▲ 8. 1. ~Q & (~S & ~T)
2. P → (Q ∨ S) / ∴ ~P

9. 1. P ∨ (S & R)
2. T → (~P & ~R) / ∴ ~T

10. 1. (S & P) → R
2. S /P → R

Exercise 9-13 Derive the indicated conclusions from the premises supplied.

▲ 1. 1. P → R
2. R → Q / ∴ ~P ∨ Q

2. 1. ~P ∨ S
2. ~T → ~S / ∴ P → T

3. 1. F → R
2. L → S
3. ~C
4. (R & S) → C / ∴ ~F ∨ ~L

▲ 4. 1. P ∨ (Q & R)
2. (P ∨ Q) → S / ∴ S

5. 1. (S & R) → P
2. (R → P) → W
3. S / ∴ W

6. 1. ~L → (~P → M)
2. ~(P ∨ L) / ∴ M

▲ 7. 1. (M ∨ R) & P
2. ~S → ~P
3. S → ~M / ∴ R

8. 1. Q → L
2. P → M
3. R ∨ P
4. R → (Q & S) / ∴ ~M → L

9. 1. Q → S
2. P → (S & L)
3. ~P → Q
4. S ∨ R / ∴ R & S

▲ 10. 1. P ∨ (R & Q)
2. R → ~P
3. Q → T / ∴ R → T

Conditional Proof

Conditional proof (CP) is both a rule and a strategy for constructing a deduction. It is based on the following idea: Let's say we want to produce a deduction for a conditional claim, P → Q. If we produce such a deduction, what have we proved? We've proved the equivalent of "If P were true, then Q would be true." One way to do this is simply to *assume* that P is true (that is, to add it as an additional premise) and then to prove that, on that assumption, Q has to be true. If we can do that—prove Q after assuming P—then we'll have proved that, if P then Q, or P → Q. Let's look at an example of how to do this; then we'll explain it again.

Here is the way we'll use CP as a new rule: Simply write down the antecedent of whatever conditional we want to prove, drawing a circle around the number of that step in the deduction; in the annotation, write "CP Premise" for that step. Here's what it looks like:

1.	P ∨ (Q → R)	Premise
2.	Q	Premise / ∴ ~P → R
(3.)	~P	CP Premise

Then, after we've proved what we want—the consequent of the conditional—in the next step, we write the full conditional down. Then we draw a line in the margin to the left of the deduction from the premise with the circled number to the number of the line we deduced from it. (See below for an example.) In the annotation for the last line in the process, list *all the steps from the circled number to the one with the conditional's consequent,* and give CP as the rule. Drawing the line that connects our earlier CP premise with the step we derived from it indicates we've stopped making the assumption that the premise, which is now the antecedent of our conditional in our last step, is true. This is known as *discharging the premise.* Here's how the whole thing looks:

1.	P ∨ (Q → R)	Premise
2.	Q	Premise / ∴ ~P → R
┌(3.)	~P	CP Premise
│4.	Q → R	1, 3, DA
└5.	R	2, 4, MP
6.	~P → R	3–5, CP

Here's the promised second explanation. Look at the example. Think of the conclusion as saying that, given the two original premises, *if* we had ~P, we could get R. One way to find out if this is so is to *give ourselves* ~P and then see if we can get R. In step 3, we do exactly that: We give ourselves ~P. Now, by circling the number, we indicate that *this is a premise we've given ourselves* (our "CP premise") and therefore that it's one we'll have to get rid of before we're done. (We can't be allowed to invent, use, and keep just any old premises we like—we could prove *anything* if we could do that.) But once we've given ourselves ~P, getting R turns out to be easy! Steps 4 and 5 are pretty obvious, aren't they? (If not, you need more practice with the other rules.) In steps 3 through 5, what we've actually proved is that *if* we had ~P, then we could get R. So we're justified in writing down step 6 because that's exactly what step 6 says: If ~P, then R.

Once we've got our conditional, ~P → R, we're no longer dependent on the CP premise, so we draw our line in the left margin from the last step that depended on the CP premise back to the premise itself. We *discharge* the premise.

Here are some very important restrictions on the CP rule:

1. CP can be used only to produce a conditional claim: After we discharge a CP premise, the very next step must be a conditional with the preceding step as consequent and the CP premise as antecedent. [Remember that lots of claims are equivalent to conditional claims. For example, to get (~P ∨ Q), just prove (P → Q), and then use IMPL.]

