

# Memory

## The Multi-Store Model



# tutor2u Full Lesson PowerPoint

## Jenness (1932)

- **Jenness (1932)** was one of the first psychologists to study conformity. His experiment used an **ambiguous situation** involving a glass bottle filled with beans. He asked participants individually to estimate how many beans the bottle contained.
- Jenness then put the group in a room with the bottle, and asked them to provide a group estimate through discussion.
- **Question: What do you think Jenness (1932) found?**
- **Task: Answer questions 1 and 2 on the handout provided.**



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## Full Lesson PowerPoint Key

- **Green = Key Word or Researcher**
- **Blue = Question / Discussion**
- **Purple = Task / Activity**

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# Memory

## Lesson Objectives:

- **Outline** the **Multi-Store Model of Memory (Atkinson & Shiffrin, 1968)**, including the following key features
  - **Coding**
  - **Capacity**
  - **Duration**
- **Outline & evaluate Peterson & Peterson's (1959) research**, investigating the duration of short-term memory



# What Is A 'Model' Of Memory?

- **Question:** What is a 'model' of memory?
- A model of memory is a **representation** of memory. It helps us to understand how our memory work and what our memory might 'look like'.



# Memory

According to Atkinson & Shiffrin, our memory consists of different components and processes, including:

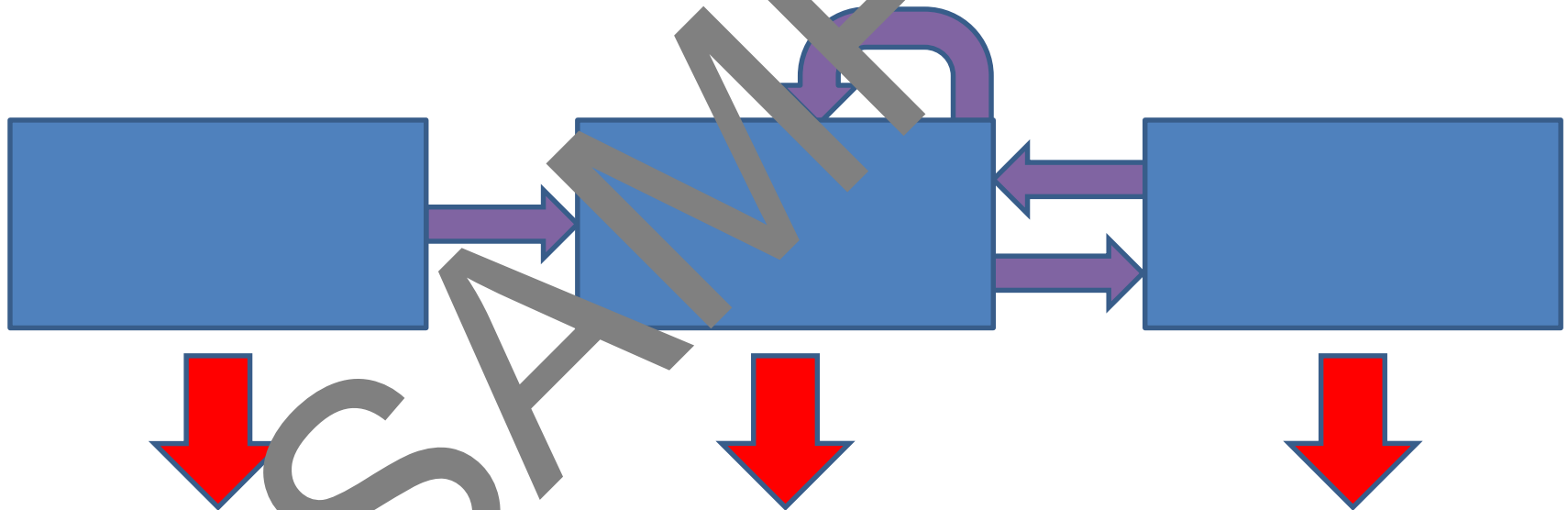
Components	Processes
Short-term memory Long-term memory Sensory register	Retrieval Attention Transfer Rehearsal Forgetting

- **Task:** Using the components and processes listed above, draw a diagram of what you think our memory might look like...



