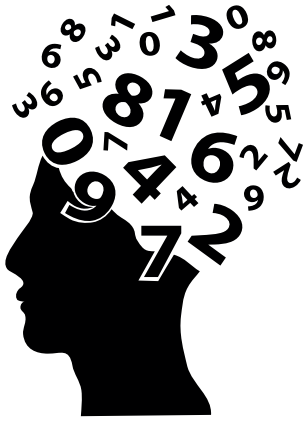
Research on coding, capacity and duration



Task

Copy the following phrases into the appropriate column below. Note that there are four items in each column

- Researched coding in STM.
- Researched capacity of STM.
- Researched duration of STM.
- Found that words were coded acoustically in STM.
- Used consonant syllables such as BNT in their research.
- Used the term 'the magical number 7' to describe capacity of STM.
- Found that information was coded semantically in LTM.
- Used counting backwards as a means of preventing rehearsal.
- Investigated chunking in STM.
- Used word lists such as cat, mat, hat, chat in research on memory.
- Did some research similar to that of Jacobs (1887).
- Found that STM lasts about 18 secs.

Miller (1956)	Baddeley (1966)	Peterson & Peterson (1956)

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Complete the table: MSM stores

2.3

	Sensory register	Short-term memory STM	Long-term memory LTM
			
			
			

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Practical: serial position curve (sheet 1)

Explanation

You have learned about short- and long-term memory. This practical aims to demonstrate the effects of these two types of memory.

Aim

To investigate whether the position of a word in a list affects the likelihood of its recall.

Instructions

1. First you need to think about the ethical considerations. Note down which issues are relevant and how you will deal with them.

Ethical issue	Dealt with by

2. Next you need to generate a list of 20 words. The words you select should all be equivalent – they should all be equally likely to be forgotten/remembered. Think about what sort of words are best. Once you have decided on the list – record someone reading them out aloud.
3. Check the recording for consistency in clarity, equal emphasis on the words and equal time gaps between them.
4. You need to write a **consent form** – this must include details of both the ethical and procedural requirements (what will be required of them, e.g. time, tasks etc.).
5. You need to write some **standardised instructions** so that each participant is doing exactly the same task.
6. Next you need to perform a **pilot study** – find three students to try the procedure out on – their data must be discarded. Make any changes necessary to the word list and procedure and consent form.
7. Carry out the study on a suitable number of participants, ensuring that they can work without interruption.
8. Transfer the scores to the **Master data sheet** and then present the data on a suitable chart with word position (in the list) along the x-axis (horizontal) and number of participants who recalled it on the y-axis (vertical axis).
9. Use a **research poster template** or make your own to produce a research poster that summarises your findings, etc.

Extension : Fill in the **Reflection sheet** to check what you have learned by doing this practical.

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Practical: serial position curve (sheet 2)

Master data sheet

Position in the list	Word																							
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								

