it is easier to train them.
- 8. "Let me demonstrate the principle by means of logic," the teacher said, holding up a bucket. "If this bucket has a hole in it, then it will leak. But it doesn't leak. Therefore, obviously, it doesn't have a hole in it."
- 9. We shouldn't take a chance on this new candidate. She's from Alamo Polytech, and the last person we hired from there was rotten.
- ▲ 10. If she was still interested in me, she would have called, but she didn't.

Exercise 2-5

Five of these items are intended to be deductive demonstrations, and five are intended to provide inductive support. Which are which?

- ▲ 1. No mayten tree is deciduous, and all nondeciduous trees are evergreens. It follows that all mayten trees are evergreens.
- 2. Mike must belong to the Bartenders and Beverage Union Local 165, since almost every Los Vegas bartender does.
- 3. Either Colonel Mustard or Reverend Green killed Professor Plum. But whoever ran off with Mrs. White did not kill the professor. Since Reverend Green ran off with Mrs. White, Colonel Mustard killed Professor Plum.
- ▲ 4. I've never met a golden retriever with a nasty disposition. I bet there aren't any.
- 5. Since some grapes are purple, and all grapes are fruit, some fruit is purple.
- 6. Why is Sarah so mean to Janice? The only thing I can think of is that she's jealous. Jealousy is what's making her mean.

- ▲ 7. Obama will make a fine president. After all, he made a fine senator.
- 8. The figure he drew has only three sides, so it isn't a square.
- 9. It was the pizza that made my stomach churn. What else could it be? I was fine until I ate it.
- ▲ 10. It's wrong to hurt someone's feelings, and that is exactly what you are doing when you speak to me like that.

Exercise 2-6

Some of these passages are best viewed as attempted deductive demonstrations, and others are best viewed as offering inductive support. Which are which?

- ▲ 1. All mammals are warm-blooded creatures, and all whales are mammals. Therefore, all whales are warm-blooded creatures.
- ▲ 2. The brains of rats raised in enriched environments with a variety of toys and puzzles weigh more than the brains of rats raised in more barren environments. Therefore, the brains of humans will weigh more if humans are placed in intellectually stimulating environments.
- 3. Jones won't plead guilty to a misdemeanor, and if he won't plead guilty, then he will be tried on a felony charge. Therefore, he will be tried on a felony charge.
- ▲ 4. We've interviewed two hundred professional football players, and 60 percent of them favor expanding the season to twenty games. Therefore, 60 percent of all professional football players favor expanding the season to twenty games.
- 5. John is taller than Bill, and Bill is taller than Margaret. Therefore, John is taller than Margaret.
- 6. Exercise may help chronic male smokers kick the habit, says a study published today. The researchers, based at McDuff University, put thirty young male smokers on a three-month program of vigorous exercise. One year later, only 14 percent of them still smoked, according to the report. An equivalent number of young male smokers who did not go through the exercise program were also checked after a year, and it was found that 60 percent still smoked. Smokers in the exercise program began running three miles a day and gradually worked up to eight miles daily. They also spent five and a half hours each day in such moderately vigorous activities as soccer, basketball, biking, and swimming.
- ▲ 7. Believe in God? Yes, of course I do. The universe couldn't have arisen by chance, could it? Besides, I read the other day that more and more physicists believe in God, based on what they're finding out about the Big Bang and all that stuff.
- ▲ 8. From an office memo: "I've got a good person for your opening in Accounting. Jesse Brown is his name, and he's as sharp as they come. Jesse has a solid background in bookkeeping, and he's good with computers. He's also reliable, and he'll project the right image. He will do a fine job for you."

Exercise 2-7

Some of these passages contain separate arguments for the main conclusion. Others contain a single argument (though it might have more than one premise). Which passages contain separate arguments for the main conclusion?