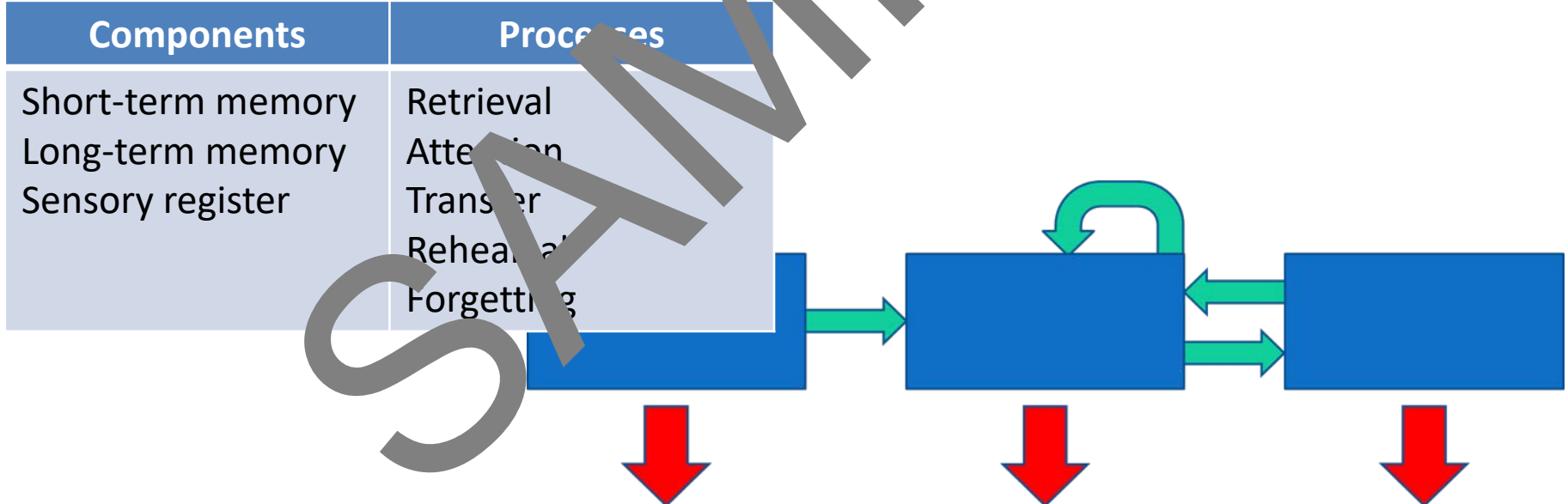
# The Multi-Store Model

- According to Atkinson & Shiffrin, the information we learn passes through a number of stores in order to become part of our long-term memory.



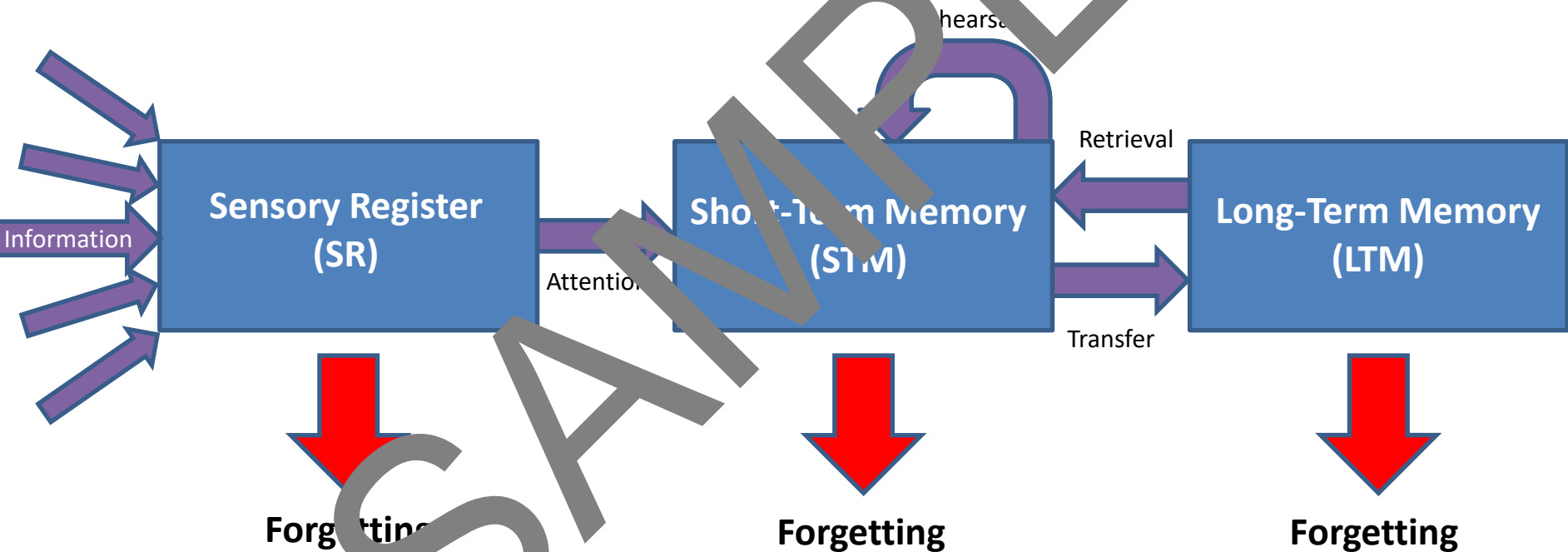
# The Multi-Store Model

- **Task: Take 2** - On a different mini-whiteboard, draw the diagram below and see if you can create Atkinson & Shiffrin's model, using the labels below.
- **Hint:** Each box and each arrow has its own label; however, the three red arrows are the same!