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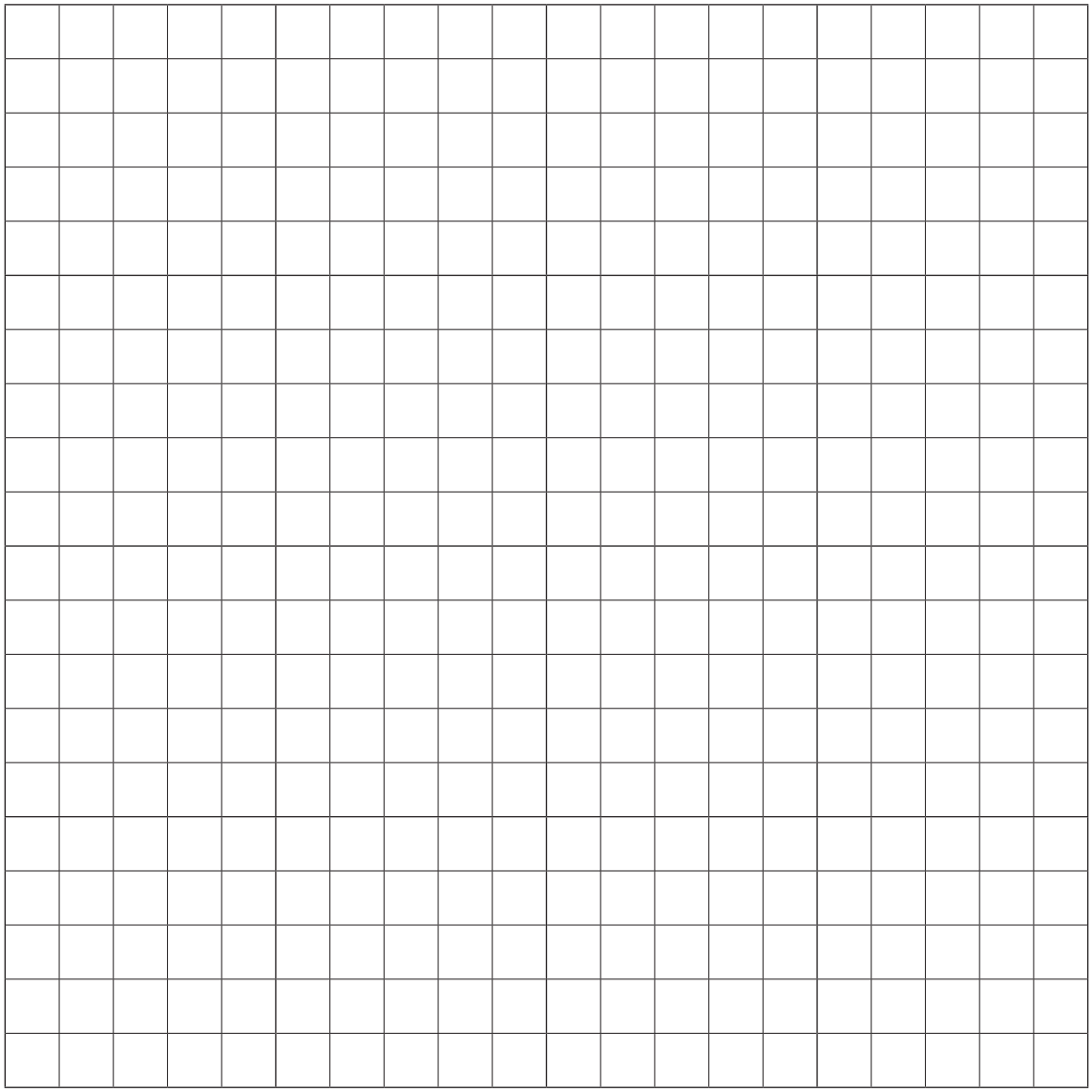
Practical: serial position curve (sheet 3)

2.4c

TITLE OF GRAPH :

Please label the axes.



Explain what this data shows:

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Practical: serial position curve (sheet 4)

2.4d

Explanation:

Having completed this practical you should now think about what it tells us about memory and what you have learned about research methods.

Reflection sheet

1. **Why was it important to write standardised instructions?**

2. **Why was it valuable to carry out a pilot study? What did you discover?**

3. **What might this data tell us about memory?**

4. **What does this model tell us in terms of the MSM?**

5. **What are the strengths of this study?**

6. **What are the limitations of this study?**

7. **Any other comments?**

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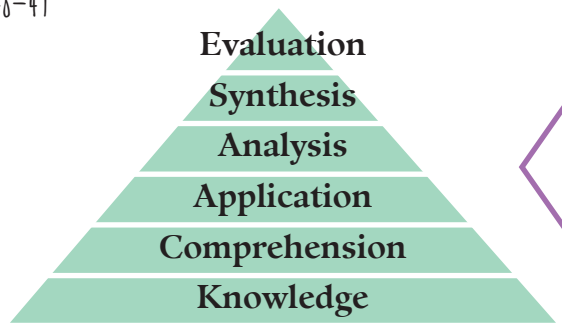
Blooming the MSM!

2.5



Bloom's taxonomy sets out the steps towards higher order thinking in education. Using questions based on each level of the taxonomy can help you gain a deeper understanding of some of the challenging concepts that you meet.

The following questions are designed to take you from the basic level of understanding and encourage you to reach the highest level that you can.

1. **Knowledge** – What are the components of the multi-store model of memory?

2. **Comprehension** – How do the different stores work together to facilitate long-term storage of memories?

3. **Application** – How does the MSM explain that if we are given 20 words for immediate recall, we tend to remember the first few and the last few.

4. **Analysis** – Contrast what happens in the STM and LTM.

5. **Synthesis** – Can you see a possible solution to the fact that sometimes we do not remember everything we try to even when we rehearse it?

6. **Evaluation** – Summarise your own judgement of the MSM – how well does it explain how memories are formed?

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WHAT TYPE OF LTM IS THIS?

There are three types of long-term memory (LTM). Write out the definition of each in the table below then put each of these memories into the appropriate column.

