

# Class 12

## Working memory and cognitive control

Monday

25<sup>th</sup> September 2022

<b>X</b>	<b>E</b>	<b>G</b>	<b>K</b>
<b>P</b>	<b>L</b>	<b>R</b>	<b>D</b>
<b>I</b>	<b>N</b>	<b>C</b>	<b>A</b>

How many letters do you remember?

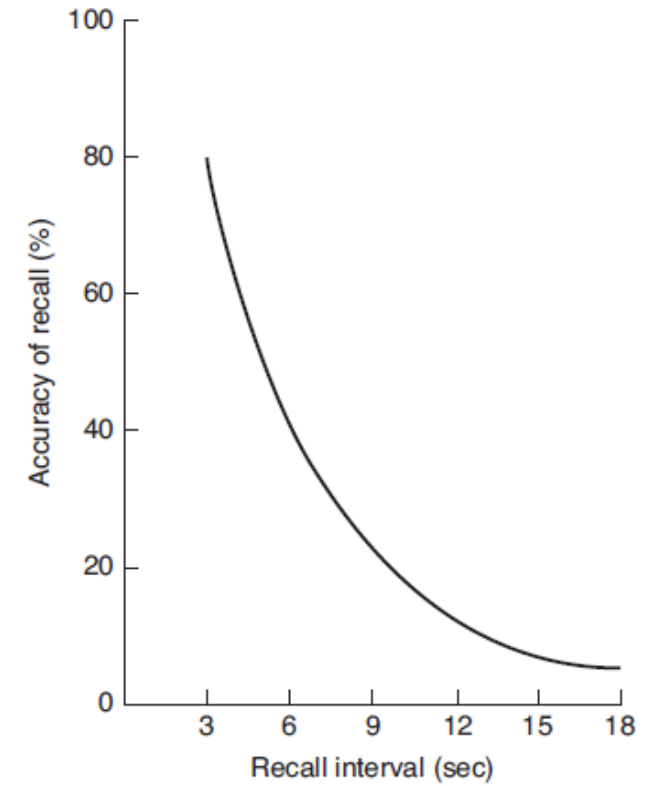
List of words

DRUM
CURTAIN
FARMER
SCHOOL
MOON
GARDEN
PARENT
HAT
NOSE
BELL
COFFEE
TURKEY
COLOR
HOUSE
RIVER

# Sensory memory

Auditory (echoic) sensory memory

Visual (iconic) sensory memory



# Primacy & Recency effect

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*Try to remember the following list of digits*

*1 9 2 5 4 9 8 1 1 2 1*

*Now try to remember them in groups*

*19 25 49 81 121*

*Now memorize them using a strategy*

*$1^2$   $3^2$   $5^2$   $7^2$   $9^2$   $11^2$*

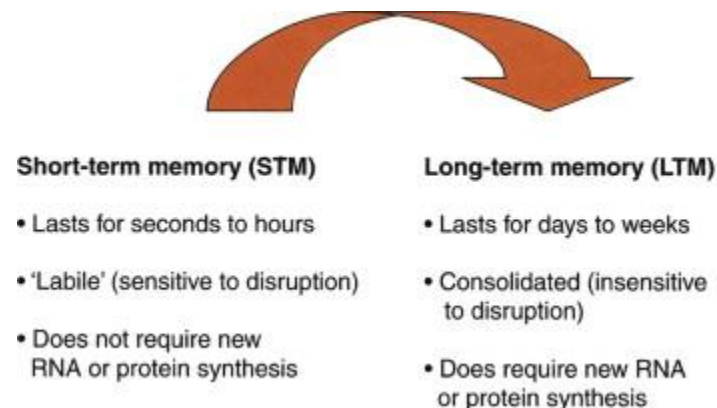
# Chunking information helps retention

- Indian phone numbers – 98672 61423
- American phone numbers – 234-456-867

# Short-Term Memory (part 1)

- William James: memory as being of limited capacity, effortlessly available, and fleeting in contrast to long-term memory

STM	LTM
Active contents of consciousness	Not currently in consciousness
Rapidly accessed	Accessed more slowly
Limited in capacity	Unlimited in capacity
Forgotten quickly	Forgotten more slowly