# The Multi-Store Model

- Let's see if you were correct.

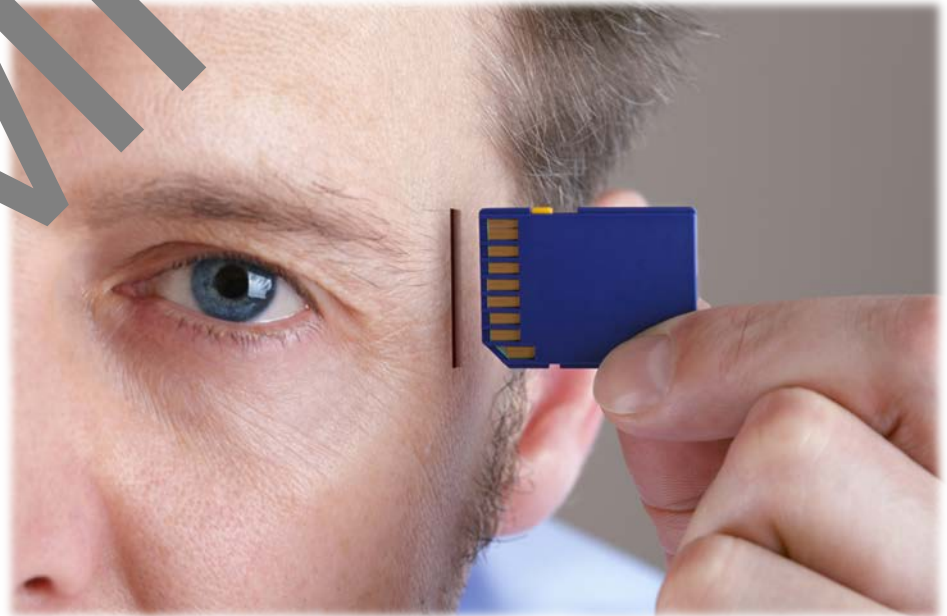




# The Multi-Store Model

According to Atkinson & Shiffrin, each store differs in terms of its coding, capacity and duration.

- **Question** – What do you think we mean by the following?
  - **Capacity**
  - **Duration**
  - **Coding**



# Capacity, Duration and Coding

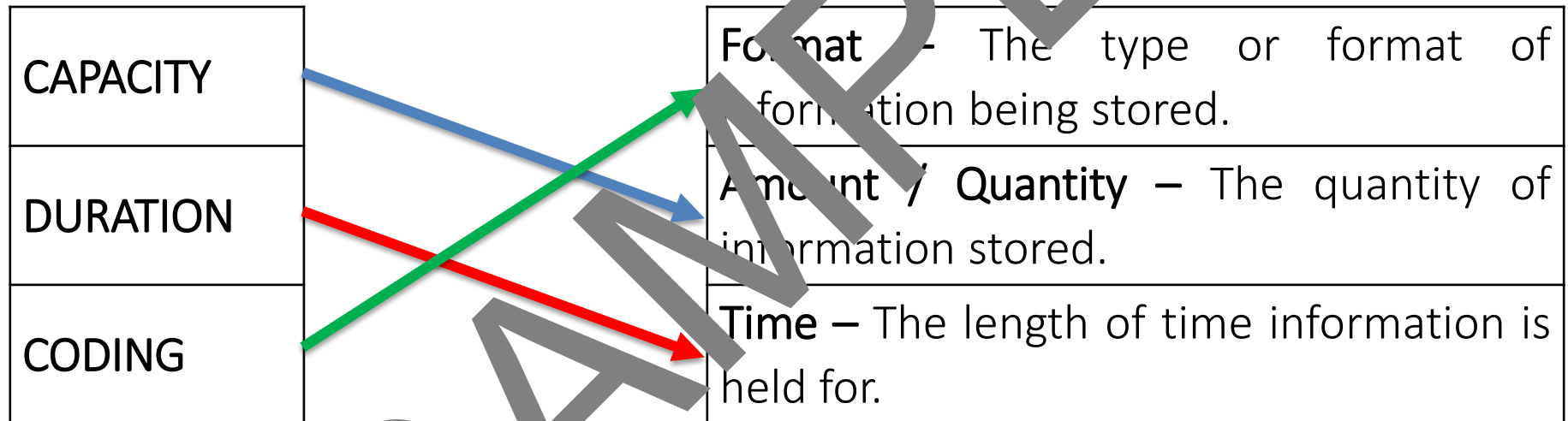
- Task: Match the key terms on the left with the definitions on the right.