Your friend's wedding.

How to juggle.

Where the Eiffel Tower is.

Your first day at school.

Your first date.

How to ride a bike.

Who won the women's Wimbledon final in 2014.

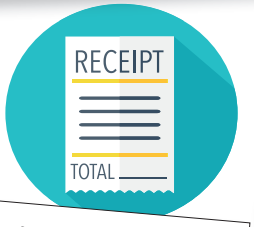
The purpose of this.

What I watched on TV last night.

Your address.

The words of a song.

How to book a restaurant table.



How to check a bill.

How to use your phone to work out the bill.

The row you had with your friend last week.

How to make a cake.

Episodic memory	Procedural memory	Semantic memory
Definition	Definition	Definition

Clinical case studies of amnesia

Clive Wearing is mentioned in the SDB as a man who suffered severe memory loss after a brain infection. Sadly there are many cases of amnesia caused by brain damage. Two more brief examples are given here.

Four years ago an artery burst in Marilyn Motyer's head resulting in significant loss of both her long-term and short-term memory. She was 42, with a husband and three children and had led a busy life as a teacher and academic. When she came round in hospital, her own childhood and that of her children had disappeared. Her past has had to be reconstructed for her by friends and photographs but she herself remembers none of it.

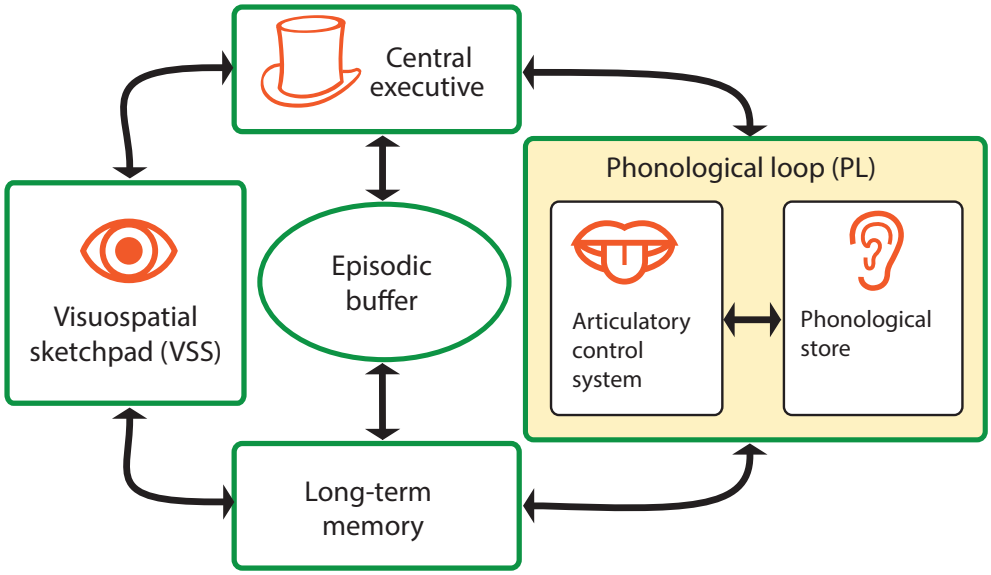
Scott Bolzan, who ran a successful business, slipped on the floor of his office and suffered profound retrograde amnesia. In essence, 46 years of his life disappeared. His short-term memory is reasonably intact but he doesn't recognise his wife of 25 years or any family members, is unaware that he was a professional footballer, a pilot or that he ran a very successful business.

1. What are the three types of LTM suggested by Tulving?
2. Which type of LTM has mainly been affected in the case of Marilyn and Scott?
3. What do these case studies indicate about how memories are stored in the brain?
4. Case studies of this type provide mainly qualitative data. What is qualitative data?
5. Give **one** strength of using qualitative data to understand behaviour. Relate your answer to the cases above.
6. Other studies of memory gather quantitative data. What is quantitative data?
7. Give **one** strength and **one** limitation of using quantitative data.
8. In studying amnesia, these case studies are often the only method available to psychologists but findings need to be treated with caution. What is the main limitation of using clinical cases of brain damage to study memory?

THE FOUR COMPONENTS OF THE WORKING MEMORY MODEL

2.10

Task: The specification requires you to know the capacity and coding of each element of the working memory model. You also need to know the function of each part.



Complete the table below (and when correctly completed, use as a revision guide).