IS  $(5 \times 3) + 4 = 17$ ? BOOK

IS  $(5 \times 3) + 4 = 17$ ? BOOK

IS  $(6 \times 2) - 3 = 8$ ? HOUSE

IS  $(5 \times 3) + 4 = 17$ ? BOOK

IS  $(6 \times 2) - 3 = 8$ ? HOUSE

IS  $(4 \times 4) - 4 = 12$ ? JACKET

IS  $(5 \times 3) + 4 = 17?$  BOOK

IS  $(6 \times 2) - 3 = 8?$  HOUSE

IS  $(4 \times 4) - 4 = 12?$  JACKET

IS  $(3 \times 7) + 6 = 27?$  CAT

IS  $(5 \times 3) + 4 = 17?$  BOOK

IS  $(6 \times 2) - 3 = 8?$  HOUSE

IS  $(4 \times 4) - 4 = 12?$  JACKET

IS  $(3 \times 7) + 6 = 27?$  CAT

IS  $(4 \times 8) - 2 = 31?$  PEN

IS  $(5 \times 3) + 4 = 17?$  BOOK

IS  $(6 \times 2) - 3 = 8?$  HOUSE

IS  $(4 \times 4) - 4 = 12?$  JACKET

IS  $(3 \times 7) + 6 = 27?$  CAT

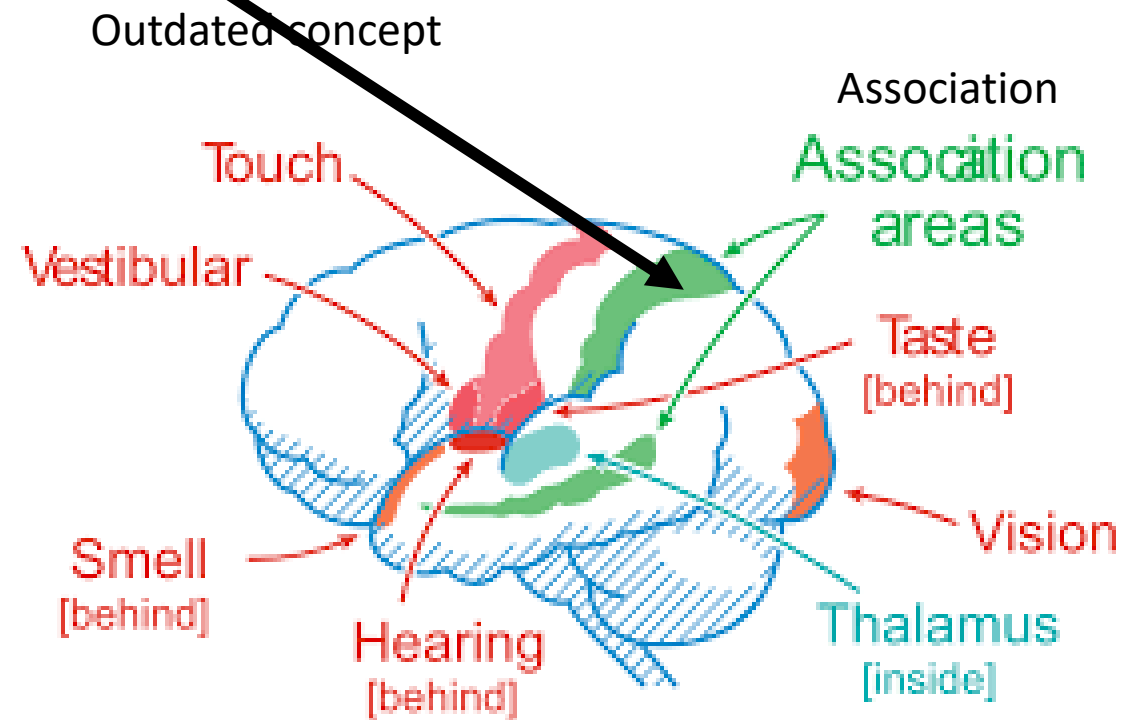
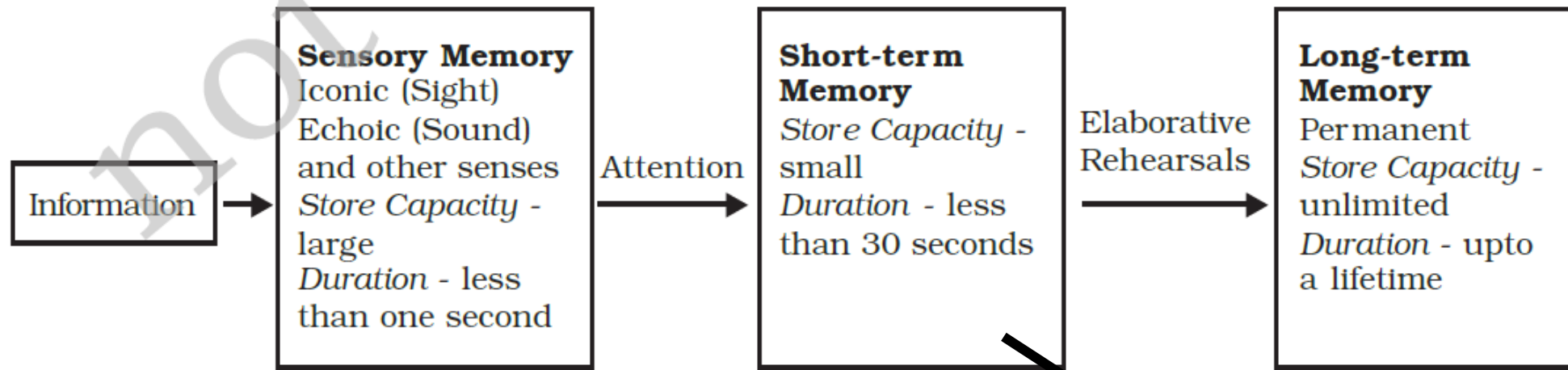
IS  $(4 \times 8) - 2 = 31?$  PEN