Capacity, Duration & Coding

Task: Match the key terms on the left with the definitions on the right.

CAPACITY	<b>Format</b> – The type or format of information being stored.
DURATION	<b>Amount / Quantity</b> – The quantity of information that can be stored.
CODING	<b>Time</b> – The length of time information is held for.

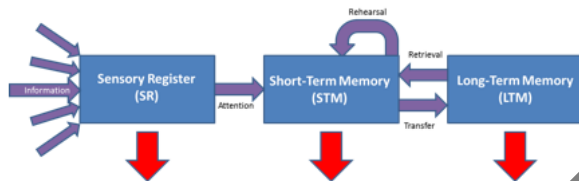
# Capacity, Duration and Coding



# Capacity, Duration and Encoding

- Task: Read the information provided on the multi-store model and summarise the information in relation to the capacity, duration and coding on your multi-store model diagram.

## The Multi-Store Model



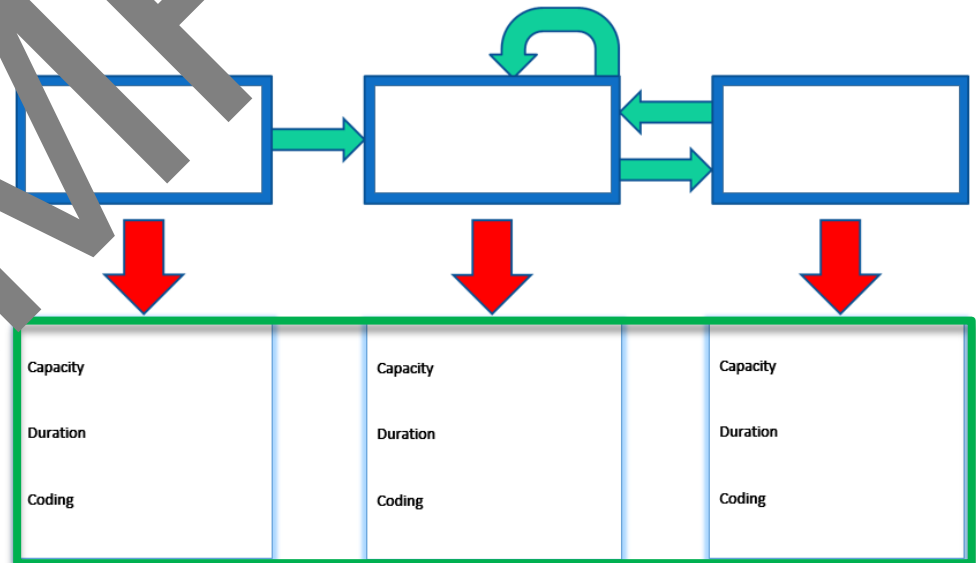
Atkinson & Shiffrin (1968) proposed one of the earliest models of memory – the multi-store model. They suggested that memory is made up of three components: sensory register, short-term memory and long-term memory. According to Atkinson & Shiffrin, memories are formed **sequentially** and information passes from one component to the next, in a **linear** fashion.

Each of the three components has a specific type of coding, capacity and duration. **Coding** refers to the format of information stored. **Duration** refers to the length of time information is held for and **capacity** refers to the amount, or quantity, of information that can be stored.

Information enters the **sensory register(s)** from the environment via our senses. There are separate sensory registers for each of the senses. The two most noted registers include **iconic memory** (where visual information is coded visually) and **echoic memory** (where auditory information is coded acoustically). Most of the information entering the sensory register is lost and the duration is very brief (milliseconds). Only information which is attended to gets passed onto the short-term memory store.

Short-term memory which has a limited capacity of  $7 \pm 2$  'chunks' of information and a limited duration of approximately 18 seconds. Information in short-term memory is coded in an acoustic format. For example, if you are trying to remember a phone number, you might internally repeat the number over and over in your head.

Thereafter, rehearsed information is **transferred** to long-term memory, which has an unlimited capacity and a lifetime duration. Information in long-term memory is coded semantically (by meaning) and can be retrieved from long-term memory to short-term when required.