2. If more than one use is made of CP at a time—that is, if more than one CP premise is brought in—they must be discharged in exactly the reverse order from that in which they were assumed. This means that the lines that run from different CP premises must not cross each other. See examples below.

3. Once a CP premise has been discharged, no steps derived from it—those steps encompassed by the line drawn in the left margin—may be used in the deduction. (They depend on the CP premise, you see, and it's been discharged.)

4. All CP premises must be discharged.

This sounds a lot more complicated than it actually is. Refer back to these restrictions on CP as you go through the examples, and they will make a good deal more sense.

Here's an example of CP in which two additional premises are assumed and discharged in reverse order.

1. P → [Q ∨ (R & S)]	Premise	
2. (~Q → S) → T	Premise	/ ∴ P → T
(3.) P	CP Premise	
4. Q ∨ (R & S)	1, 3, MP	
(5.) ~Q	CP Premise	
6. R & S	4, 5, DA	
7. S	6, SIM	
8. ~Q → S	5–7, CP	
9. T	2, 8, MP	
10. P → T	3–9, CP	

Notice that the additional premise added at step 5 is discharged when step 8 is completed, and the premise at step 3 is discharged when step 10 is completed. Once again: Whenever you discharge a premise, you must make that premise the antecedent of the next step in your deduction. (You might try the preceding deduction without using CP; doing so will help you appreciate having the rule, however hard to learn it may seem at the moment. Using CP makes many deductions shorter, easier, or both.)

Here are three more examples of the correct use of CP:

1. (R → ~P) → S	Premise	
2. S → (T ∨ Q)	Premise	/ ∴ ~(R & P) → (T → Q)
(3.) ~(R & P)	CP Premise	
4. ~R ∨ ~P	3, DEM	
5. R → ~P	4, IMPL	
6. S	1, 5, MP	
7. (T ∨ Q)	2, 6, MP	
8. ~(R & P) → (T ∨ Q)	3–7, CP	

In this case, one use of CP follows another:

1. (P ∨ Q) → R	Premise	
2. (S ∨ T) → U	Premise	(∴/~R → ~P) & (~U → ~T)
(3.) ~R	CP Premise	
4. ~(P ∨ Q)	1, 3, MT	
5. ~P & ~Q	4, DEM	
6. ~P	5, SIM	
7. ~R → ~P	3–6, CP	
(8.) ~U	CP Premise	
9. ~(S ∨ T)	2, 8, MT	
10. ~S & ~T	9, DEM	
11. ~T	10, SIM	
12. ~U → ~T	8–11, CP	
13. (~R → ~P) & (~U → ~T)	7, 12, CONJ	

In this case, one use of CP occurs "inside" another:

1. R → (S & Q)	Premise	
2. P → M	Premise	
3. S → (Q → ~M)	Premise	
4. (J ∨ T) → B	Premise	/ ∴ R → (J → (B & ~P))
(5.) R	CP Premise	
(6.) J	CP Premise	
7. J ∨ T	6, ADD	
8. B	4, 7, MP	
9. (S & Q)	1, 5, MP	
10. (S & Q) → ~M	3, EXP	
11. ~M	9, 10, MP	
12. ~P	2, 11, MT	
13. B & ~P	8, 12, CONJ	
14. J → (B & ~P)	6–13, CP	
15. R → (J → (B & ~P))	5–14, CP	

Before ending this section on deductions, we should point out that our system of truth-functional logic has a couple of properties that are of great theoretical interest: It is both sound and complete. To say that a logic system is sound (in the sense most important to us here) is to say that *every deduction that can be constructed using the rules of the system constitutes a valid argument.* Another way to say this is that no deduction or string of deductions allows us to begin with true sentences and wind up with false ones.

To say that our system is complete is to say that *for every truth-functionally valid argument that there is (or even could be), there is a deduction in our system of rules that allows us to deduce the conclusion of that argument from its premises.* That is, if conclusion C really does follow validly from premises P and Q, then we know for certain that it is possible to construct a deduction beginning with just P and Q and ending with C.

We could have produced a system that is both sound and complete and that had many fewer rules than our system has. However, in such systems, deductions tend to be very difficult to construct. Although our system is burdened with a fairly large number of rules, once you learn them, producing proofs is not too difficult. So, in a way, every system of logic is a trade-off of a sort. You can make the system small and elegant but difficult to use, or you can make it larger and less elegant but more efficient in actual use. (The smaller systems are more efficient for some purposes, but those purposes are quite different from ours in this book.)