- ▲ 1. North Korea is a great threat to its neighbors. It has a million-person army ready to be unleashed at a moment's notice, and it also has nuclear weapons.
- 2. Jim is going to the party with Mary, so she won't be going alone.
- 3. Mike should just go ahead and get a new car. The one he's driving is ready to fall apart; also, he has a new job and can afford a new car.
- 4. If Parker goes to Las Vegas, he'll wind up in a casino; and if he winds up in a casino, it's a sure thing he'll spend half the night at a craps table. So, you can be sure: If Parker goes to Las Vegas, he'll spend half the night at a craps table.
- 5. It's going to be rainy tomorrow, and Moore doesn't like to play golf in the rain. It's going to be cold as well, and he *really* doesn't like to play when it's cold. So, you can be sure Moore will be someplace other than the golf course tomorrow.
- ▲ 6. Hey, you're overwatering your lawn. See? There are mushrooms growing around the base of that tree—a sure sign of overwatering. Also, look at all the worms on the ground. They come up when the earth is oversaturated.
- 7. "Will you drive me to the airport?" she asked. "Why should I do that?" he wanted to know. "Because I'll pay you twice what it takes for gas. Besides, you said you were my friend, didn't you?"
- 8. If you drive too fast, you're more likely to get a ticket, and the more likely you are to get a ticket, the more likely you are to have your insurance premiums raised. So, if you drive too fast, you are more likely to have your insurance premiums raised.
- ▲ 9. If you drive too fast, you're more likely to get a ticket. You're also more likely to get into an accident. So you shouldn't drive too fast.
- ▲ 10. There are several reasons why you should consider installing a solarium. First, you can still get a tax credit. Second, you can reduce your heating bill. Third, if you build it right, you can actually cool your house with it in the summer.
- 11. From a letter to the editor: "By trying to eliminate Charles Darwin from the curriculum, creationists are doing themselves a great disservice. When read carefully, Darwin's discoveries only support the thesis that species change, not that they evolve into new species. This is a thesis that most creationists can live with. When read carefully, Darwin actually supports the creationist point of view."
- 12. Editorial comment: "The Supreme Court's ruling, that schools may have a moment of silence but not if it's designated for prayer, is sound. Nothing stops someone from saying a silent prayer at school or anywhere else. Also, even though a moment of silence will encourage prayer, it will not favor any particular religion over any other. The ruling makes sense."

- ▲ 13. We must paint the house now! Here are three good reasons: (a) If we don't, then we'll have to paint it next summer; (b) if we have to paint it next summer, we'll have to cancel our trip; and (c) it's too late to cancel the trip.

Exercise 2-8

Which five of the following statements are probably intended to explain the cause of something, and which five are probably intended to argue that some claim is true?

- ▲ 1. The reason we've had so much hot weather recently is that the jet stream is unusually far north.
- 2. The reason Ms. Mossbarger looks so tired is that she hasn't been able to sleep for three nights.
- 3. The reason it's a bad idea to mow the lawn in your bare feet is that you could be seriously injured.
- ▲ 4. The reason Ken mows the lawn in his bare feet is that he doesn't realize how dangerous it is.
- 5. You can be sure that Ryan will marry Beth. After all, he told me he would.
- 6. If I were you, I'd change before going into town. Those clothes look like you slept in them.
- ▲ 7. Overeating can cause high blood pressure.
- 8. Eating so much salt can cause high blood pressure, so you'd better cut back a little.
- ▲ 9. It's a good bet the Saddam Hussein regime wanted to build nuclear weapons, because the U.N. inspectors found devices for the enrichment of plutonium.
- 10. The reason Saddam wanted to build nuclear weapons was to give him the power to control neighboring Middle Eastern countries.

Exercise 2-9

Which of the following items are (a) true beyond any possible doubt, (b) true beyond a reasonable doubt, or (c) neither of the above? Expect disagreement on some items.

- ▲ 1. Squares have four sides.
- 2. You will not live to be 130 years old.
- 3. A cow cannot yodel.
- ▲ 4. A six-foot person is taller than a five-foot person.
- 5. If the sign on the parking meter says, "Out of Order," the meter won't work.
- 6. Nobody can be her own mother.
- ▲ 7. God exists or does not exist.

8. They will never get rid of all disease.
9. The ice caps couldn't melt entirely.
- ▲ 10. The day two days after the day before yesterday is today.

