

SCIENCE 703

THE BEHAVIOR OF LIVING THINGS

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INTELLIGENCE

God made man by His own hands. Only man has an eternal soul, because God breathed into him the breath of life. We are all special creatures created in God's own image and likeness. As a result we have special mental abilities that no other creatures have.

Man can think, reason, remember, speak, and learn from others' and his own experiences. Man has been able to greatly change his surroundings to make them more to his liking. Man has intelligence superior to any other creature. He can use this intelligence and knowledge for good or evil depending upon his relationship to the Creator. God created man capable of spiritual fellowship and He relates as a loving Father to those who willingly obey Him. But God has given man a free will to do as he desires. Freedom, however, is always coupled with responsibility. Man must live with the consequences of his choices. He is accountable to God to make decisions in harmony with God's purpose for him.

Joshua points out the choice in Joshua 24:15. He said, "And if it seem evil unto you to serve the LORD, choose you this day whom ye will serve; whether the gods which your fathers served that were on the other side of the flood, or the gods of the Amorites, in whose land ye dwell: but as for me and my house, we will serve the LORD." Joshua clearly points out that we have a choice—God and good or the world and evil. We choose where our eternal souls will live forever.

As God's special creation we have been given special responsibilities, such as dominion over all things, and also special favor and position with God. This relationship only exists between man and God; no other such relationships exist. What a comfort and responsibility this fact should give us.

Man's, God-given, superior intelligence has a great capacity for learning. It is doubtful that any human has ever learned all that his brain would be capable of learning.

The brain has two main ways of making learning possible—memory and association. Memory helps us to remember what we have already learned. Association helps us relate past experiences to present situations. We are going to examine three examples of learned responses which are possible because of memory and association.

Conditioned response. The first type of learned response is the conditioned response. This type of response is shown by your pet dog when you have trained him to speak in response to you saying, "Speak." Probably you trained him to bark by saying the word and when he did bark, you fed him a bite of food. After he learned the trick you could say "Speak," and he would automatically bark for you. The food became the stimulus which caused the dog to respond. Much of our training of animals and pets is really a conditioned-response learning.

As humans we also have conditioned responses. Frequently when one thing happens, we expect a particular thing to happen as a result. For example, if you have science class right before lunch each day, you may find yourself getting hungry during the period. If on one day, you have science an hour earlier because of a special assembly, you may find yourself getting hungry during science class even though it is far before lunchtime. The science class is the thing that happens (stimulus) and the hunger you feel is the result (response) of the first event.



Optional Experiment

These supplies are needed:

several goldfish in bowls
fish food



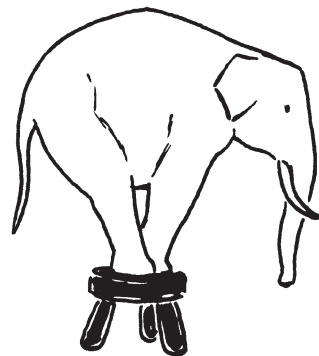
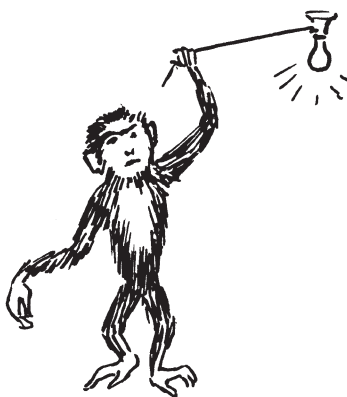
Follow these directions. Put a check mark in each box when the step is completed.

- ☐ 1. Feed a fish a little bit at a time and tap the side of the bowl at the same time.
- ☐ 2. Continue this procedure over about ten days.
- ☐ 3. At the end of ten to fourteen days, the tapping alone will cause the fish to rise to the top to feed. Try it by tapping with no food.