Component	Main purpose	Capacity	Coding
Central executive			
Phonological loop (inner voice)			
Visuospatial sketchpad (inner eye)			
Episodic buffer			

The working memory in action

2.11

According to the working memory model (WMM), short-term memory is an active store used to hold information which is being manipulated. Logie (1999) refers to it as the '**desktop of the brain**'- it holds material in our conscious mind long enough for us to manipulate it and use it to make a decision or execute a task. Read the following everyday incident and answer the questions with reference to this model of memory.

It's the beginning of January and you are at the sales. You walk into a shop and head for the bargain rail. On sorting through it, you see a pair of trousers and a jumper you like. While looking at them, you are making various mental calculations. Can you afford either or both of them (this may involve thinking about what money you have in your bank account or in cash, or when you will next get some money and so on). You will also consider what the clothes will look like 'on', how easily they will clean or crease, what other clothes you've got to wear them with, how often you will wear them and so on (you can probably think of lots of other such considerations). All of the decisions made before you actually come to a decision to try on, buy, come back later, ask for a second opinion or not to buy the clothes at all!

This is a simple example but it serves to illustrate how many things go through your mind when making an everyday decision.

1. From the account provided, give **two** examples of tasks being carried out by the visuospatial sketchpad. (2 marks)

2. Within this scenario, suggest **one** more task (not mentioned in the script) that the visuospatial sketchpad could be doing. (1 mark)

3. From the account provided, give **two** examples of tasks being carried out by the articulatory loop. (2 marks)

4. Within this scenario, suggest **one** more task (not mentioned in the script) that the articulatory loop could be doing. (1 mark)

5. Give **two** examples of information, from other sources (e.g. LTM or perception) being used by the central executive to help decide whether or not to buy the clothes. (2 marks)

Proactive or retroactive interference?

2.12

Reminder!

Proactive interference involves old information interfering with new information.

Retroactive interference involves new information interfering with old information.

Decide whether the following instances of interference are proactive or retroactive.

Marie changes her email address after getting a lot of spam. Six months later her friend asks her what her old email address was but she has forgotten.

Proactive? *or* Retroactive?

Lucy learns French at primary school then learns Spanish as well as French at secondary school. When her Spanish teacher asks her what the Spanish for 'dog' she gives the French name 'chien'.

Proactive? *or* Retroactive?

Jim has played doubles tennis for years but when his friend stops playing, he decides to start playing singles matches. At first he keeps the ball within the 'singles' part of the court but after a few matches, he keeps hitting the ball into the tramlines, forgetting that this is not permitted in a singles match.

Proactive? *or* Retroactive?

After being dumped by his girlfriend Julie, Jonathan starts going out with a girl called Judy. When describing her to a friend, he refers to her as Julie.

Proactive? *or* Retroactive?

Elsie gets a new bank card and memorises the PIN. When she wants to use her old card, she finds she has forgotten the PIN for that one.

Proactive? *or* Retroactive?

Ben lived at 112 Dunster Road for 5 years, moved to 10 Lambert Street and then, rather homesick, moved to 145 Dunster Road. After being there a year, he's asked for his address and says '112 Dunster Road' before realising his mistake.

Proactive? *or* Retroactive?

Joy takes a bike ride in Amsterdam and learns that, to stop the bike, you need to pedal backwards. She finds this very difficult to do as she automatically pulls on the handlebars whenever she wants to brake even though there is no brake handle there.

Proactive? *or* Retroactive?

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A practical based on a newspaper article - sheet 1

2.13a

Your task

You are going to conduct a practical into interference theory of forgetting. The basic idea is that you select a newspaper item, change some key details and then see if the 'new' version interferes with people remembering the original version.

Preparation work

Step 1: Find a newspaper article (something like a crime report) that contains some factual information, for example a description of a person by age, hair colour, height. The article needs to contain about eight pieces of factual information. Do your best to find something interesting!

Print out the original article, then devise an alternative version by altering a certain number of the items (make about eight changes). So, for example, if a man was described as being 5ft 10 inches, you could change that to 6ft.

Step 2: Compile a questionnaire about the key facts (e.g. what height was the man who shouted at the female driver?). The correct answers are those that refer to the ***original*** article.

You will use two separate groups of participants. One group (the control) only hears the original article and the other group (the experimental group) hears them both with the original article read ***after*** the first one.

You will measure interference by using the questionnaire and comparing the number of correct answers from the control group with the number from the experimental group. When you conduct the experiment, make sure that the experimental group know that they are answering questions based on the second article (the one they have just heard).