Exercise 2-10

For each of the following, supply a universal principle (a statement that says that something holds without exception) that turns it into a valid deductive argument.

Example

Sarah is opinionated. She should be more open-minded.

One universal principle that makes it valid

Opinionated people should all be more open-minded. (Note: There are alternative ways of phrasing this.)

- ▲ 1. Jamal keeps his word, so he is a man of good character.
2. Betty got an A in the course, so she must have received an A on the final.
3. Iraq posed a threat to us, so we had a right to invade it.
- ▲ 4. Colonel Mustard could not have murdered Professor Plum, because the two men were in separate rooms at the time the professor was killed.
5. Melton is a liberal, since he voted against gun control.
6. Gelonik has a gentle soul; if there is a heaven, he should go to it when he dies.
- ▲ 7. Of course that guy should be executed; he committed murder, didn't he?
8. I don't think you could call the party a success; only eight people showed up.
9. Mzbrynski proved Goldbach's conjecture; that makes him the greatest mathematician ever.
- ▲ 10. The fan needs oil; after all, it's squeaking.

Exercise 2-11

For each of the following arguments, supply a principle that makes it inductive rather than deductive.

Example

Susan is sharp, so she will get a good grade in this course.

One claim that makes it inductive

Most sharp people get good grades in this course.

- ▲ 1. There are puddles everywhere; it must have rained recently.
2. The lights are dim; therefore, the battery is weak.

3. Simpson's blood matched the blood on the glove found at the victim's condo: He killed her.
- ▲ 4. Of course it will be cold tomorrow! It's been cold all week, hasn't it?
5. Melton was a great senator. It only stands to reason he would be a great president.
6. The dog has either fleas or dry skin; it's scratching a lot.
- ▲ 7. Why do I say their party wasn't a success? Remember all the leftovers?
8. Gelonik owns a rifle; he's sure to belong to the NRA.
9. The dessert contained caffeine, so you might have trouble sleeping tonight.
- ▲ 10. I took Zicam, and my cold disappeared like magic. Obviously, it works.

Exercise 2-12

Diagram the following "arguments," using the method explained in the text.

- ▲ 1. ①, because ② and ③. [Assume that ② and ③ are part of the same argument for ①.]
2. ① and ②; therefore ③. [Assume that ① and ② are separate arguments for ③.]
3. Since ①, ②; and since ③, ④. And since ② and ④, ⑤. [Assume that ② and ④ are separate arguments for ⑤.]
- ▲ 4. ①; therefore ② and ③. But because ② and ③, ④. Consequently, ⑤. Therefore, ⑥. [Assume ② and ③ are separate arguments for ④.]
5. ①, ②, ③; therefore ④. ⑤, in view of ①. And ⑥, since ②. Therefore ⑦. [Assume ①, ②, and ③ are part of the same argument for ④.]

Exercise 2-13

Diagram the arguments contained in the following passages, using the method explained in the text.

- ▲ 1. Dear Jim,
 Your distributor is the problem. Here's why. There's no current at the spark plugs. And if there's no current at the plugs, then either your alternator is shot or your distributor is defective. But if the problem were in the alternator, then your dash warning light would be on. So, since the light isn't on, the problem must be in the distributor. Hope this helps.
 Yours,
 Benita Autocraft
2. The slide in the dollar must be stopped. It contributes to inflation and increases the cost of imports. True, it helps exports, but on balance it is bad for the economy.
3. It's high time professional boxing was outlawed. Boxing almost always leads to brain damage, and anything that does that ought to be done away with. Besides, it supports organized crime.

- ▲ 4. They really ought to build a new airport. It would attract more business to the area, not to mention the fact that the old airport is overcrowded and dangerous.
- 5. Vote for Kucinich? No way. He's too radical, and he's too inexperienced, and those two things make him dangerous. I do like his stand on trade, but I still don't think you should vote for him.

Exercise 2-14

Diagram the arguments contained in the following passages, using the method explained in the text. (Your instructor may have different instructions for you to follow.)

