2. Figure 12.2 is a diagram of the right lateral view of the human brain. First, match the letters on the diagram with the following list of terms and insert the appropriate letters in the answer blanks. Then, select different colors for each of the areas of the brain with a color-coding circle and use them to color the diagram. If an identified area is part of a lobe, use the color you selected for the lobe but use stripes for that area.

- D 1. Frontal lobe
- L 2. Parietal lobe
- F 3. Temporal lobe
- C 4. Precentral gyrus
- K 5. Parieto-occipital fissure
- B 6. Postcentral gyrus
- E 7. Lateral fissure
- A 8. Central sulcus
- I 9. Cerebellum
- H 10. Medulla
- J 11. Occipital lobe
- G 12. Pons
3. Fill in the table below by indicating the adult brain structures formed from each of the secondary brain vesicles and the adult neural canal regions. Some of that information has already been entered.

<table>
<thead>
<tr>
<th>Secondary brain vesicle</th>
<th>Adult brain structures</th>
<th>Neural canal regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telencephalon</td>
<td><strong>Cerebrum</strong></td>
<td>Lateral ventricles</td>
</tr>
<tr>
<td>Diencephalon</td>
<td>Diencephalon</td>
<td></td>
</tr>
<tr>
<td>Mesencephalon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metencephalon</td>
<td>Brain stem: pons; cerebellum</td>
<td></td>
</tr>
<tr>
<td>Myelencephalon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Figure 12.3 illustrates a “see-through” brain showing the positioning of the ventricles and connecting canals or apertures. Correctly identify all structures having leader lines by using the key choices provided below. One of the lateral ventricles has already been identified. Color the spaces filled with cerebrospinal fluid blue.

**Key Choices**

A. Anterior horn  
B. Central canal  
C. Cerebral aqueduct  
D. Fourth ventricle  
E. Inferior horn  
F. Interventricular foramen  
G. Lateral aperture  
H. Third ventricle

![Figure 12.3](image-url)
5. Figure 12.4 shows a left lateral view of the brain with some of its functional areas indicated by numbers. These areas are listed below. Identify each cortical area by its corresponding number on the diagram. Color the diagram as you wish.

4 Primary motor cortex
6 Premotor cortex
10 Visual cortex
2 Prefrontal cortex
8 Frontal eye field
9 Posterior association area

3 Primary somatosensory cortex
7 Somatosensory association area
5 Auditory cortex
1 Broca’s area
11 Wernicke’s area

Figure 12.4
6. Some of the following brain structures consist of gray matter; others are white matter. Write G (for gray) or W (for white) as appropriate.

G
1. Cortex of cerebellum

W
2. Internal capsule

W
3. Anterior commissure

W
4. Medial lemniscus

W
5. Pyramids

G
6. Olives

G
7. Thalamic nuclei

W
8. Cerebellar peduncle

7. If a statement is true, write the letter T in the answer blank. If a statement is false, correct the underlined word(s) and write the correct word(s) in the answer blank.

postcentral
1. The primary somatosensory area of the cerebral hemisphere(s) is found in the precentral gyrus.

temporal
frontal
2. Cortical areas involved in audition are found in the occipital lobe.

Broca
3. The primary motor area in the temporal lobe is involved in the initiation of voluntary movements.

left
4. The specialized motor speech area is located at the base of the precentral gyrus in an area called Wernicke's area.

T
precentral
premotor
5. The right cerebral hemisphere receives sensory input from the right side of the body.

fingertips
6. The pyramidal tract is the major descending voluntary motor tract.

somatosensory
7. The primary motor cortex is located in the postcentral gyrus.

prefrontal
8. Centers for control of repetitious or stereotyped motor skills are found in the primary motor cortex.

9. The largest parts of the motor humunculi are the lips, tongue, and toes.

somatosensory
10. Sensations such as touch and pain are integrated in the primary sensory cortex.

Occipital
11. The primary visual cortex is in the frontal lobe of each cerebral hemisphere.

T
12. In most humans, the area that controls the comprehension of language is located in the left cerebral hemisphere.

prefrontal
13. Elaboration of the visual cortex sets humans apart from other animals.
14. Complex sensory memory patterns are stored in an area called the general interpretation area.

15. Areas in the cerebral hemisphere opposite the ones containing Broca's and Wernicke's areas are centers for cognitive language.

16. Cerebral dominance designates the hemisphere that is dominant for memory.

17. The right cerebral hemisphere of left-handed humans is usually involved with intuition, poetry, and creativity.

8. Using the key choices, select the terms identified in the following descriptions by inserting the appropriate letters in the answer blanks.

