

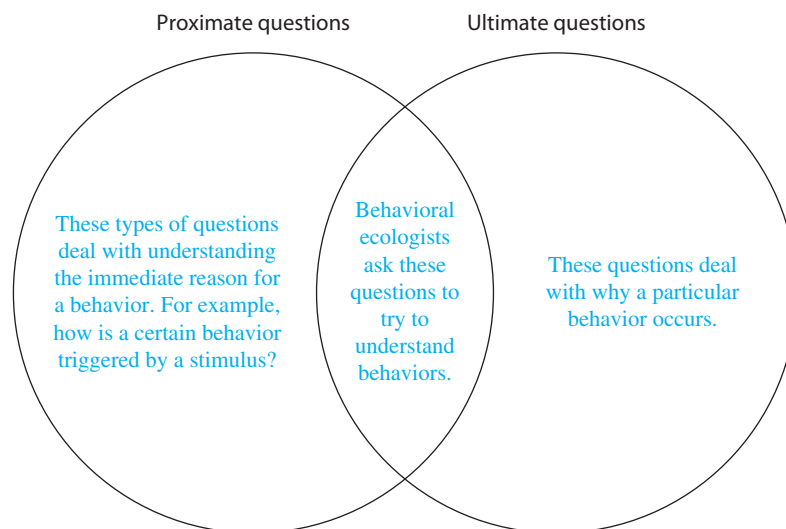
## Chapter 35: Behavioral Adaptations to the Environment

### Guided Reading Activities

#### Big idea: The scientific study of behavior

Answer the following questions as you read modules 35.1–35.3:

1. Which of the following is a behavior?
  - a. The release of insulin in response to eating a meal
  - b. Jerking your hand away after touching something hot
  - c. A peacock showing off his vibrant plumage
  - d. All of the above are behaviors
  
2. The study of behavior in the context of evolution is known as behavioral ecology.
  
3. Complete the Venn diagram that compares proximate questions with ultimate questions.



4. Is any FAP considered an innate behavioral response? Briefly explain your answer.  
Yes, a graylag goose retrieving an egg is triggered by the presence of an egg.
5. True or false: FAPs are always simple behaviors. If false, make it a correct statement.  
False, complex behaviors can result from several FAPs performed in sequence.
6. To answer this question, draw on your knowledge of the experiments of Lorenz and Tinbergen with the graylag geese. What would you expect a baby bird to do if you put a hand puppet on that looked like a bird and put it near the baby bird? What would be its proximate cause (FAP) and what would be the ultimate cause?  
You would expect the bird to respond with an FAP by opening its beak and chirping. The proximate cause is the appearance of the adult bird. The ultimate cause is that the baby bird gets fed and grows to an adult with a good chance of reproducing with success.
7. What was the takeaway message from the experiments on the *fru* gene and the Norway rats?  
The takeaway was that behavior is a product of both genetic and environmental components.

**Big idea: Learning**

Answer the following questions as you read modules 35.4–35.11:

1. The trip to your friend's house involves turning on a road that is immediately after a cemetery. After repeated trips to your friend's house, you have come to turn instinctively after the cemetery. Which type of learning have you exhibited?
  - a. Habituation
  - b. Spatial
  - c. Associative
  - d. Social
2. The changing of an organism's behavior as a result of one or more experiences is known as learning.
3. Imprinting is a type of learning that is limited to a specific time known as the sensitive period. This type of learning is generally not reversible.
4. In Konrad Lorenz's imprinting experiments with baby geese, identify the innate behavior and the learned behavior.  
The innate behavior was the ability of the baby geese to imprint. The learned behavior was the actual imprinting on Lorenz.



