Language Areas
- Located in a large area surrounding the left (or language-dominant) lateral sulcus
- Major parts and functions:
  - Wernicke’s area – sounding out unfamiliar words
  - Broca’s area – speech preparation and production
  - Lateral prefrontal cortex – language comprehension and word analysis
  - Lateral and ventral temporal lobe – coordinate auditory and visual aspects of language

General (Common) Interpretation Area
- Ill-defined region including parts of the temporal, parietal, and occipital lobes
- Found in one hemisphere, usually the left
- Integrates incoming signals into a single thought
- Involved in processing spatial relationships

Visceral Association Area
- Located in the cortex of the insula
- Involved in conscious perception of visceral sensations

Lateralization of Cortical Function
- Lateralization – each hemisphere has abilities not shared with its partner
- Cerebral dominance – designates the hemisphere dominant for language
- Left hemisphere – controls language, math, and logic
- Right hemisphere – controls visual-spatial skills, emotion, and artistic skills

Diencephalon
- Central core of the forebrain
- Consists of three paired structures – thalamus, hypothalamus, and epithalamus
- Encloses the third ventricle
### Thalamus
- Paired, egg-shaped masses that form the superolateral walls of the third ventricle
- Connected at the midline by the intermediate mass
- Contains four groups of nuclei – anterior, ventral, dorsal, and posterior
- Nuclei project and receive fibers from the cerebral cortex

### Thalamic Function
- Sensual afferent impulses converge and synapse in the thalamus
- Impulses of similar function are sorted out, edited, and relayed as a group
- All inputs ascending to the cerebral cortex pass through the thalamus
- Mediates sensation, motor activities, cortical arousal, learning, and memory

### Hypothalamus
- Located below the thalamus, it caps the brainstem and forms the inferolateral walls of the third ventricle

### Hypothalamic Function
- Regulates blood pressure, rate and force of heartbeat, digestive tract motility, rate and depth of breathing, and many other visceral activities
- Perception of pleasure, fear, and rage
- Maintains normal body temperature
- Regulates feelings of hunger and satiety
- Regulates sleep and the sleep cycle

### Endocrine Functions of the Hypothalamus
- Releasing hormones control secretion of hormones by the anterior pituitary

### Epithalamus
- Most dorsal portion of the diencephalon; forms roof of the third ventricle
- Pineal gland – extends from the posterior border and secretes melatonin
  - Melatonin – a hormone involved with sleep regulation, sleep-wake cycles, and mood
- Choroid plexus – a structure that secretes cerebral spinal fluid (CSF)
Brain Stem
- Consists of three regions – midbrain, pons, and medulla oblongata
- Similar to spinal cord but contains embedded nuclei
- Controls automatic behaviors necessary for survival
- Provides the pathway for tracts between higher and lower brain centers
- Associated with 10 of the 12 pairs of cranial nerves

The Cerebellum
- Located dorsal to the pons and medulla
- Protrudes under the occipital lobes of the cerebrum
- Makes up 11% of the brain’s mass
- Provides precise timing and appropriate patterns of skeletal muscle contraction
- Cerebellar activity occurs subconsciously