**Key Choices**

A. Basal nuclei  
B. Brain stem  
C. Cerebellum  
D. Cerebral hemispheres  
E. Cortex  
F. Diencephalon  
G. Septum pellucidum  
H. Ventricles  
I. White matter

1. The four major subdivisions of the adult brain

2. Contain cerebrospinal fluid

3. Masses of gray matter embedded deep within the cerebral white matter

4. Myelinated fiber tracts

5. Consists of the midbrain, pons, and medulla

6. Separates the lateral ventricles

7. Thin layer of gray matter on outer surface of cerebral hemispheres and cerebellum

8. Account for more than 60% of the total brain weight

9. Consists of the hypothalamus, thalamus, epithalamus, and retinas of the eyes
9. Figure 12.5 is a diagram of the sagittal view of the human brain. First, match the letters on the diagram with the following list of terms and insert the appropriate letters in the answer blanks. Then, color the brain stem areas blue and the areas where cerebrospinal fluid is found yellow.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>1. Cerebellum</td>
</tr>
<tr>
<td>N</td>
<td>2. Cerebral aqueduct</td>
</tr>
<tr>
<td>Q</td>
<td>3. Cerebral hemisphere</td>
</tr>
<tr>
<td>O</td>
<td>4. Cerebral peduncle</td>
</tr>
<tr>
<td>B</td>
<td>5. Choroid plexus</td>
</tr>
<tr>
<td>F</td>
<td>6. Corpora quadrigemina</td>
</tr>
<tr>
<td>A</td>
<td>7. Corpus callosum</td>
</tr>
<tr>
<td>D</td>
<td>8. Fornix</td>
</tr>
<tr>
<td>M</td>
<td>9. Fourth ventricle</td>
</tr>
<tr>
<td>I</td>
<td>10. Hypothalamus</td>
</tr>
<tr>
<td>K</td>
<td>11. Medulla oblongata</td>
</tr>
<tr>
<td>G</td>
<td>12. Optic chiasma</td>
</tr>
<tr>
<td>P</td>
<td>13. Pineal body</td>
</tr>
<tr>
<td>H</td>
<td>14. Pituitary gland</td>
</tr>
<tr>
<td>J</td>
<td>15. Pons</td>
</tr>
<tr>
<td>C</td>
<td>16. Thalamus (interthalamic adhesion)</td>
</tr>
<tr>
<td>E</td>
<td>17. Third ventricle</td>
</tr>
</tbody>
</table>

Figure 12.5
10. Figure 12.6 is a diagram of a frontal section through the brain, as indicated on the orientation diagram. Label the ventricles and the longitudinal fissure, both of which are indicated by leader lines. Color code and color the structures listed below.

- Cerebral cortex
- Basal nuclei
- Thalamus
- Cerebral white matter
- Corpus callosum
- Internal capsule
- Hypothalamus
- Septum pellucidum
11. Referring back as necessary to the brain areas listed in Exercise 9, match the appropriate brain structures with the following descriptions. Insert the terms selected in the answer blanks.

1. Site of regulation of water balance, body temperature, rage, and pain centers; the main visceral (autonomic) center of brain

2. Reflex centers involved in regulating respiratory rhythm in conjunction with lower brain stem centers

3. Responsible for the regulation of posture and coordination of skeletal muscle movements

4. Important relay station for afferent fibers, traveling to the sensory cortex for interpretation

5. Contains autonomic centers that regulate blood pressure and respiratory rhythm, as well as coughing and sneezing centers

6. Midbrain area consisting of large, descending motor tracts

7. Influences body rhythms; interacts with the biological clock

8. Location of middle cerebellar peduncles

9. Locations of visual and auditory reflex centers

12. In the horizontal section shown in Figure 12.7 (see plane of cut in inset), identify by color coding and coloring, the structures listed below:

- Caudate nucleus
- Claustrum
- Corpus callosum
- Choroid plexus
- Pineal body
- Putamen
- Thalamus

Then, using the leader lines provided, correctly identify the fornix, inferior horn of the lateral ventricle, third ventricle, insula, internal capsule, and septum pel- lucidum.
Figure 12.7
13. Figure 12.8 shows the brain stem and associated diencephalon. Using the key choices, label all structures provided with leader lines. Then, color code and color the following structures or groups of structures.

- All cranial nerves
- Medulla oblongata
- Midbrain
- Diencephalon
- Pons
- Infundibulum

**Key Choices**

A. Abducens nerve (VI)
B. Accessory nerve (XI)
C. Cerebral peduncle
D. Decussation of the pyramids
E. Facial nerve (VII)
F. Glosopharyngeal nerve (IX)
G. Hypoglossal nerve (XII)
H. Infundibulum
I. Lateral geniculate body
J. Mammillary body
K. Oculomotor nerve (III)
L. Optic chiasma
M. Optic nerve (II)
N. Optic tract
O. Pons
P. Spinal chord
Q. Thalamus
R. Trigeminal nerve (V)
S. Vagus nerve (X)
T. Vestibulocochlear nerve (VIII)