Step 3: Design your procedures. You need to consider certain controls, for example using the same time lapse between the story and the questionnaire, standardising the way the articles are read – e.g. by using a recording of a person reading it.

You must also pay attention to ethics. Ensure you have a handout on ethics - your teacher will provide this. Ensure that you follow it fully when designing your procedures.

Step 4: Before carrying out the study you need to write:

A brief to read to the group, explaining to the participants what you intend to do and thanking them. Reassure them that the questionnaires are **anonymous** and write that in bold on the questionnaire itself.

A debrief, giving full details of the study.

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A practical based on a newspaper article – sheet 2

Aim of the experiment (be precise not vague: mention what you are investigating and how it will be measured).

The variables
The independent variable (IV) and how it was operationalised.

The dependent variable (DV) and how it was operationalised.

The participants
How did you choose your participants? What is this method of sampling called?

What was your **experimental design?** (Independent groups, repeated measures or matched pairs?)
Why did you select this design?

You should use **standardised instructions**. Write them out.
(What you are going to say to the participants at the start of the study and during it.)

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A practical based on a newspaper article – sheet 3

Your results

Your results can be presented in several ways. This will depend to some extent on the data you collected.

Summary table

Draw a summary table showing descriptive statistics: one appropriate measure of central tendency and one measure of dispersion. Below this table write *at least* one sentence describing what the data in the table is showing.

Graph

Hand draw a graph of results. This could take the form of:

- A bar chart giving the mean number of correct scores in each condition. Make sure the axes are labelled correctly.
- If appropriate, a pair of pie-charts giving the percentage of correct responses in each of the two conditions.

Conclusion

What can you suggest from these results?

Extension activity

Consider the good and bad points of your research design and what you might have changed.

1. The sample – would you get the same results with a different sample? Explain why.
2. Controls – are there other things that should have been controlled? What effect might this have had?
3. The way used to measure memory – you used a real-life reported incident but did participants behave like they would have in everyday life?
4. Standardised instructions – did you give the same information to all participants or did you have to add further information?
5. The attention paid to ethics – were participants in any way affected by taking part in the study?
6. The application of results – are there problems with generalising from these results?
7. Are there any other improvements that could be made?

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Godden and Baddeley 1975

Context-dependent forgetting

The classic study by Godden and Baddeley is described in your textbook. They tested divers on word recall when conditions between learning and recall were different or the same. The table below shows the actual number of words recalled from a list of 36 in each of the four conditions.

		Recall environment	
		DRY	WET
Study environment	DRY	13.5	8.6
	WET	8.5	11.4

1. Calculate the mean scores for the two main conditions (to 2 decimal places). The two conditions are when learning and recall are the same and when learning and recall are different. (2 marks)
2. Draw a bar chart of the raw scores for all four conditions. Remember to label the axes. (4 marks)
3. What do these results tell us about context-dependent forgetting? (1 mark)
4. What type of experimental design does this use? (1 mark)
5. This is a field experiment. Give **one** advantage and **one** disadvantage of such an experiment. (4 marks)
6. A similar study was conducted in which the scores (out of 20) for the two conditions are as follows:

   Same: 12, 16, 13, 18, 13, 13, 17, 19, 12, 14
   Different: 9, 12, 13, 9, 10, 9, 9, 15, 13, 8, 10

   a. Calculate the mean score for each condition (to one decimal place). (2 marks)
   b. What is the modal score for each condition? (2 marks)
   c. What is the median score for each condition? (2 marks)

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Context-dependent, state-dependent or meaningful link

2.15

One of the reasons why we forget is that we do not have the correct cues in order to retrieve information. Some of these cues are linked to the information in a meaningful way. Others just happen to have been present at the time of encoding: these include context-dependent cues and state-dependent cues.

Task: Place the following phrases into the correct column depending on whether they are associated with cues that are context-dependent, state-dependent or provide a meaningful link.

* External cues
* The room in which the incident occurred
* Mnemonic techniques
* Carter and Cassidy (1998)
* Peter was happy when it happened
* Tulving & Pearlstone (1966)
* Godden and Baddeley (1975)
* Aggelton and Waskett (1999)
* Internal cues.
* The use of categories to help recall information
* Mood dependent forgetting
* Baker *et al.* (2004)
* Susie was drunk when she heard the story.
* Richard of York Gave Battle in Vain
* The cue 'LTM' helps you remember characteristics of your long-term memory.

MEANINGFUL LINK	CONTEXT-DEPENDENT	STATE-DEPENDENT

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Spot the leading questions!