- ▲ 1. Cottage cheese will help you to be slender, youthful, and more beautiful. Enjoy it often.
- 2. If you want to listen to loud music, do it when we are not at home. It bothers us, and we're your parents.
- 3. If you want to see the best version of *The Three Musketeers*, try the 1948 version. Lana Turner is luscious; Vincent Price is dastardly; Angela Lansbury is exquisitely regal; and nobody ever has or ever will portray D'Artagnan with the grace, athleticism, or skill of Gene Kelly. Rent it. It's a must.
- ▲ 4. From a letter to the editor: "The idea of a free press in America today is a joke. A small group of people, the nation's advertisers, control the media more effectively than if they owned it outright. Through fear of an advertising boycott, they can dictate everything from programming to news report content. Politicians as well as editors shiver in their boots at the thought of such a boycott. This situation is intolerable and ought to be changed. I suggest we all listen to National Public Radio and public television."
- 5. Too many seniors, disabled veterans, and families with children are paying far too much of their incomes for housing. Proposition 168 will help clear the way for affordable housing construction for these groups. Proposition 168 reforms the outdated requirement for an election before affordable housing can even be approved. Requiring elections for every publicly assisted housing venture, even when there is no local opposition, is a waste of taxpayers' money. No other state constitution puts such a roadblock in front of efforts to house senior citizens and others in need. Please support Proposition 168.
- 6. More than forty years after President John F. Kennedy's assassination, it's no easier to accept the idea that a loser like Lee Harvey Oswald committed the crime of the century all by himself with a \$12.78 mail-order rifle and a \$7.17 scope. Yet even though two-thousand-plus books and films about the episode have been made, there is no credible evidence to contradict the Warren Commission finding that "the shots which killed President Kennedy and wounded Governor Connally were fired by Lee Harvey Oswald" and that "Oswald acted alone."

After all these years, it's time to accept the conclusion. The nation pays a heavy price for chronic doubts and mistrust. Confidence in the

government has declined. Participation in the voting process has steadily slid downward. The national appetite for wild theories encourages peddlers to persist. Evil is never easy to accept. In the case of JFK, the sooner we let it go, the better.

- ▲ 7. “Consumers ought to be concerned about the Federal Trade Commission’s dropping a rule that supermarkets must actually have in stock the items they advertise for sale. While a staff analysis suggests costs of the rule outweigh the benefits to consumers, few shoppers want to return to the practices that lured them into stores only to find the advertised products they sought were not there.

“The staff study said the rule causes shoppers to pay \$200 million to receive \$125 million in benefits. The cost is a low estimate and the benefits a high estimate, according to the study.

“However, even those enormously big figures boil down to a few cents per shopper over a year’s time. And the rule does say that when a grocer advertises a sale, the grocer must have sufficient supply of sale items on hand to meet reasonable buyer demand.”

— The Oregonian

- 8. “And we thought we’d heard it all. Now the National Rifle Association wants the U.S. Supreme Court to throw out the ban on private ownership of fully automatic machine guns.

“As the nation’s cities reel under staggering murder totals, as kids use guns simply to get even after feuds, as children are gunned down by random bullets, the NRA thinks it is everybody’s constitutional right to have their own personal machine gun.

“This is not exactly the weapon of choice for deer hunting or for a homeowner seeking protection. It is an ideal weapon for street gangs and drug thugs in their wars with each other and the police.

“To legalize fully automatic machine guns is to increase the mayhem that is turning this nation—particularly its large cities—into a continual war zone. Doesn’t the NRA have something better to do?”

— Capital Times, *Madison, Wisconsin*

- 9. From a letter to the editor: “Recently the California Highway Patrol stopped me at a drunk-drive checkpoint. Now, I don’t like drunk drivers any more than anyone else. I certainly see why the police find the checkpoint system effective. But I think our right to move about freely is much more important. If the checkpoint system continues, then next there will be checkpoints for drugs, seat belts, infant car seats, drivers’ licenses. We will regret it later if we allow the system to continue.”