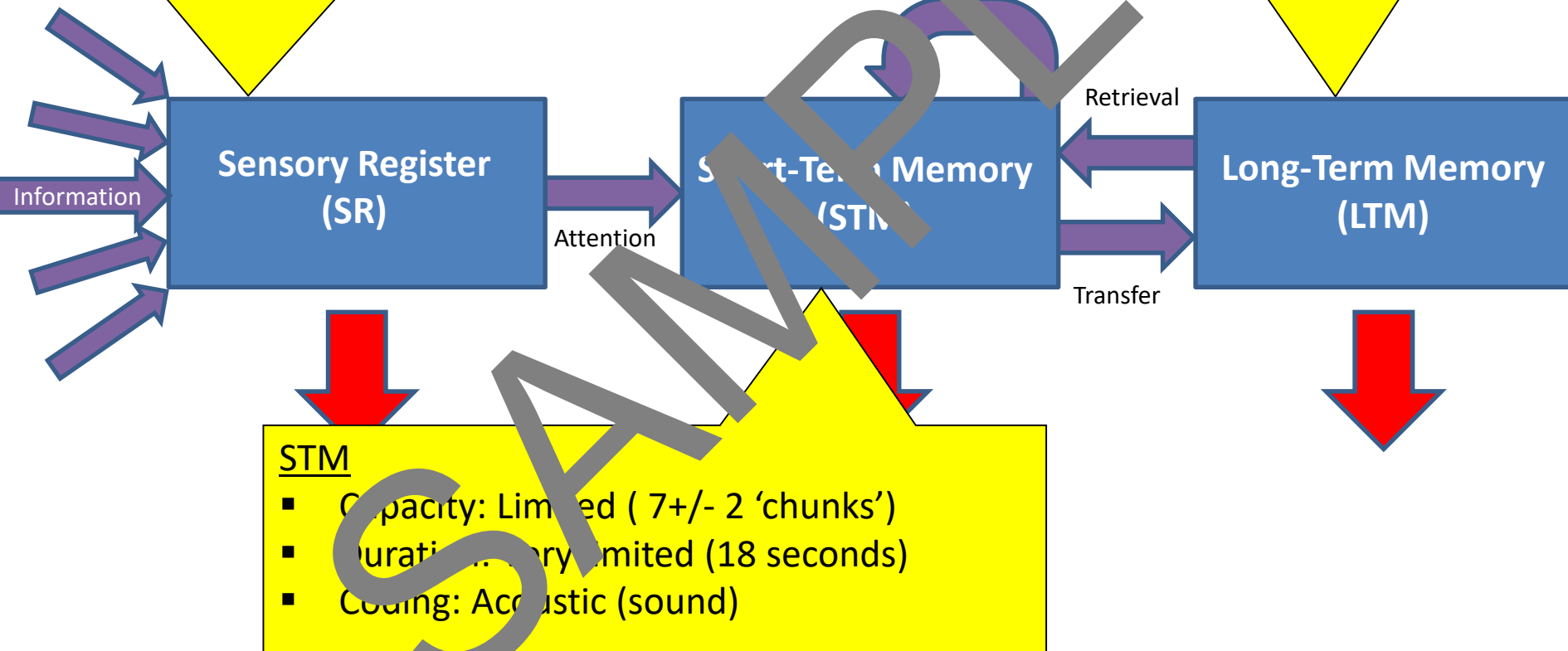


### Sensory Register:

- Capacity: Very large
- Duration: Limited (milliseconds)
- Coding: Sense specific (echoic – acoustic, iconic – visual, etc)

### LTM

- Capacity: Unlimited
- Duration: Lifetime/Years
- Coding: Semantic (meaning)



# To summarise...

	SENSORY MEMORY	SHORT-TERM MEMORY	LONG-TERM MEMORY
CAPACITY			
DURATION			
CODING			

# Research Investigating STM

Peterson & Peterson (1959)



# Example

- Task: You will be presented with a three letter trigram for 3 seconds, for example:
- Your task is to remember the trigram.
- You will then be instructed to count backwards in 3s or 4s, from a particular number (e.g. 47).
- Finally, when prompted, you will try to recall the trigram and write down your answer.

*\*The PowerPoint has been standardised' so you do not need to click to progress.*



# Peterson & Peterson (1959)

## Peterson & Peterson (1959)

Task: You will be presented with a three letter trigram, for example SCT, followed by a counting task. When instructed, write down the three letter trigram in the table below.

	Trigram	Correct Answer
1		
2		
3		
4		
5		
6		
7		
8		

Write your answers in the space provided on your handout.