IS  $(9 \times 2) + 6 = 24?$  WATER

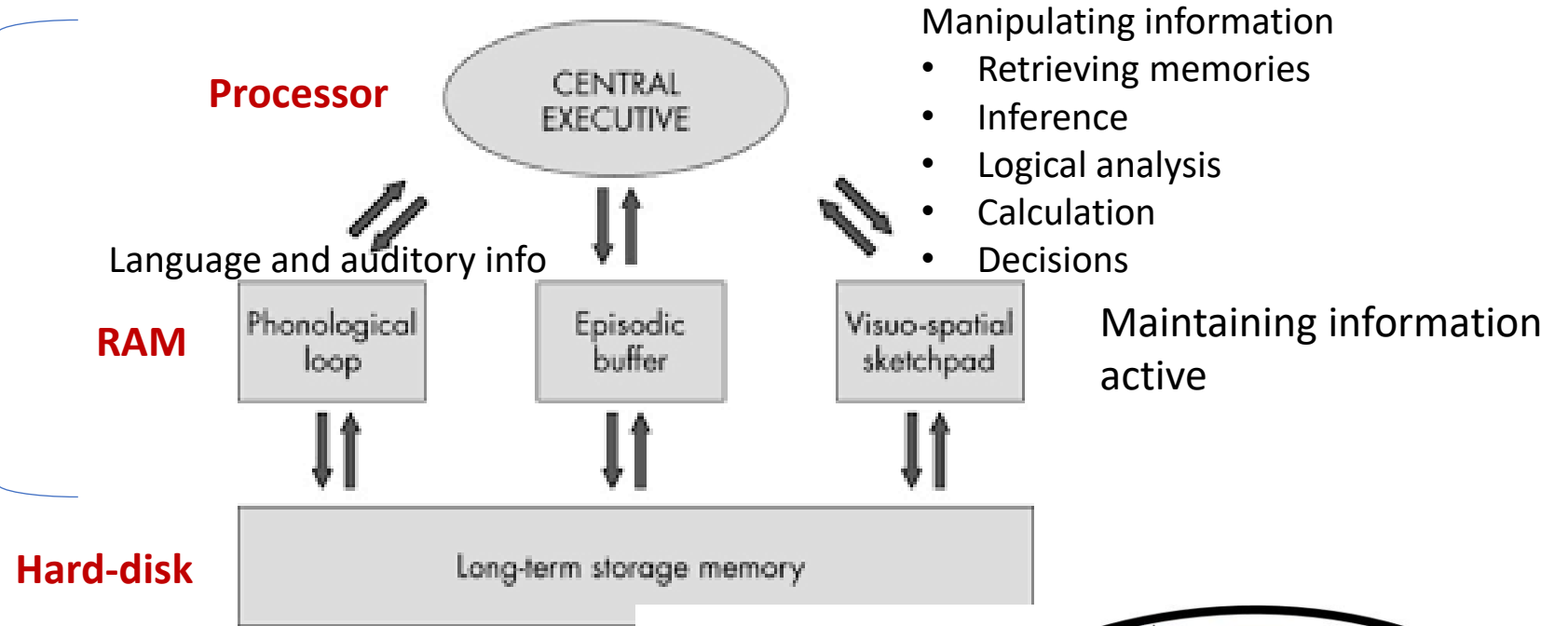
List the words in order

- remembering a phone number between the time of hearing it and dialling it
- figuring a tip (15% of total)
