

## Questions

Is there a disadvantage to working alone? Is there an advantage to working in groups?

## Materials Needed

For this activity, you will need the following materials:

- a pencil (do not use ink)
- the ability to read and follow directions

## Points To Remember

Unless otherwise explicitly instructed, your responses must not contain personal opinions. All of your responses must be in the form of complete sentences; the fewer sentences the better. Spelling and grammar must be correct. Effective communication is essential for both learning and doing science.

Don't ask instructors for answers to questions posed in activities; you won't get them. You may ask questions regarding the clarity of the instructions or the soundness of your reasoning. If you encounter a word you are not familiar with, don't ask the instructor about it. Look it up first in your glossary and then a dictionary or some other source if necessary. Ensure that all definitions are unanimously agreed upon before proceeding. There are, of course, sound reasons for these policies. See the instructor if you have questions, but do not complain about these policies. They are not negotiable.

## 1 A Story of Dragons

### 1.1 Background Information

Dragons in the Kingdom of Lidd are of two types. Some have reasoned accurately that devouring farm animals and their owners has attracted the attention of knights and is, in the long run, not a healthy thing for dragons to do. They have since totally refrained from this practice. These dragons are known as **rationals**, and they are protected by law.

Some dragons, on the other hand, have not learned to fear humans and continue in their traditional ways. These dragons are known as *predators*, and they are not protected by law.

In addition to being rationals or predators, dragons in Lidd come in two different colors (gray and red), related to their veracity. Gray rationals always speak the truth. Red rationals always lie. Red predators always speak the truth. Gray predators always lie.

It is necessary for knights to know which dragons are rationals and which are predators. To tell if a dragon is protected, it would help to know its color. However, all humans in Lidd are born color-blind. To knights, all dragons look gray. Therefore,

it is important for knights to ask a dragon his type and color, and to attempt to determine whether the answers are truthful or false. Your challenge is to determine the color and type of each dragon in the following puzzle.

A knight approaches two dragons (**A** and **B**) and inquires as to the color and type of each. Remember that gray rationals and red predators always speak the truth. Red rationals and gray predators always lie. The dragons respond to the knight as follows:

- A.** I am gray. B is a predator.
- B.** A is a predator. I am a rational.

## 1.2 The Puzzle Worked Individually

From these responses, determine each dragon's color (r for red, g for gray) and type (R for rational P for predator) and fill in the table. Use the space provided to work or write out anything you think might help you.

	A	B
color		
type		

### 1.3 The Same Puzzle Worked Cooperatively

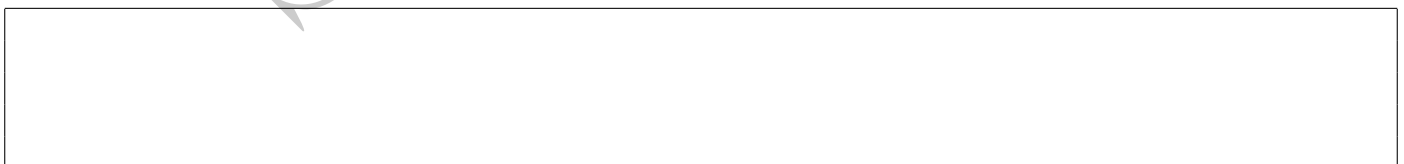
Team up with one, two, or three (your instructor will specify which) and work through this puzzle again as a group. Use the space provided to work or write out anything you think might help you.

	A	B
color		
type		



## 2 Inquiry

Did you find this puzzle easier when working individually or when working cooperatively? Defend your choice.



Would you trust an individual's answer more than you would trust a group's answer? Defend your choice.

Do you think scientists work better as individuals or in groups? Defend your response.

— CHECKPOINT —

What could be done to make this activity more interesting? Please be honest.