**Are you  
ready?**

SAMPLE  
CXT

# Distractor Task

---

OUT LOUD: Starting from 47 count  
backwards in 3's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE  
XVT

# Distractor Task

---

OUT LOUD: Starting from 57 count  
backwards in 4's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE

NZU



# Distractor Task

---

OUT LOUD: Starting from 101 count  
backwards in 3's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE

XST

# Distractor Task

---

OUT LOUD: Starting from 27 count  
backwards in 4's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE

KG

# Distractor Task

---

OUT LOUD: Starting from 157 count  
backwards in 3's.

# Recall

---

Now write down the trigram.

SAMPLE



SAMPLE  
PLB

# Distractor Task

---

OUT LOUD: Starting from 140 count  
backwards in 3's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE

CH

# Distractor Task

---

OUT LOUD: Starting from 100 count  
backwards in 4's.

# Recall

---

Now write down the trigram.

SAMPLE

SAMPLE

NIKU

# Distractor Task

---

OUT LOUD: Starting from 63 count  
backwards in 3's.



# Recall

---

Now write down the trigram.

SAMPLE

# Peterson & Peterson (1959)

- Task: On your table calculate the total number of people who got each trigram correct. The answers were as follows:

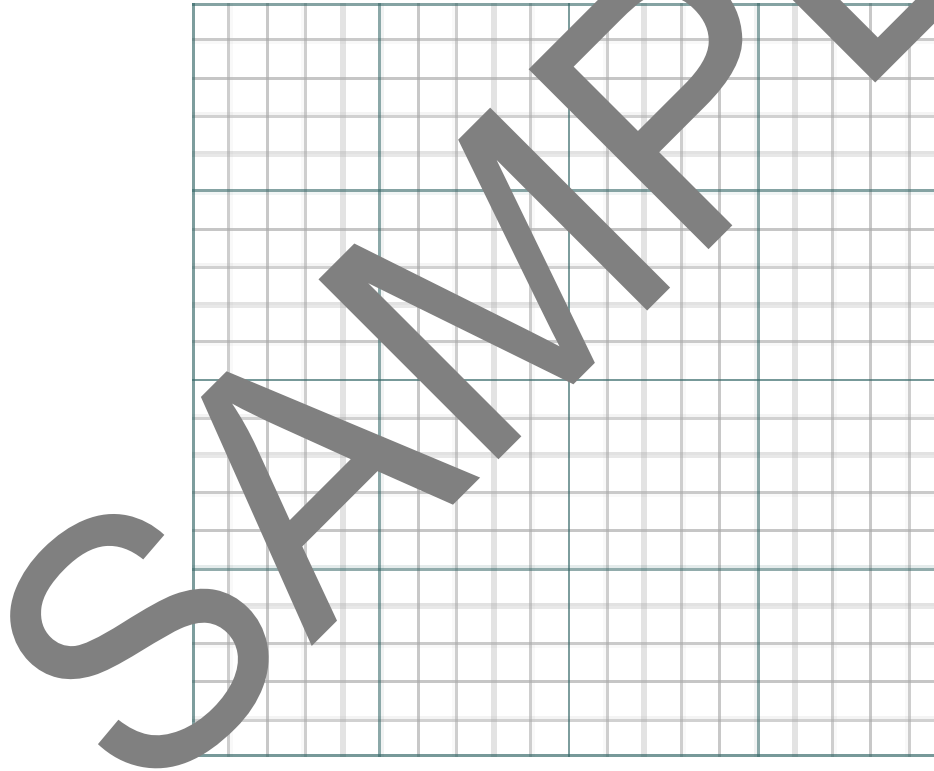
1	2	3	4	5	6	7	8
CXT	XYT	NZU	XST	NG	PLB	CXH	NKU