- holding driving directions in mind until you get to the landmarks you've been told
- possible sequences of moves in a chess game

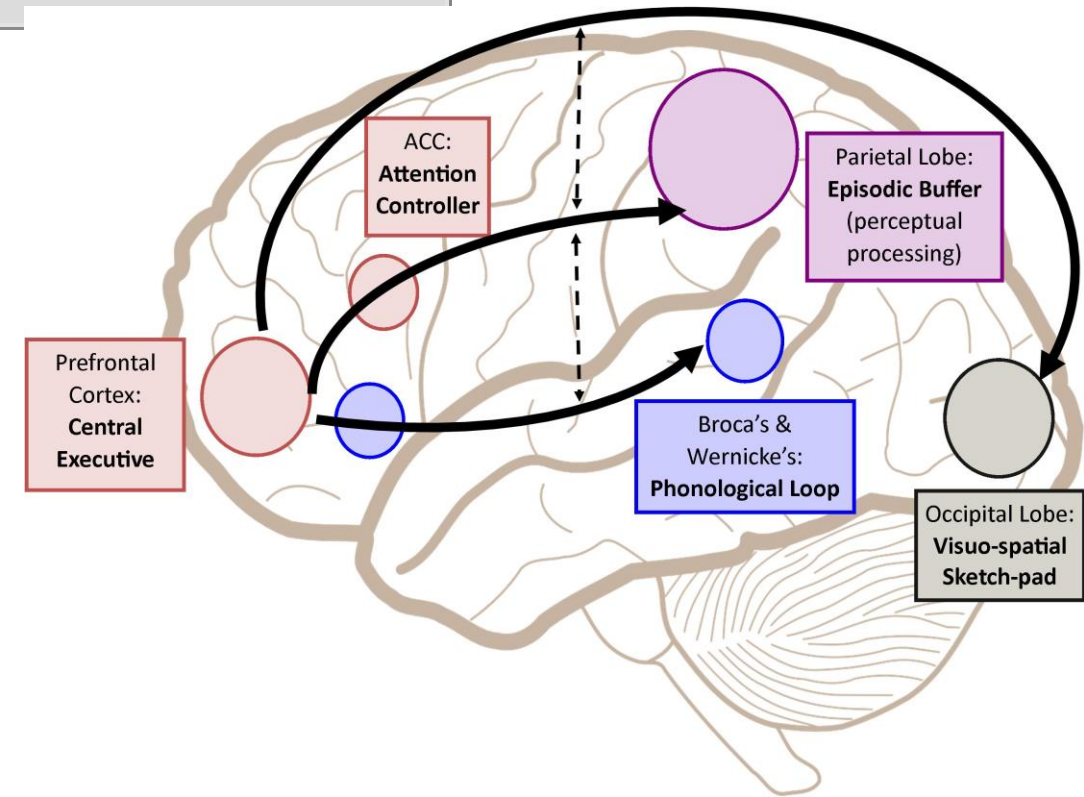
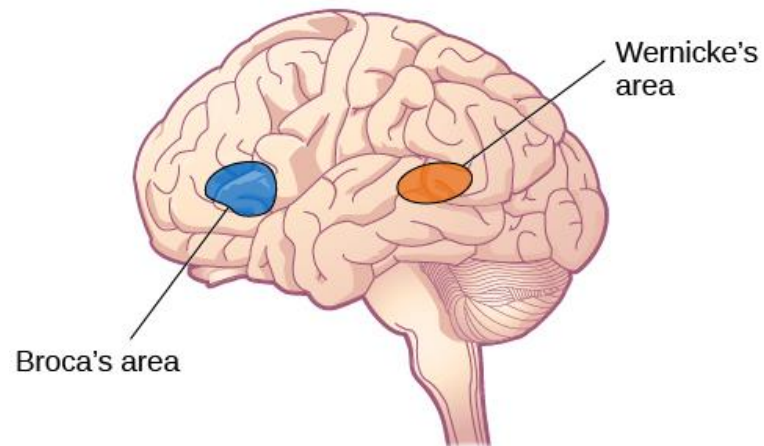