- ▲ 10. “Well located, sound real estate is the safest investment in the world. It is not going to disappear, as can the value of dollars put into savings accounts. Neither will real estate values be lost because of inflation. In fact, property values tend to increase at a pace at least equal to the rate of inflation. Most homes have appreciated at a rate greater than the inflation rate (due mainly to strong buyer demand and insufficient supply of newly constructed homes).”

— Robert Bruss, *The Smart Investor’s Guide to Real Estate*

11. “The constitutional guarantee of a speedy trial protects citizens from arbitrary government abuse, but it has at least one other benefit, too. It prevents crime.

“A recent Justice Department study found that more than a third of those with serious criminal records—meaning three or more felony convictions—are arrested for new offenses while free on bond awaiting federal court trial. You don’t have to be a social scientist to suspect that the longer the delay, the greater the likelihood of further violations. In short, overburdened courts mean much more than justice delayed; they quite literally amount to the infliction of further injustice.”

— *Scripps Howard Newspapers*

- ▲ 12. As we enter a new decade, about 200 million Americans are producing data on the Internet as rapidly as they consume it. Each of these users is tracked by technologies ever more able to collate essential facts about them—age, address, credit rating, marital status, etc.—in electronic form for use in commerce. One Web site, for example, promises, for the meager sum of seven dollars, to scan “over two billion records to create a single comprehensive report on an individual.” It is not unreasonable, then, to believe that the combination of capitalism and technology poses a looming threat to what remains of our privacy.

— *Loosely adapted from Harper's*

13. Having your car washed at the car wash may be the best way to go, but there are some possible drawbacks. The International Carwashing Association (ICA) has fought back against charges that automatic car washes, in recycling wash water, actually dump the salt and dirt from one car onto the next. And that brushes and drag cloths hurt the finish. Perhaps there is some truth to these charges.

The ICA sponsored tests that supposedly demonstrated that the average home car wash is harder on a car than an automatic wash. Maybe. But what’s “the average” home car wash? And you can bet that the automatic car washes in the test were in perfect working order.

There is no way you or I can tell for certain if the filtration system and washing equipment at the automatic car wash are properly maintained. And even if they are, what happens if you follow some mud-caked pickup through the wash? Road dirt might still be caught in the bristles of the brushes or strips of fabric that are dragged over your car.

Here’s my recommendation: Wash your own car.

- ▲ 14. **Argument in Favor of Measure A**

“Measure A is consistent with the City’s General Plan and City policies directing growth to the City’s non-agricultural lands. A ‘yes’ vote on Measure A will affirm the wisdom of well-planned, orderly growth in the City of Chico by approving an amendment to the 1982 Rancho Arroyo Specific Plan. Measure A substantially reduces the amount of housing previously approved for Rancho Arroyo, increases the number of parks and amount of open space, and significantly enlarges and enhances Bidwell Park.

“A ‘yes’ vote will accomplish the following: • Require the development to dedicate 130.8 acres of land to Bidwell Park • Require the

developer to dedicate seven park sites • Create 53 acres of landscaped corridors and greenways • Preserve existing arroyos and protect sensitive plant habitats and other environmental features • Create junior high school and church sites • Plan a series of villages within which, eventually, a total of 2,927 residential dwelling units will be developed • Plan area which will provide onsite job opportunities and retail services. . . .”

— *County of Butte sample ballot*

15. Rebuttal to Argument in Favor of Measure A

“Villages? Can a project with 3,000 houses and 7,000 new residents really be regarded as a ‘village’? The Sacramento developers pushing the Rancho Arroyo project certainly have a way with words. We urge citizens of Chico to ignore their flowery language and vote no on Measure A.

“These out-of-town developers will have you believe that their project protects agricultural land. Hogwash! Chico’s Greenline protects valuable farmland. With the Greenline, there is enough land in the Chico area available for development to build 62,000 new homes. . . .

“They claim that their park dedications will reduce use of our overcrowded Bidwell Park. Don’t you believe it! They want to attract 7,000 new residents to Chico by using Rancho Arroyo’s proximity to Bidwell Park to outsell other local housing projects.

“The developers imply that the Rancho Arroyo project will provide a much needed school site. In fact, the developers intend to sell the site to the school district, which will pay for the site with taxpayers’ money.