# The Results

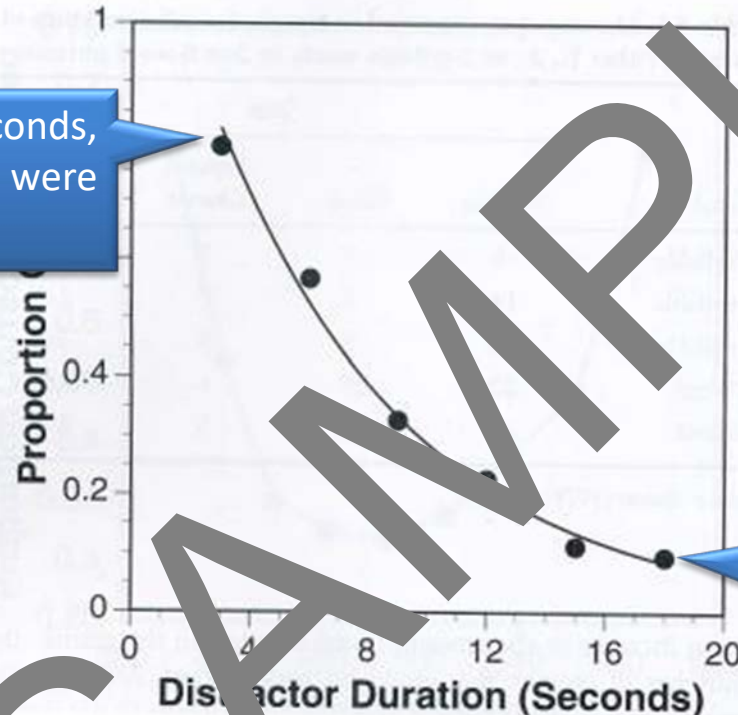
	CXT	XYT	NZU	XST	YIG	PLB	CXH	NKU
	4 sec	6 sec	8 sec	10 sec	12 sec	14 sec	16 sec	18 sec
Table 1								
Table 2								
Table 3								
Table 4								
Total (Correct)								

# Scattergram

- Task: Draw a scattergram from our replication of Peterson & Peterson's study. Imagine that it is worth 4 marks.



# Peterson & Peterson (1959)



After only 3 seconds, 80% of the trigrams were recalled correctly.

Recall got progressively worse as the delay grew longer!

After 18 seconds, fewer than 10% of the trigrams were recalled correctly.

Task: 1) Summarise the results from the study. 2) What can we conclude about the duration of our STM?

# Peterson & Peterson (1959)

- Task: On the next slide you will be shown a summary of the Peterson & Peterson (1959) study. Your job is to summarise the Peterson & Peterson study in exactly 60 word. No more, no less. EXACTLY 60 words. It must contain the aim, method, results and conclusion

[illegible]

Peterson & Peterson (1959) investigated the duration of short-term memory by conducting a laboratory experiment with a sample of 24 psychology students.

The students had to recall meaningless three-letter trigrams (for example, THG, XWV) at different intervals (3, 6, 9, 12, 15 or 18 seconds). To prevent rehearsal the students had to count backwards in threes or fours from a specific number, until they were asked to recall the letters.

Peterson & Peterson found that the longer the interval, the less accurate the recall. At 3 seconds, around 80% of the trigrams were correctly recalled, whereas at 18 seconds only 10% were correctly recalled.

Peterson & Peterson concluded that short-term memory has a limited duration of approximately 18 seconds. Furthermore, the results show that if we are unable to rehearse information, it will not be passed to long-term memory, providing further support for the multi-store model and the idea of discrete memory stores.

# Give Me 60!

Peterson & Peterson (1959) examined the effect of duration on Short-Term Memory (STM). 24 Psychology students were shown 3 letter words, followed by a distractor task of 3-18 seconds. They then tried to recall the words. After 3 seconds, 80% of the words were recalled, whereas 10% were recalled at 18 seconds. This shows that duration has an effect on STM.

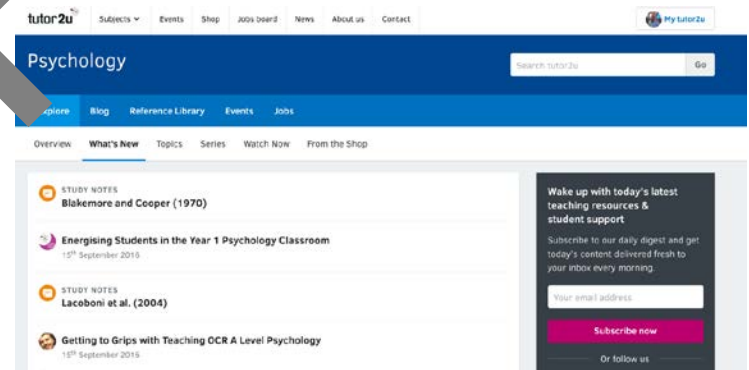


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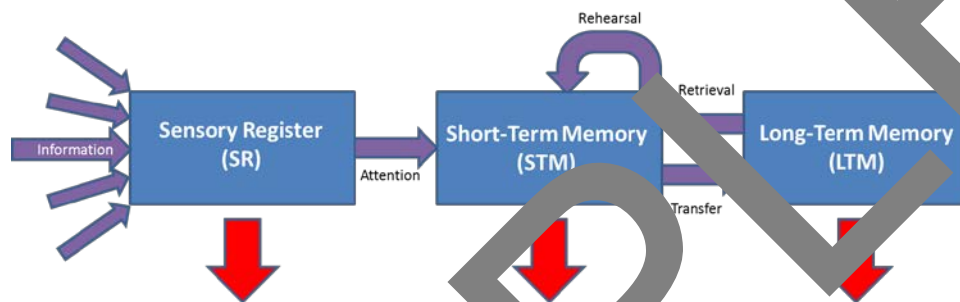
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CAPACITY
DURATION
CODING

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Short-term memory has a limited capacity of  $7 \pm 2$  'chunks' of information and a limited duration of approximately 18 seconds. Information in our short-term memory is coded in an acoustic format. For example, if you were trying to remember a phone number, you might internally repeat the number over and over in your head.