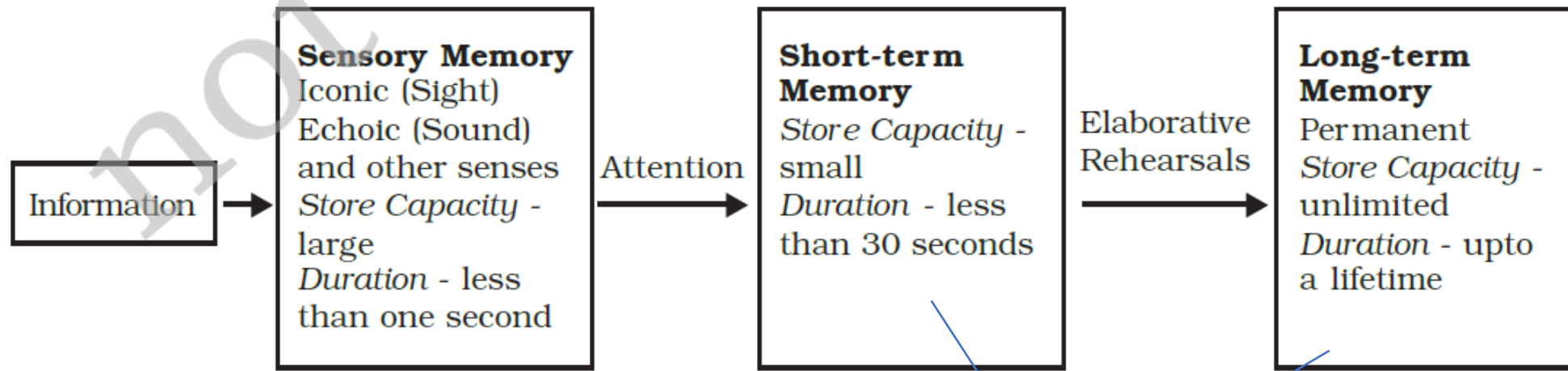


Working memory



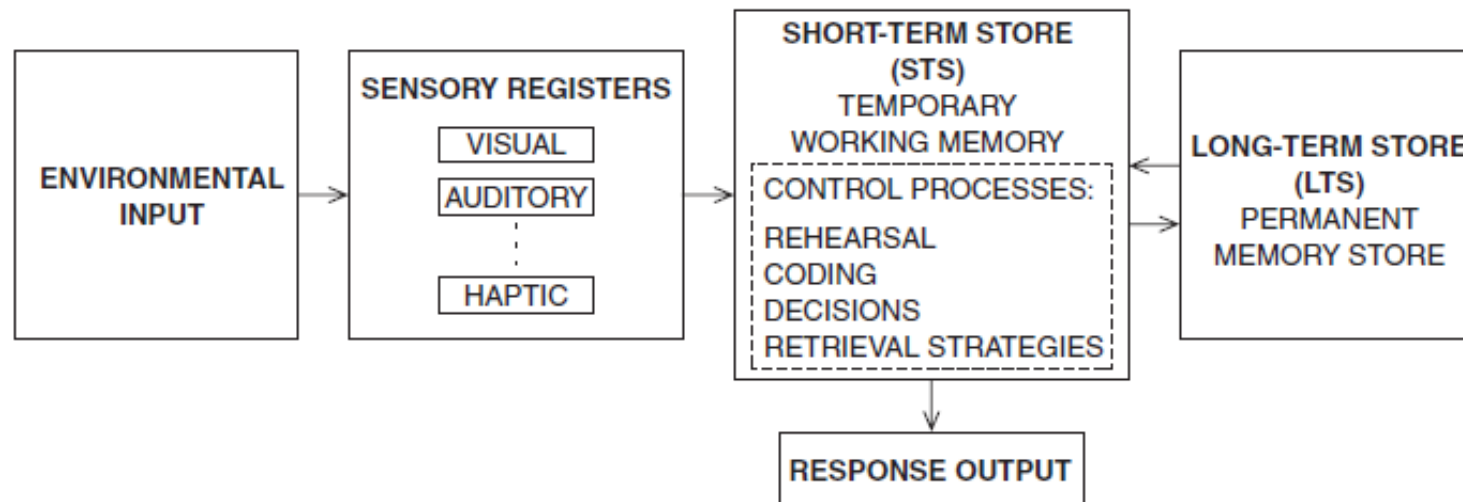
## Allan Baddeley's working memory model