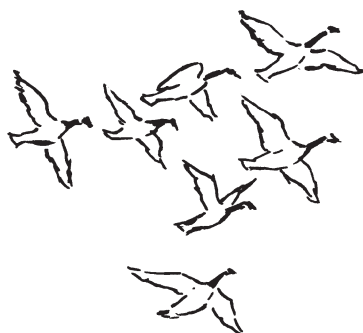


Answer this question.

1.36 What did you see when you tapped the bowl? _____



Conditioned Responses



Instinctive Behavior

Trial and error. A second type of learned response is trial-and-error learning. This learning takes place by trying many things one at a time until you find the right choice. The way a child works a jigsaw puzzle is trial and error. He tries one piece after another until the puzzle is put together. After playing with the puzzle for several days, the child can put the puzzle together without a mistake. He has learned by trial and error with the aid of memory and association.

Much of our early learning is by trying many things before we learn the right way and can do a

task without mistakes.

Learning to walk, eat, roller skate, or ride a bicycle are examples of things you probably learned by trial and error. Many of the things you first learn by trial and error later become habit as you gain in efficiency.

Even a scientist uses trial and error in conducting research. One famous example was Paul Ehrlich, a German scientist looking for treatment of a disease. He finally discovered what he needed. He called it “606,” because that was the number of drugs he had tested.



Try this experiment with someone.



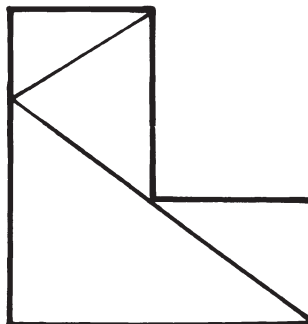
These supplies are needed:

piece of card stock or heavy paper (10 cm x 10 cm)
scissors



Follow these directions. Place a check mark in each box when the step is completed.

- ☐ 1. Mark out a letter *L* as shown that is 4 cm wide. The “leg” and “foot” should each be 10 cm long.
- ☐ 2. Draw lines on the *L* as shown and cut out the pieces.



- ☐ 3. Shuffle the pieces, give them to someone to put the four pieces back together. Time this task. Record the time in 1.37.
- ☐ 4. Shuffle the pieces and repeat the task and timing for ten trials. Record each in 1.37.
- ☐ 5. Repeat Steps 3 and 4 with other students or adults. Record each in 1.37. Put the names of each person at the top of their data column.



My observations and conclusions.

- 1.37 Data of persons and time to put the puzzle together.

Trial					
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

- 1.38 What can you conclude from your data? _____

Routine learning. Routine learning is the third type of learned response. Routine learning is the association of symbols with meaning. For example, in the first grade you learned that + means add and – means subtract. Symbols may be words, objects, pictures, letters on a typewriter, or numbers. Your memory stores the meaning of these symbols. The information your teacher gives you, the sermons your ministers preach,

your day-to-day experiences, and the problems you solve and verses you memorize are all a part of routine learning. Practice, repetition, and review reinforce routine learning.

Isn't that what you are doing while you study this LIGHTUNIT? Practicing, repeating, and reviewing. Without your brain and marvelous nervous system such learning would be impossible.



Do these activities.

- 1.39 Look up Psalm 8:3 through 9. Copy the verses here.
- a. Verse 3 _____

 - b. Verse 4 _____

 - c. Verse 5 _____

 - d. Verse 6 _____

 - e. Verse 7 _____

 - f. Verse 8 _____

 - g. Verse 9 _____

- 1.40 Reread Verses 3 and 4. What do you think they mean? _____

- 1.41 Reread verses 6, 7, and 8. What is the position of mankind compared to animals? _____

- 1.42 What is man responsible to do? _____

- 1.43 What are three types of learned responses? _____ ,
_____, and _____
- 1.44 Which learned response may become habit as you gain in efficiency? _____

- 1.45 What type of learning takes place every day at school? _____
- 1.46 What are the brain's two ways of making learning possible? _____
and _____
-



Review the material in this section to prepare for the Self Test. The Self Test will check your understanding of this section. Any items you miss on this test will show what areas you need to restudy.