Recap

The following topics were covered in Chapter 9:

- Truth-functional symbols, their truth tables, and their English counterparts: negation, conjunction, disjunction, conditional (see Figure 1, page 300, for a summary).
- Symbolizations of truth functions can represent electrical circuits because "true" and "false" for sentences can be made to correspond to "on" and "off" for circuits.
- Sentences in normal English can be symbolized by claim letters and our four truth-functional symbols; care is required to make sure the result is equivalent.
- Many truth-functional arguments can be evaluated using just a few common argument forms.
- The truth-table method and the short truth-table method both allow us to determine whether an argument is truth-functionally valid.
- Certain elementary valid argument forms and equivalences are helpful in determining the validity of arguments (see Figure 2, page 333, for a summary).
- Deductions can be used to prove the validity of truth-functional arguments; they make use of the rules on the Figure 2, page 333, and the rule of conditional proof, page 337.

Additional Exercises

Exercise 9-14

Display the truth-functional structure of the following claims by symbolizing them. Use the letters indicated.

D = We do something to reduce the deficit.
B = The balance of payments gets worse.
C = There is (or will be) a financial crisis.

▲ 1. The balance of payments will not get worse if we do something to reduce the deficit.
2. There will be no financial crisis unless the balance of payments gets worse.
3. Either the balance of payments will get worse, or, if no action is taken on the deficit, there will be a financial crisis.
▲ 4. The balance of payments will get worse only if we don't do something to reduce the deficit.
5. Action cannot be taken on the deficit if there's a financial crisis.
6. I can tell you about whether we'll do something to reduce the deficit and whether our balance of payments will get worse: Neither one will happen.
▲ 7. In order for there to be a financial crisis, the balance of payments will have to get worse and there will have to be no action taken to reduce the deficit.
8. We can avoid a financial crisis only by taking action on the deficit and keeping the balance of payments from getting worse.
9. The *only* thing that can prevent a financial crisis is our doing something to reduce the deficit.

Exercise 9-15

For each of the numbered claims below, there is exactly one lettered claim that is equivalent. Identify the equivalent claim for each item. (Some lettered claims are equivalent to more than one numbered claim, so it will be necessary to use some letters more than once.)

▲ 1. Oil prices will drop if the OPEC countries increase their production.
2. Oil prices will drop only if the OPEC countries increase their production.
3. Neither will oil prices drop, nor will the OPEC countries increase their production.
▲ 4. Oil prices cannot drop unless the OPEC countries increase their production.
5. The only thing that can prevent oil prices dropping is the OPEC countries' increasing their production.
6. A drop in oil prices is necessary for the OPEC countries to increase their production.

7. All it takes for the OPEC countries to increase their production is a drop in oil prices.
8. The OPEC countries will not increase their production while oil prices drop; each possibility excludes the other.
   a. It's not the case that oil prices will drop, and it's not the case that the OPEC countries will increase their production.
   b. If OPEC countries increase their production, then oil prices will drop.
   c. Only if OPEC countries increase their production will oil prices drop.
   d. Either the OPEC countries will not increase their production, or oil prices will not drop.
   e. If the OPEC countries do not increase production, then oil prices will drop.

Exercise 9-16

Construct deductions for each of the following. (Try these first without using conditional proof.)

1. 1. P
   2. Q & R
   3. (Q & P) → S   / ∴ S
2. 1. (P ∨ Q) & R
   2. (R & P) → S
   3. (Q & R) → S   / ∴ S
3. 1. P → (Q → ~R)
   2. (~R → S) ∨ T
   3. ~T & P   / ∴ Q → S
4. 1. P ∨ Q
   2. (Q ∨ U) → (P → T)
   3. ~P
   4. (~P ∨ R) → (Q → S)   / ∴ T ∨ S
5. 1. (P → Q) & R
   2. ~S
   3. S ∨ (Q → S)   / ∴ P → T
6. 1. P → (Q & R)
   2. R → (Q → S)   / ∴ P → S
7. 1. P → Q   / ∴ P → (Q ∨ R)
8. 1. ~P ∨ ~Q
   2. (Q → S) → R   / ∴ P → R
9. 1. S
   2. P → (Q & R)
   3. Q → ~S   / ∴ ~P

10. 1. (S → Q) → ~R
    2. (P → Q) → R   / ∴ ~Q

Exercise 9-17

Use the rule of conditional proof to construct deductions for each of the following.

