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15–2 The Brain and Its Functions

The human brain is divided into three different parts. Each part is specialized. Each part has a job to perform that is different from the other parts. The brain is even more specialized in that specific brain sides control only specific body sides.

INTERPRETATION

OBJECTIVES

In this exercise, you will:

a. identify and label the three brain areas.
b. determine the jobs of certain brain areas.
c. match brain areas with their corresponding areas of body control.

KEYWORDS

Define the following keywords:

cerebellum _____

cerebrum _____

involuntary _____

medulla _____

voluntary _____

MATERIALS

#2 pencil colored pencils: red, green, blue, gray, and yellow

PROCEDURE

Part A. Control Areas of the Brain

1. Examine Figure 1. This shows a side view of the human brain. Label the brackets correctly to show the brain's three parts or areas. Use the following labels: medulla, cerebrum, and cerebellum.
2. Label the functions of certain brain parts by using the following labels:
   - A. vision center
   - B. speech center
   - C. sensation of body pain
   - D. muscle control of body
   - E. hearing center
   - F. heartbeat center
   - G. coordination center for body muscle
   - H. smell center
   - I. personality center
3. Still using Figure 1, color in the voluntary parts of the brain with a red pencil. Color the involuntary parts blue.

FIGURE 1. Side view of the human brain

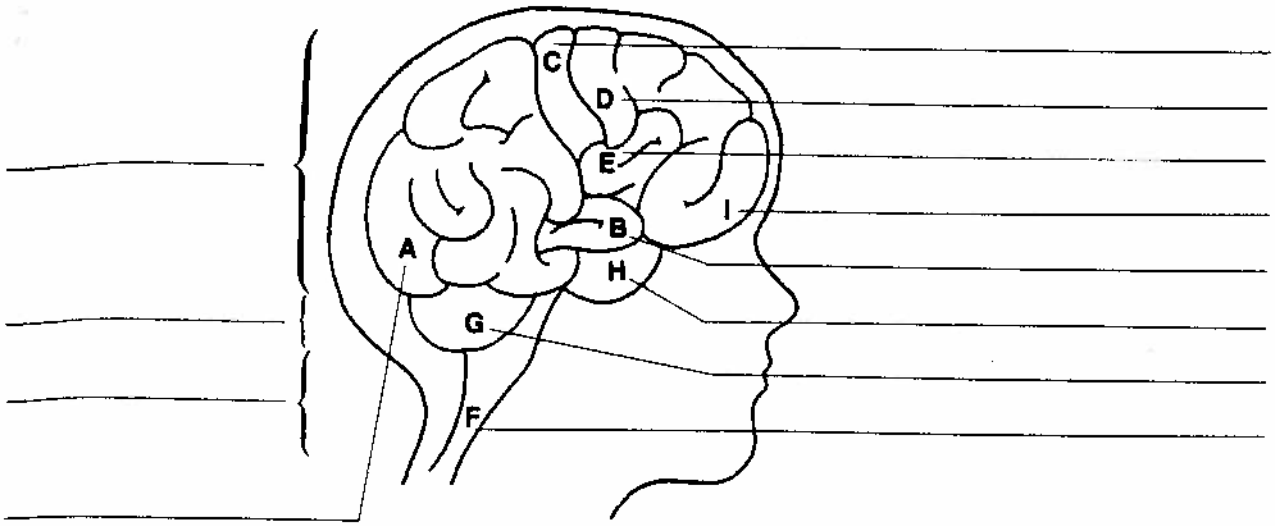
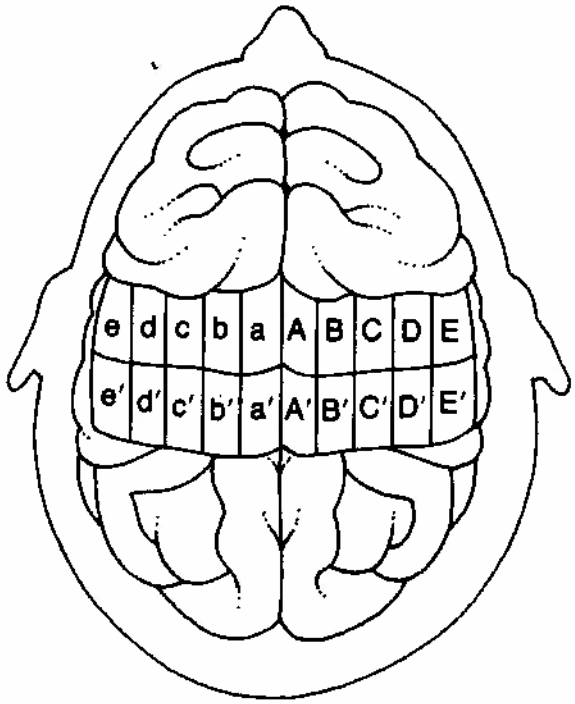


FIGURE 2. The cerebrum



left side of cerebrum right side of cerebrum

Part B. How the Brain Controls the Body

1. Examine the top view of the cerebrum in Figure 2. Note that the cerebrum is divided into left and right sides. Each side has been marked for you.

2. Locate and examine the two front views of the body in Figure 3. Note that in these views the left and right sides are reversed (this is because they are front views). The body views are marked either "sensation of body pain" or "muscle control of body." Muscle control and body pain are controlled by certain brain areas. The brain area controlling this and the corresponding areas on the body are marked with similar letters.

