

Using Logic and Reasoning

Materials

Using Logic to Solve Problem handout (1 copied for each 2 participants)

Description

This engaging group activity helps develop logic, reasoning, and problem solving skills.

Step-by-Step

1. Select three people to read the inductive reasoning script or you and your co presenter and one participant may read the parts.
2. You may need to discuss deductive and inductive reasoning. (If you start with the pieces and move to the whole, you are using inductive reasoning. If you start with the whole to pieces, you are using deductive reasoning.)

Some notes that might help:

Inductive Reasoning

- Focusing on specific information or observations
- Searching for patterns or connections in it
- Constructing a general statement that explains what you've observed
- Making further observations to see if your general statement applies; if it doesn't adjust it accordingly

Example: Every mammal that has ever been examined has hair. Therefore, all mammals have hair.

Deductive Reasoning

- Identifying the specific situation
- Identifying the generalizations or principles that apply to it
- Determining if the specific situation meets the conditions necessary for those generalizations or principles to apply
- If they do apply, identifying any conclusions that can be drawn or predictions that can be made.

Example: All men are mortal; Socrates is a man; therefore, Socrates is mortal. Sherlock Homes uses this kind of reasoning.

3. Let participants work with a partner to solve the mind benders using deductive reasoning.



Use logic to solve the problems.

You've Got Character!

Four students wrote book reports on the same book. Each student described the main character in his or her report. But their teacher could tell that these students didn't read very carefully, because each one described the main character differently.

- Annie wrote that his name is Heathcliff, he is short, he has long hair, and that he wears an earring.
- Bernard wrote that his name is Sherlock and that he is tall, has long hair, and wears an earring.
- Carolyn wrote that his name is Romeo and that he is medium height, has short hair, and wears an earring.
- Daniel wrote that his name is Harry and that he is short, has long hair, and never wears an earring.

Each student got only one detail of four correct. What is the correct description of the main character of the book?

Suggestion: Begin by making a chart like the following:

Student	character	height	hair length	earring?



Three Little Pigs

The three little pigs, as you know, built houses—one of straw, one of sticks, and one of bricks. By reading the six cues, figure out which pig built each house, the size of each house, and the town in which each house was located. Use a chart to keep track of your information and your logic.

	Town	Size	Material
Patricia Pig			
Penny Pig			
Peter Pig			

1. Penny Pig did not build a brick house.
2. The straw house was not medium sized.
3. Peter’s house was made of sticks, and it was neither medium nor small.
4. Patricia Pig built her house in Pleasantville.
5. The house in Hillsdale was large.
6. One house was in a town called Riverview.

Source: Barnes and Noble, *100 Games of Logic* by Pierre Berloquin.



Who's the Guilty Man?

On a distant island live three types of humans - Knights, Knaves and Normals. The Knights always tell the truth, the Knaves always lie, and the Normals sometimes lie and sometimes tell the truth.

Detectives questioned three inhabitants of the island - Al, Bob, and Clark - as part of the investigation of a terrible crime. The investigators knew that one of the three committed the crime, but did not at first know which one. They also knew that the criminal was a Knight, and that the other two were not. How they knew these things is not important for the solution.

Additionally, the investigators made a transcript of the statements made by each of the three men. What follows is that transcript:

Al: I am innocent.

Bob: That is true.

Clark: Bob is not a Normal.

After carefully and logically analyzing their information, the investigators positively identified the guilty man. Was it Al, Bob or Clark?

Source: <http://www.classroomtools.com/logic.htm>

Use logic to solve the problems. **KEY**

You've Got Character!

Four students wrote book reports on the same book. Each student described the main character in his or her report. But their teacher could tell that these students didn't read very carefully, because each one described the main character differently.

- Annie wrote that his name is Heathcliff, he is short, he has long hair, and that he wears an earring.
- Bernard wrote that his name is Sherlock and that he is tall, has long hair, and wears an earring.
- Carolyn wrote that his name is Romeo and that he is medium height, has short hair, and wears an earring.
- Daniel wrote that his name is Harry and that he is short, has long hair, and never wears an earring.

Each student got only one detail of four correct. What is the correct description of the main character of the book?

Suggestion: Begin by making a chart like the following:

Student	character	Height	hair length	Earring?
Annie	Heathcliff	Short	Long	Yes
Bernard	Sherlock	Tall	Long	Yes
Carolyn	Romeo	Medium	Short	Yes
Daniel	Harry	Short	Long	Yes

- Since only one detail in each column can be correct, we know the character doesn't wear an earring, so cross out each "yes" in the earring column. Daniel was right about the earring.
- Since Daniel can be right about only one thing, cross out "Harry," "short," and "long" in Daniel's row.
- Since only one detail in each column can be correct, you can cross out "long" the two times it still appears in the hair-length. Carolyn was right about the hair.
- Since Carolyn can be right about only one thing, cross out "Romeo" and "medium" in Carolyn's column.

- We already crossed out “short” in Daniel’s row, so cross it out in Annie’s row, as well.
- Since Annie has to be right about one detail, it must be Heathcliff—the main character’s name.
- That means that Bernard has to be right about one thing, we know the character is tall.
- Since Bernard has to be right about one thing, we know the character is tall.

Heathcliff, the main character of the book, is tall, has short hair, and never wears an earring.

Three Little Pigs

The three little pigs, as you know, built houses—one of straw, one of sticks, and one of bricks. By reading the six cues, figure out which pig built each house, the size of each house, and the town in which each house was located. Use a chart to keep track of your information and your logic.

	Town	Size	Material
Patricia Pig	Pleasantville	Medium	Brick
Penny Pig	Riverview	Small	Straw
Peter Pig	Hillsdale	Large	Sticks

7. Penny Pig did not build a brick house.
8. The straw house was not medium sized.
9. Peter’s house was made of sticks, and it was neither medium nor small.
10. Patricia Pig built her house in Pleasantville.
11. The house in Hillsdale was large.
12. One house was in a town called Riverview.

Who’s the Guilty Man?

On a distant island live three types of humans - Knights, Knaves and Normals. The Knights always tell the truth, the Knaves always lie, and the Normals sometimes lie and sometimes tell the truth.

Detectives questioned three inhabitants of the island - Al, Bob, and Clark - as part of the investigation of a terrible crime. The investigators knew that one of the three committed the crime, but did not at first know which one. They also knew that the criminal was a

Knight, and that the other two were not. How they knew these things is not important for the solution.

Additionally, the investigators made a transcript of the statements made by each of the three men. What follows is that transcript:

Al: I am innocent.

Bob: That is true.

Clark: Bob is not a Normal.

After carefully and logically analyzing their information, the investigators positively identified the guilty man. Was it Al, Bob or Clark?

Bob is the guilty Knight