1. 1. P → Q
   2. P → R   / ∴ P → (Q & R)
2. 1. P → Q
   2. R → Q   / ∴ (P ∨ R) → Q
3. 1. P → (Q → R)   / ∴ (P → Q) → (P → R)
4. 1. P → (Q ∨ R)
   2. T → (S & ~R)   / ∴ (P & T) → Q
5. 1. ~P → (~Q → ~R)
   2. ~(R & ~P) → ~S   / ∴ S → Q
6. 1. P → (Q → R)
   2. (T → S) & (R → T)   / ∴ P → (Q → S)
7. 1. P ∨ (Q & R)
   2. T → ~(P ∨ U)
   3. S → (Q → ~R)   / ∴ ~S ∨ ~T
8. 1. (P ∨ Q) → R
   2. (P → S) → T   / ∴ R ∨ T
9. 1. P → ~Q
   2. ~R → (S & Q)   / ∴ P → R
10. 1. (P & Q) ∨ R
    2. ~R ∨ Q   / ∴ P → Q

Exercise 9-18

Display the truth-functional form of the following arguments by symbolizing them; then use the truth-table method, the short truth-table method, or the method of deduction to prove them valid or invalid. Use the letters provided. (We've used underscores in the example and in the first two problems to help you connect the letters with the proper claims.)

Example

If Maria does not go to the movies, then she will help Bob with his logic homework. Bob will fail the course unless Maria helps him with his logic homework. Therefore, if Maria goes to the movies, Bob will fail the course. (M, H, F)

Symbolization

1. $\sim M \rightarrow H$ (Premise)
2. $\sim H \rightarrow F$ (Premise) $/ \therefore M \rightarrow F$

Truth Table

M	H	F	~M	~H	~M → H	~H → F	M → F
T	T	T	F	F	T	T	T
T	T	F	F	F	T	T	F

We need to go only as far as the second row of the table, since both premises come out true and the conclusion comes out false in that row.

▲ 1. If it's cold, Dale's motorcycle won't start. If Dale is not late for work, then his motorcycle must have started. Therefore, if it's cold, Dale is late for work. (C, S, L)

2. If profits depend on unsound environmental practices, then either the quality of the environment will deteriorate, or profits will drop. Jobs will be plentiful only if profits do not drop. So, either jobs will not be plentiful, or the quality of the environment will deteriorate. (U, Q, D, J)

3. The new road will not be built unless the planning commission approves the funds. But the planning commission's approval of the funds will come only if the environmental impact report is positive, and it can't be positive if the road will ruin Mill Creek. So, unless they find a way for the road not to ruin Mill Creek, it won't be built. (R, A, E, M)

▲ 4. The message will not be understood unless the code is broken. The killer will not be caught if the message is not understood. Either the code will be broken, or Holmes's plan will fail. But Holmes's plan will not fail if he is given enough time. Therefore, if Holmes is given enough time, the killer will be caught. (M, C, K, H, T)

5. If the senator votes against this bill, then he is opposed to penalties against tax evaders. Also, if the senator is a tax evader himself, then he is opposed to penalties against tax evaders. Therefore, if the senator votes against this bill, he is a tax evader himself. (V, O, T)

6. If you had gone to class, taken good notes, and studied the text, you'd have done well on the exam. And if you'd done well on the exam, you'd have passed the course. Since you did not pass the course and you did go to class, you must not have taken good notes and not studied the text.

▲ 7. Either John will go to class, or he'll miss the review session. If John misses the review session, he'll foul up the exam. If he goes to class, however, he'll miss his ride home for the weekend. So John's either going to miss his ride home or foul up the exam.

8. If the government's position on fighting crime is correct, then if more people are locked up, then the crime rate should drop. But the crime rate has not dropped, despite the fact that we've been locking up record numbers of people. It follows that the government's position on fighting crime is not correct.

9. The creation story in the book of Genesis is compatible with the theory of evolution but only if the creation story is not taken literally. If, as most scientists think, there is plenty of evidence for the theory of evolution, the Genesis story cannot be true if it is not compatible with evolution theory. Therefore, if the Genesis story is taken literally, it cannot be true.

▲ 10. The creation story in the book of Genesis is compatible with the theory of evolution but only if the creation story is not taken literally. If there is plenty of evidence for the theory of evolution, which there is, the Genesis story cannot be true if it is not compatible with evolution theory. Therefore, if the Genesis story is taken literally, it cannot be true.