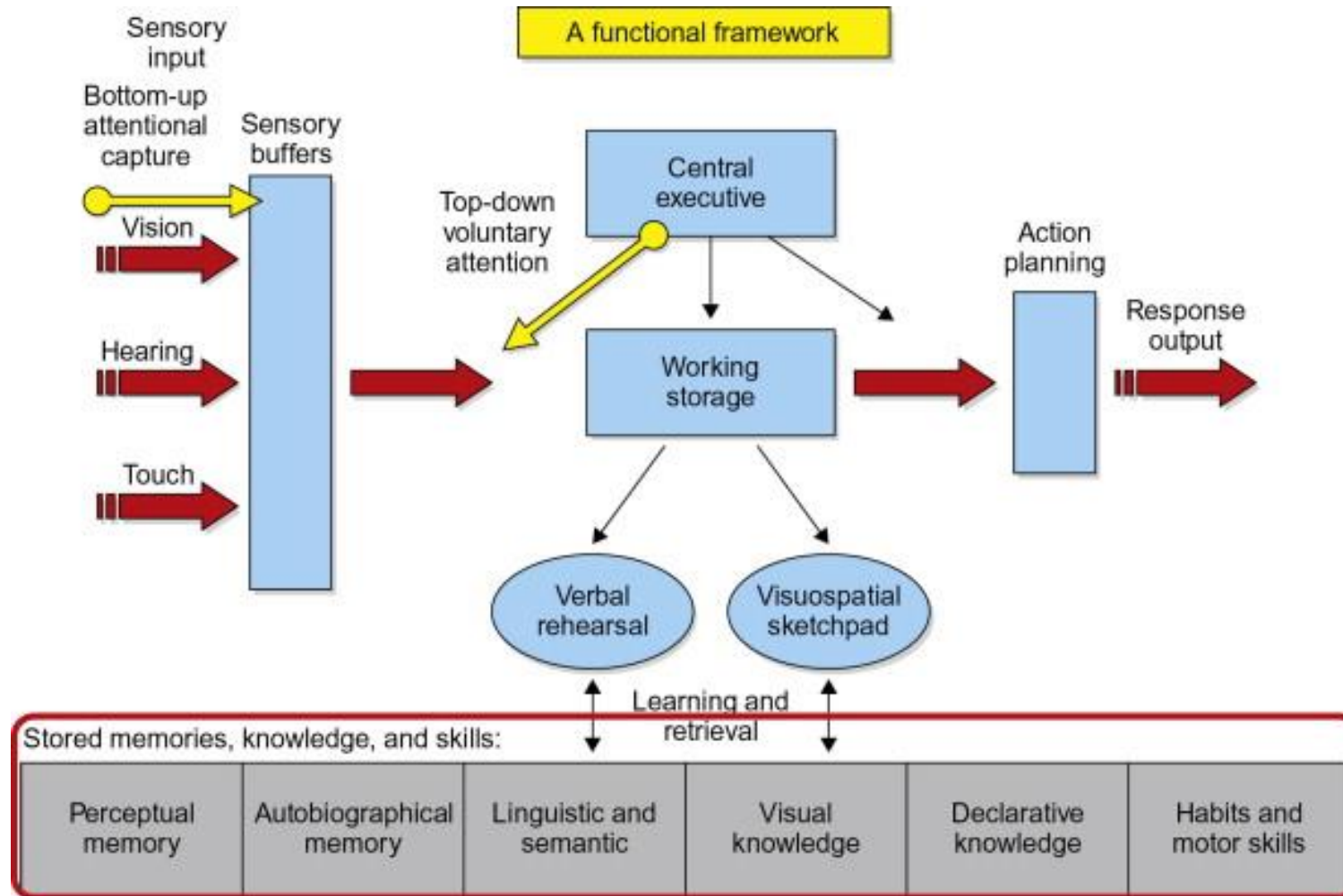




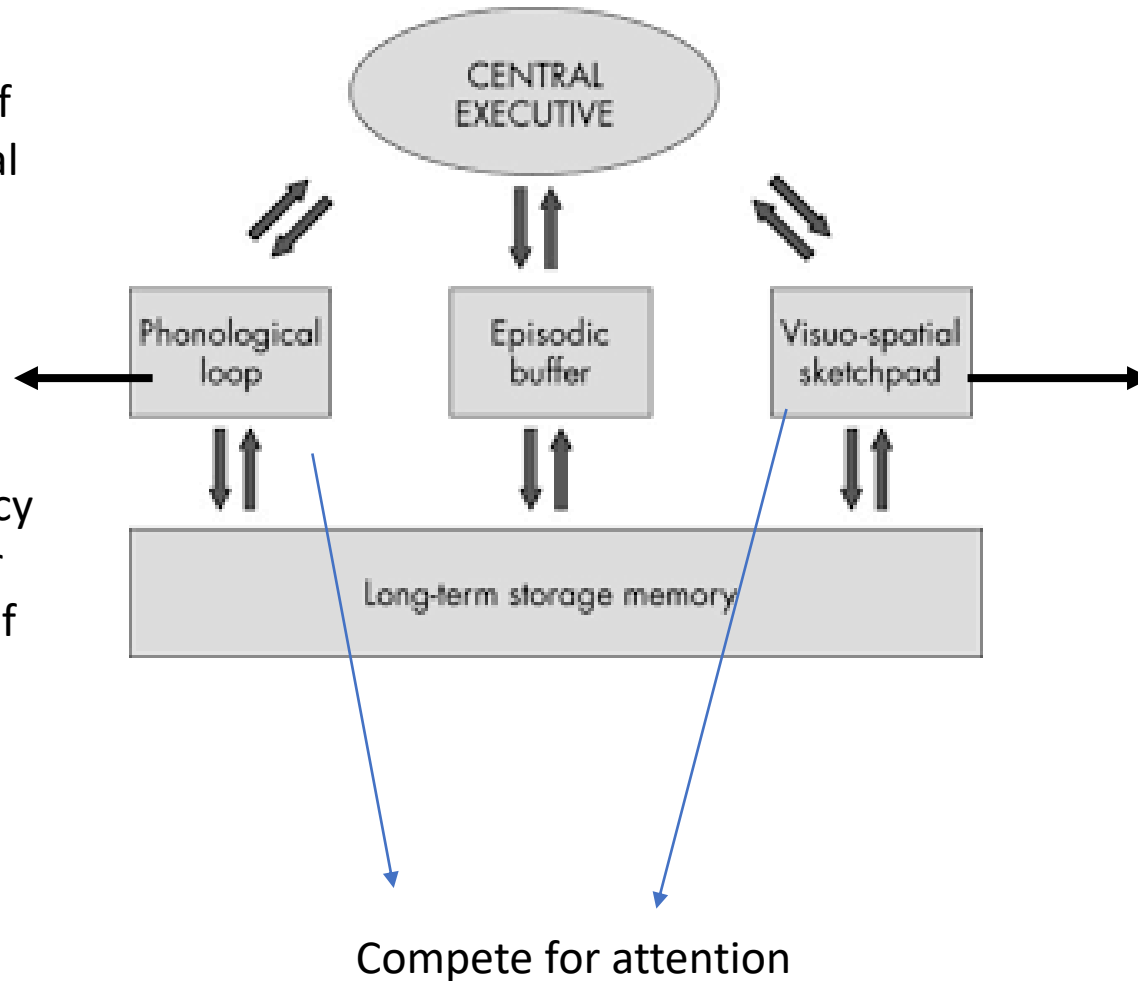
Working memory

**Working memory:** the active and temporary representation of information that is maintained for the short term, available for manipulation





- Without rehearsal, most people retain about 2 seconds' worth of information in their phonological memory
- Internal, unspoken speech used during rehearsal is vital to the phonological loop and verbal working memory
- **Word-length effect:** the tendency for a person to remember fewer words from a list as the length of the words increases



- The visuospatial sketchpad is a mental workspace for storing and manipulating visual and spatial information
- Limited capacity similar to the phonological loop, but these capacities are independent of one another
- Dual-task experiments provide evidence for the independence of these two memory buffers