“Chico doesn’t need the Rancho Arroyo project. Vote no on Measure A.”

— *County of Butte sample ballot*

16. Letter to the editor: “A relative of mine is a lawyer who recently represented a murderer who had already had a life sentence and broke out of prison and murdered someone else. I think this was a waste of the taxpayers’ money to try this man again. It won’t do any good. I think murderers should be executed.

“We are the most crime-ridden society in the world. Someone is murdered every 27 minutes in the U.S., and there is a rape every ten minutes and an armed robbery every 82 seconds. According to the FBI, there are 870,000 violent crimes a year, and you know the number is increasing.

“Also according to the FBI, only 10 percent of those arrested for the crimes committed are found guilty, and a large percentage are released on probation. These people are released so they can just go out and commit more crimes.

“Why are they released? In the end it is because there aren’t enough prisons to house the guilty. The death sentence must be restored. This would create more room in prisons. It would also drastically reduce the number of murders. If a robber knew before he shot someone that if he was caught his own life would be taken, would he do it?

“These people deserve to die. They sacrificed their right to live when they murdered someone, maybe your mother. It’s about time we stopped making it easy for criminals to kill people and get away with it.”

— *Cascade News*

- ▲ 17. Letter to the editor: “In regard to your editorial, ‘Crime bill wastes billions,’ let me set you straight. Your paper opposes mandatory life sentences for criminals convicted of three violent crimes, and you whine about how criminals’ rights might be violated. Yet you also want to infringe on a citizen’s right to keep and bear arms. You say you oppose life sentences for three-time losers because judges couldn’t show any leniency toward the criminals no matter how trivial the crime. What is your definition of trivial, busting an innocent child’s skull with a hammer?”
- North State Record
- ▲ 18. Freedom means choice. This is a truth antiporn activists always forget when they argue for censorship. In their fervor to impose their morality, groups like Enough Is Enough cite extreme examples of pornography, such as child porn, suggesting that they are easily available in video stores.
- This is not the way it is. Most of this material portrays not actions such as this but consensual sex between adults.
- The logic used by Enough Is Enough is that, if something can somehow hurt someone, it must be banned. They don’t apply this logic to more harmful substances, such as alcohol or tobacco. Women and children are more adversely affected by drunken driving and secondhand smoke than by pornography. Few Americans would want to ban alcohol or tobacco, even though these substances kill hundreds of thousands of people each year.

Writing Exercises

1. Write a one-page essay in which you determine whether and why it is better (you get to define “better”) to look younger than your age, older than your age, or just your age. Then number the premises and conclusions in your essay and diagram it.
2. Should there be a death penalty for first-degree murder? On the top half of a sheet of paper, list considerations supporting the death penalty, and on the bottom half, list considerations opposing it. Take about ten minutes to compile your two lists.

After everyone is finished, your instructor will call on people to read their lists. He or she will then give everyone about twenty minutes to write a draft of an essay that addresses the issue “Should there be a death penalty for first-degree murder?” Put your name on the back of your paper. After everyone is finished, your instructor will collect the papers and redistribute them to the class. In groups of four or five, read the papers that have been given to your group. Do not look at the names of the authors. Select the best essay in each group. Your instructor will ask each group to read the essay it has selected as best.

As an alternative, your instructor may have each group rank-order the papers. He or she will have neighboring groups decide which of their top-ranked papers is the best. The instructor will read the papers that have been top-ranked by two (or more) groups, for discussion.

3. Follow the instructions for Exercise 2, but this time address the question “Are free-needle programs a good idea?” (Selections 15A and 15B in Appendix 1 may give you some ideas. Your instructor may provide extra time for you to read those selections.)
4. If you have not done so already, turn to Selection 8, 11, or 18 in Appendix 1 and follow the first set of instructions.
5. Turn to Selection 9 or 13 in Appendix 1 and follow the instructions.
6. Turn to Selections 11A,B; 15A,B; 16A,B; 17A,B; or 19A,B in Appendix 1 and discuss which side has the stronger argument and why.