11. If there was no murder committed, then the victim must have been killed by the horse. But the victim could have been killed by the horse only if he, the victim, was trying to injure the horse before the race; and, in that case, there certainly was a crime committed. So, if there was no murder, there was still a crime committed.

12. Holmes cannot catch the train unless he gets to Charing Cross Station by noon; and if he misses the train, Watson will be in danger. Because Moriarty has thugs watching the station, Holmes can get there by noon only if he goes in disguise. So, unless Holmes goes in disguise, Watson will be in danger.

▲ 13. It's not fair to smoke around nonsmokers if secondhand cigarette smoke really is harmful. If secondhand smoke were not harmful, the American Lung Association would not be telling us that it is. But they are telling us that it's harmful. That's enough to conclude that it's not fair to smoke around nonsmokers.

14. If Jane does any of the following, she's got an eating disorder: if she goes on eating binges for no apparent reason, if she looks forward to times when she can eat alone, or if she eats sensibly in front of others and makes up for it when she's alone. Jane does in fact go on eating binges for no apparent reason. So it's clear that she has an eating disorder.

15. The number of business majors increased markedly during the past decade; and if you see that happening, you know that younger people have developed a greater interest in money. Such an interest, unfortunately, means that greed has become a significant motivating force in our society; and if greed has become such a force, charity will have become insignificant. We can predict that charity will not be seen as a significant feature of this past decade.

Exercise 9-19

Determine which of these contain valid arguments. The section titled "Truth-Functional Argument Patterns" (page 311) is sufficient to answer these. Otherwise, either truth-tables or deductions may be used.

1. If Bobo is smart, then he can do tricks. However, Bobo is not smart. So he cannot do tricks.

2. If God is always on America's side, then America wouldn't have lost any wars. America has lost wars. Therefore, God is not always on America's side.
3. If your theory is correct, then light passing Jupiter will be bent. Light passing Jupiter is bent. Therefore, your theory is correct.
4. Moore eats carrots and broccoli for lunch, and if he does that, he probably is very hungry by dinnertime. Conclusion: Moore is very hungry by dinnertime.
5. If you value your feet, you won't mow the lawn in your bare feet. Therefore, since you do mow the lawn in your bare feet, we can conclude that you don't value your feet.
6. If Bobo is smart, then he can do tricks; and he can do tricks. Therefore, he is smart.
7. If Charles had walked through the rose garden, then he would have mud on his shoes. We can deduce, therefore, that he did walk through the rose garden, because he has mud on his shoes.
8. If it rained earlier, then the sidewalks will still be wet. We can deduce, therefore, that it did rain earlier, because the sidewalks are still wet.
9. If you are pregnant, then you are a woman. We can deduce, therefore, that you are pregnant, because you are a woman.
10. If this stuff is on the final, I will get an A in the class because I really understand it! Further, the teacher told me that this stuff will be on the final, so I know it will be there. Therefore, I know I will get an A in the class.
11. If side A has an even number, then side B has an odd number, but side A does not have an even number. Therefore, side B does not have an odd number.
12. If side A has an even number, then side B has an odd number, and side B does have an odd number. Therefore, side A has an even number.
13. If the theory is correct, then we will have observed squigglyitis in the specimen. However, we know the theory is not correct. Therefore, we did not observe squigglyitis in the specimen.
14. If the theory is correct, then we will have observed dilation in the specimen. Therefore, since we did not observe dilation in the specimen, we know the theory is not correct.
15. If we observe dilation in the specimen, then we know the theory is correct. We observed dilation—so the theory is correct.
16. If the comet approached within 1 billion miles of the earth, there would have been numerous sightings of it. There weren't numerous sightings. So it did not approach within 1 billion miles.
17. If Baffin Island is larger than Sumatra, then two of the five largest islands in the world are in the Arctic Ocean. And Baffin Island, as it turns out, is about 2 percent larger than Sumatra. Therefore, the Arctic Ocean contains two of the world's largest islands.
18. If the danger of range fires is greater this year than last, then state and federal officials will hire a greater number of firefighters to cope with the danger. Since more firefighters are already being hired this year than were hired all last year, we can be sure that the danger of fires has increased this year.

