Mental processes and the brain

- Mental processes are represented as activation patterns across neurons in the brain
- Neurons are cells that signal each other
  - A neuron makes a yes/no decision whether to propagate an electrochemical signal
  - There are 100s of billions of neurons, so the brain can signal in very complex ways
Cortical regions

Superior (dorsal)

Inferior (ventral)

Cor. cal regions
Anterior (rostral)
Posterior (caudal)

Superior aspect

Longitudinal fissure
Sulcus
Gyrus

Corpus callosum (hard body)
Cortex (bark): ~3mm
Axons (neuron outputs)

Inferior aspect

Lateral fissure
Cerebellum

Lateral vs. sagittal views

Sagittal = split along longitudinal fissure

Primary motor, somatosensory areas

Primary motor projection area
Primary somatosensory projection area
Primary auditory cortex
Primary visual cortex
Key points:
- Which of the green and blue areas is which
- More neural tissue = more sensation / control
- Another map: nearby areas in the body map to nearby areas in brain

Primary motor, somatosensory areas

Association areas
Those cortical areas other than sensory/motor
Integrate and connect information

Brains across species

Language areas
In most people, these language areas are left-lateralized

Split-brain effects
(Fig. 3.31)
The person is looking straight ahead

Person can perceive the fork picture, and say “fork”
Person can perceive the physical spoon by feel, with their left hand

Face recognition

Fusiform face area