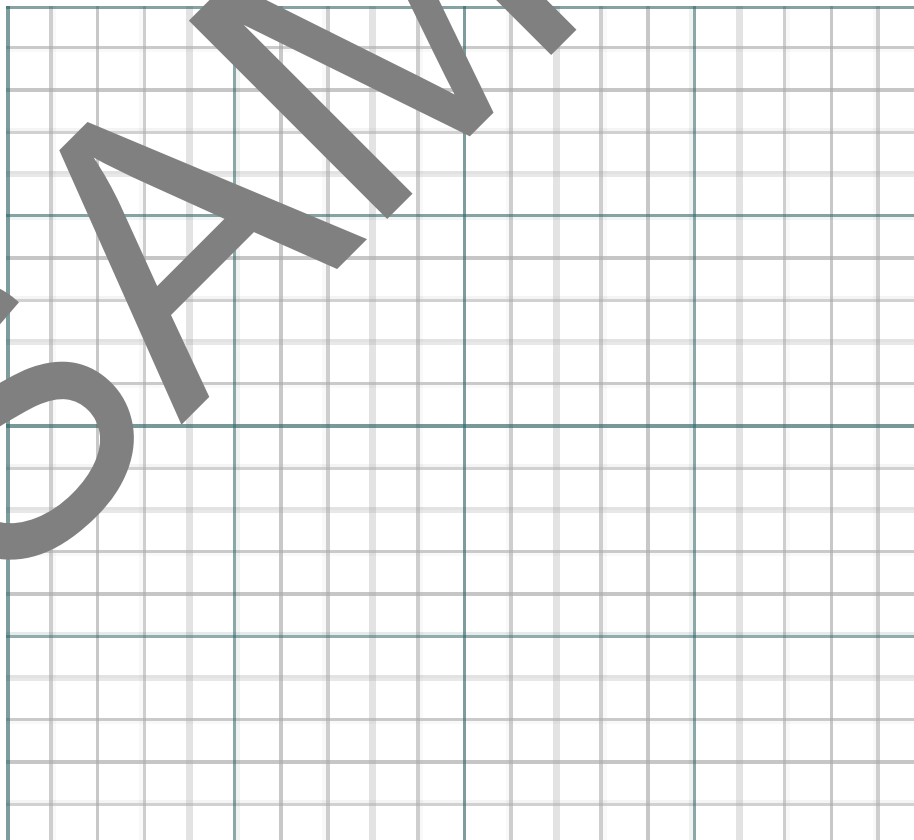
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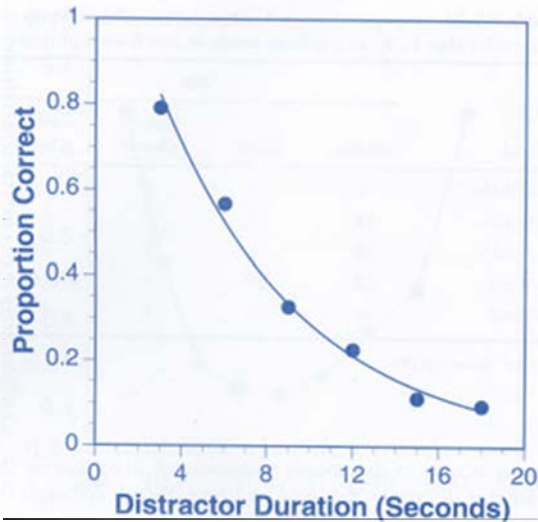
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Task: After recording the results as a class draw a scatter plot. Imagine that it is worth 4 marks.





Task: 1) Summarise the results from the study.  
2) What can we conclude about the duration of our STM?

### Summarising Peterson & Peterson (1959)

Task: On the board you will be shown a summary of the Peterson & Peterson (1959) study. Your job is to summarise the Peterson & Peterson study in exactly 60 words. No more, no less: EXACTLY 60 words. It must contain the study method, results and conclusion.

# The Multi-Store Model – Atkinson & Shiffrin (1968)