19. If Jack Davis robbed the Central Pacific Express in 1870, then the authorities imprisoned the right person. But the authorities did not imprison the right person. Therefore, it must have not been Jack Davis who robbed the Central Pacific Express in 1870.
20. If the recent tax cuts had been self-financing, then there would have been no substantial increase in the federal deficit. But they turned out not to be self-financing. Therefore, there will be a substantial increase in the federal deficit.
21. The public did not react favorably to the majority of policies recommended by President Ronald Reagan during his second term. But if his electoral landslide in 1984 had been a mandate for more conservative policies, the public would have reacted favorably to most of those he recommended after the election. Therefore, the 1984 vote was not considered a mandate for more conservative policies.
22. Alexander will finish his book by tomorrow afternoon only if he is an accomplished speed reader. Fortunately for him, he is quite accomplished at speed reading. Therefore, he will get his book finished by tomorrow afternoon.
23. If higher education were living up to its responsibilities, the five best-selling magazines on American campuses would not be *Cosmopolitan, People, Playboy, Glamour,* and *Vogue.* But those are exactly the magazines that sell best in the nation's college bookstores. Higher education, we can conclude, is failing in at least some of its responsibilities.
24. Broc Glover was considered sure to win if he had no bad luck in the early part of the race. But we've learned that he has had the bad luck to be involved in a crash right after the start, so we're expecting another driver to be the winner.
25. If Boris is really a spy for the KGB, then he has been lying through his teeth about his business in this country. But we can expose his true occupation if he's been lying like that. So, I'm confident that if we can expose his true occupation, we can show that he's really a KGB spy.
26. The alternator is not working properly if the ammeter shows a negative reading. The current reading of the ammeter is negative. So, the alternator is not working properly.
27. Fewer than 2 percent of the employees of New York City's Transit Authority are accountable to management. If such a small number of employees are accountable to the management of the organization, no improvement in the system's efficiency can be expected in the near future. So, we cannot expect any such improvements any time soon.
28. If Charles did not pay his taxes, then he did not receive a refund. Thus, he did not pay his taxes, since he did not receive a refund.
29. If they wanted to go to the party, then they would have called by now. But they haven't, so they didn't.
30. "You'll get an A in the class," she predicted.
"What makes you say that?" he asked.
"Because," she said, "if you get an A, then you're smart, and you *are* smart."

31. If Florin arrived home by eight, she received the call from her attorney. But she did not get home by eight, so she must have missed her attorney's call.
32. The off-shore drilling problem will be solved, but only if the administration stops talking and starts acting. So far, however, all we've had from the president is words. Words are cheap. Action is what counts. The problem will not be remedied, at least not while this administration is in office.

Exercise 9-20

Using the method described in Chapter 2, diagram five of the items in the previous exercise.

Writing Exercises

1. a. In a one-page essay evaluate the soundness of the argument in the box on page 320. Write your name on the back of your paper.
   b. When 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 and select the best one. The instructor will select one group's top-rated paper to read to the class for discussion.
2. Take about fifteen minutes to write an essay responding to the paper the instructor has read to the class in Writing Exercise 1. When everyone is finished, the members of each group will read each other's responses and select the best one to share with the class.

10 Thinking Critically About Inductive Reasoning

In this chapter we explain how to think critically about inductive reasoning. You may recall from Chapter 2 that inductive reasoning is used to support rather than to demonstrate a conclusion, and that we evaluate an inductive argument as relatively strong or weak depending on how much its premise increases the probability of the conclusion. As we use these terms, "strong" and "weak" are not absolutes. One argument for a conclusion is stronger than another argument for that conclusion if its premise increases the probability of the conclusion by a greater amount.

Now, the key to understanding inductive reasoning—and the material in this chapter—is to keep in mind always that we are concerned with the strength of arguments, not with the probability of claims in and of themselves. Here comes an acquaintance, Mr. York. Is York a Democrat? Estimating the probability that he is a Democrat is one thing; gauging the strength of this or that argument that he is a Democrat is another thing. Accurately gauging the probability that Mr. York is a Democrat requires employing what logicians refer to as the **Principle of Total Evidence**, which means simply that you must take into account all the information you have. But gauging the strength of this or that argument that Mr. York is a Democrat is a separate order of business and does not require us to employ the Principle of Total Evidence.

Students will learn to . . .

1. Identify and differentiate statistical syllogisms, inductive generalizations from samples, and inductive arguments from analogy
2. Explain the Principle of Total Evidence in inductive reasoning
3. Define and explain the key terms related to samples and sampling
4. Differentiate between scientific generalizing from samples and everyday generalizing from samples
5. Apply the two principles of evaluating everyday generalizations from samples
6. Analyze analogies and analogues
7. Identify informal indicators of confidence levels and error margins
8. Understand and identify various fallacies related to induction