Cognitive functioning

Q: What is cognitive functioning?

How we process information

How we think

A: Thinking

How we remember things

How we make decisions

Cognitive Functioning

- Crucial to success in most classroom settings:
  - For the direct learning of skills such as reading, maths and capacity to reason about abstract ideas
  - But also for sitting at a desk for long periods, avoiding distractions and doing homework
- Cognition is strongly linked to educational achievement

We will investigate cognitive functioning in two ways:

1. Using short computer games and measuring how quickly and accurately you complete these

2. By asking questions about thoughts, feelings, how well you remember things.

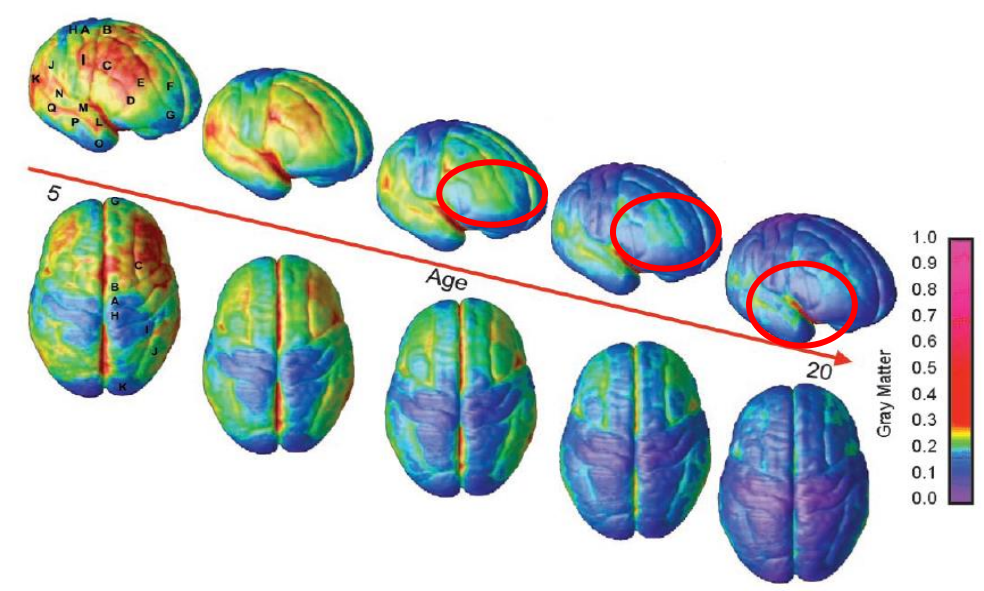
What aspects of cognition will we investigate?

- Higher level cognitive functions
  - Language understanding
  - Attention
  - Planning
  - Memory

- And lower level cognition
  - Visual attention
  - Response speed

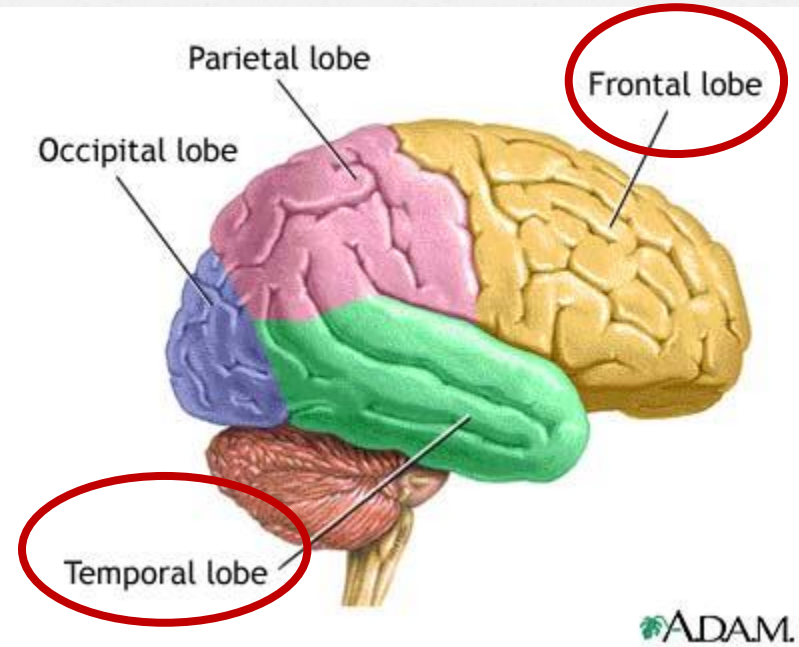
Brain structure development during adolescence

- The **cerebral cortex** is the outermost layer of the brain. The figure below shows the thickness of the cerebral cortex – the more blue/purple, the thinner (and more adult like) the cortex is.



- The first regions to go blue are sensory motor regions
- The last regions to go blue are the **lateral frontal and temporal lobes** (highlighted with the circles).

The Human Brain – which areas are we interested in?



- **Frontal and temporal lobes** continue to **develop and mature during adolescence** and are the areas of the brain closest to a mobile phone when held to the ear.

The Human Brain – Which areas are we interested in?

- The **prefrontal cortex** is located in the front portion of the frontal lobe.
  - This area supports specific cognitive functions which can be grouped under the term ‘executive functioning’ or ‘cognitive functioning’.
  - They include things like working memory, attention, reasoning, flexibility, inhibition, and problem solving.

- The **lateral temporal cortex** is located in the temporal lobe and lies just behind the ears (where you hold your phone during a call).
  - This area of the brain supports functions such as speech and auditory language comprehension (i.e. understanding and processing spoken language)