3. Match the brain areas of Figure 2 with their corresponding body areas of Figure 3 by coloring in parts of the figures as follows:

A–solid red	A′–stripe red	a–crisscross red	a′–dot red
B–solid blue	B′–stripe blue	b–crisscross blue	b′–dot blue
C–solid green	C′–stripe green	c–crisscross green	c′–dot green
D–solid yellow	D′–stripe yellow	d–crisscross yellow	d′–dot yellow
E–solid gray	E′–stripe gray	e–crisscross gray	e′–dot gray

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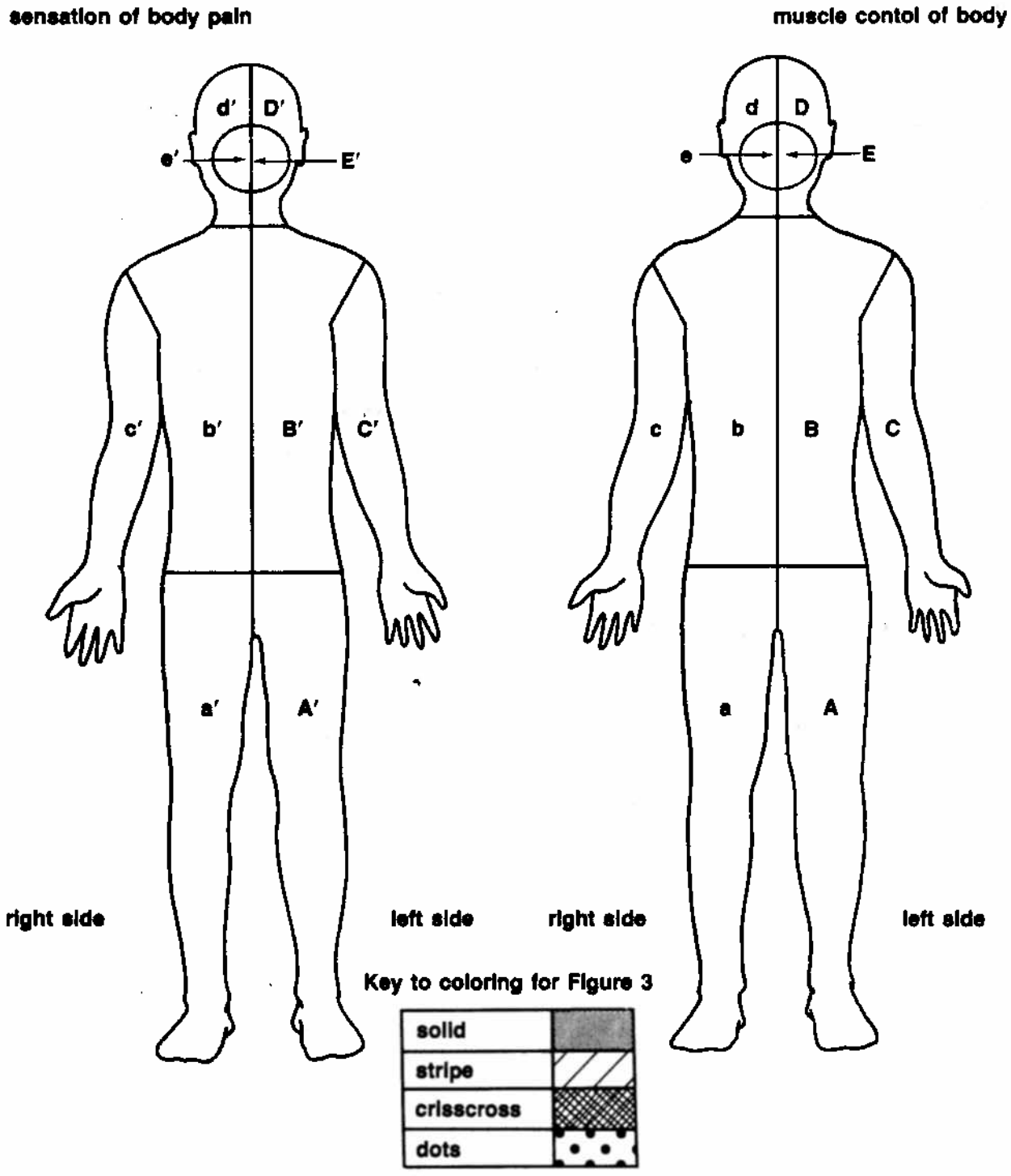
FIGURE 3. Front views of the human body



QUESTIONS

1. Which brain area is the largest?_____
2. What side and functions are part of body areas

   a. A–E?_____

   b. a–e?_____

3. On what brain side of the cerebrum do the following appear:

   a. A–E?_____

   b. a–e?_____

4. By using your answers to questions 2 and 3, explain how brain side and body muscle control are related._____

   _____

5. What side and function are part of body areas

   a. A′–E′?_____

   b. a′–e′?_____

6. On what brain side of the cerebrum do the following appear:

   a. A′–E′?_____

   b. a′–e′?_____

7. By using your answers to questions 5 and 6, explain how brain side and body sensation of pain are related._____

   _____

8. Circle the answer that correctly completes the following statements:
   a. Body areas A–E for muscle movement go from (top to bottom, bottom to top) of the body.
   b. Brain areas A–E for control of muscle movement go from (center to right side, right side to center) of the brain.
   c. Body areas A′–E′ for sensation of pain go from (top to bottom, bottom to top) of the body.
   d. Brain areas a′–e′ for sensation of pain go from (center to left side, left side to center) of the brain.

9. A stroke or cardiovascular accident results when blood vessels in the brain burst. This results in damage to the brain area near the broken blood vessel. Using Figure 2 as a guide, predict how a person would be affected if they suffer a stroke in

   a. area A._____

   b. area C._____

   c. area E._____

   d. area D′._____

   e. area b._____

   f. area e′._____