12. Briefly explain how social learning differs from associative learning. Provide an example of social learning and associative learning in a person's life that will help make your point.  
**Social learning differs from associative learning because social learning is based on observing the behaviors of others. An example of associative learning in a human is not touching a hot stove again after being burned by it. An example of social learning is acting like a role model.**
13. The overall process of storing and integrating data received from the senses is known as cognition.
14. A 10-year-old boy learns that he can reach the cookies on the top shelf of the pantry by using the bottom shelf of the pantry as a stepping stool. Which of the following types of learning is being exhibited?
  - a. Spatial learning
  - b. Habituation
  - c. Associative learning
  - d. **Problem solving**

**Big idea: Survival and reproductive success**

Answer the following questions as you read modules 35.12–35.16:

1. You know your brother is 6'2" tall and has a big, bushy beard. You are looking for him in a crowded airport. You are quickly looking for a tall guy with a bushy beard. What technique are you using? Briefly explain your answer.  
**You are using a search image because you are not looking intently at each face. Instead, you are scanning for a particular set of criteria.**
2. The idea that an animal tries to acquire maximum energy with minimal effort is known as the optimal foraging theory.
3. True or false: Many animals forage in groups in order to increase efficiency and decrease risk of predation. If false, make it a correct statement.  
**True**
4. Communication is a key interaction between animals that involves the sending or receiving of any stimuli known as a(n) signal.
5. List two ways in which a lemur displays aggression. What type of signals are they?  
**It waves its tail and emits an odor from a substance it rubs on its tail. These are visual- and scent-based signals.**

6. Identify the ultimate question and cause in sage grouse courtship and mating.  
An ultimate question may be: Why do the males strut about with erect tail feathers? The ultimate cause may be that this behavior wins them a mate, which allows them to pass on their genes.
7. Complete the following table, which compares different mating systems.

	Monogamous	Polygamous	Promiscuous
<b>Description</b>	Is a bond between one male and one female of a species	A mating system that is characterized by one male and multiple females (usually)	A mating system characterized by no lasting bond between partners
<b>Advantages/disadvantages</b>	An organism does not have to engage in costly courtship rituals over and over.	It may lead to increased reproductive success due to the increased number of partners.	It may lead to increased reproductive success because of the increased number of partners.

8. The effects of human-generated pollutants are far ranging. List three adverse effects of pollutants on animal behavior.
- (1) PCB exposure disrupts spatial learning in young monkeys.
  - (2) The nest-guarding behavior of male stickleback fish dropped after exposure to estrogen.
  - (3) Female mosquitofish were masculinized by endocrine disruptors from a paper mill's sewage discharge.

**Big idea: Social behavior and sociobiology**

Answer the following questions as you read modules 35.17–35.23:

1. True or false: Students gathered in a student lounge during lunch is an example of social behavior. If false, make it a correct statement.  
True
2. The area that an animal uses for breeding and foraging is known as its territory.
3. Briefly explain why ritualized combat is preferred over actual violent combat.  
Ritualized combat tends to keep both animals alive and able to stay reproductively fit.
4. Is the behavior of hens that are put together for the first time an example of an FAP? Briefly explain your answer. Your answer should include what the hens will likely do.  
Yes, it is an FAP because the hens automatically begin pecking each other to establish dominance. It is an innate behavior.

5. Match the following terms with their proper description: altruism, kin selection, and inclusive fitness.

**Behavior that benefits close relatives:** Kin selection

**Behavior that reduces an organism's fitness while increasing the fitness of another:** Altruism

**Producing your own offspring while helping close relatives:** Inclusive fitness

6. How did the results of the study done on Belding's ground squirrels provide support for kin selection?

*It showed that female squirrels were more likely to call out a warning to a predator if relatives were nearby.*

7. What key discovery did Jane Goodall make in her observations of chimpanzees?

*She discovered that chimpanzees used tools.*

8. True or false: Research in identical twins shows that many complex behavioral traits are almost exclusively the result of genes. If false, make it a correct statement.

*False, the research indicates that the environment is just as likely to affect complex behavioral traits as is DNA.*

9. Two identical twins are separated at birth and live in very different environments. A sociobiologist is studying a particular behavioral trait that she thinks is mostly genetic. What would she expect to see for this behavior between the two identical twins?

*If this were true, she would expect the trait to be the same in both twins.*

### CONNECTING THE BIG IDEAS

Use your knowledge of the information contained within this chapter's "Big Ideas" to answer this question.

Some people argue that there is no such thing as altruistic behavior. Specifically, there must be an advantage to an organism's supposed altruism. Do you agree? Briefly defend your answer either way.