2.16

Task: For each of the following:

a) Identify whether or not each is a leading question.

b) Turn the leading questions into non-leading questions or vice versa.

1. *Did you see the broken glass?*

2. *How drunk was the perpetrator?*

3. *Did you see the woman hit the dog?*

4. *Was there any discussion between the two people?*

5. *The perpetrator was taller than the victim wasn't he?*

6. *What colour was the traffic light as the van came through?*

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Post-event discussion: The effect of witness testimony

Review: Using your notes or textbook, remind yourself of what is meant by post-event discussion. Define it in your own words here:

SCENARIO

Caroline and Martha witnessed an attack on their friend Bob and are to be interviewed by police on the following day. They have been told by the police that they must not discuss the case before giving testimony. They are annoyed and want to be able to comfort each other and discuss it. You were talking to them about what you had been learning about eyewitness testimony in psychology lessons so they ask you why they cannot discuss the details with each other.

Task: One of the extension features linked to this spread outlines two explanations of the impact of post-event information on eyewitness testimony. Read these and use them to explain to the girls why they should not, in this case, discuss the situation before they record their testimony.

Well . . . according to ***Source Monitoring Theory*** you should not discuss it because . . .

Well . . . according to ***Conformity Theory*** you should not discuss it because . . .

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Research studies on EWT and anxiety

In your textbook there are four research studies of the effect of anxiety on witness testimony.

Complete the table below concerning these studies.

	Johnson and Scott (1976)	**Yuille and Cutshall (1986)**	**Parker *et al.* (2006)**	**Valentine and Mesout (2009)**
				
Briefly outline the procedure of the study.				
Was the external (ecological) validity high, low or medium? Explain why.				
Outline the main findings.				
Positive points				
Negative points				

Extension activity

Suggest one positive and one negative evaluation point for each study, other than external validity.

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Explanations for the relationship between EWT and anxiety

Research shows a puzzling relationship between anxiety and the accuracy of EWT – some studies suggest that high anxiety lowers our ability to observe accurately whilst other studies indicate that high levels of stress increase this ability.

TASK: Define each of the following terms and describe how they help explain the findings.

WEAPON FOCUS

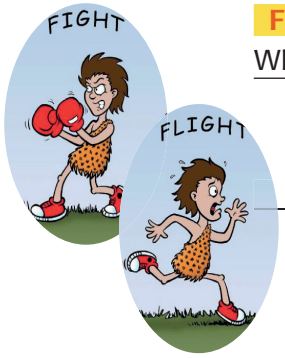
What is it?

How does it explain the relationship between EWT and anxiety?

THE TUNNEL THEORY OF MEMORY

What is it?

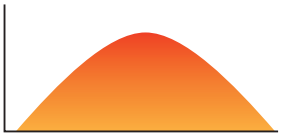
How does it explain the relationship between EWT and anxiety?



FIGHT OR FLIGHT RESPONSE

What is it?

How does it explain the relationship between EWT and anxiety?



THE YERKES –DODSON LAW

What is it?

How does it explain the relationship between EWT and anxiety?

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Presentation on the cognitive interview

2.20

what is it? what's the point? what's the evidence?

As a group, you have been asked by the local police to give a presentation on the cognitive interview so they can made an informed choice about whether to use it. Your presentations will be using PowerPoint.

To do this, you are going to split into three groups, each presenting a different aspect in the following order:

What is a cognitive interview (CI) and how is it conducted?

- Go through the basic procedure of the CI including the enhanced CI.

What psychological principles underpin the use of the CI?

- Cover factors such the encoding specificity hypothesis and the absence of leading questions.

The evidence for and against the use of the CI

- Cover practical issues and research evidence for and against. This could take the part of a general summing up of the pros and cons of using a CI as opposed to a standard interview.

P.S. the whole class needs to work as a team to ensure there is no overlap in your presentations.

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Why is the cognitive interview effective?

The cognitive interview is a means of obtaining maximum information from a witness while minimising the interviewer's influence on his or her responses. One way of evaluating the cognitive interview in an exam is to explain its effectiveness in terms of other concepts with the study of memory. We can use **retrieval failure of forgetting** and **leading questions** in order to do this. In the boxes below, describe how these concepts help to explain the effectiveness of the cognitive interview (CI).

Retrieval failure theory of forgetting: Using this theory, briefly explain why the CI helps to obtain the maximum amount of recall possible.

The influence of leading questions: With reference to leading questions, discuss why the CI is more likely to provide accurate recall from witnesses than the standard interview.

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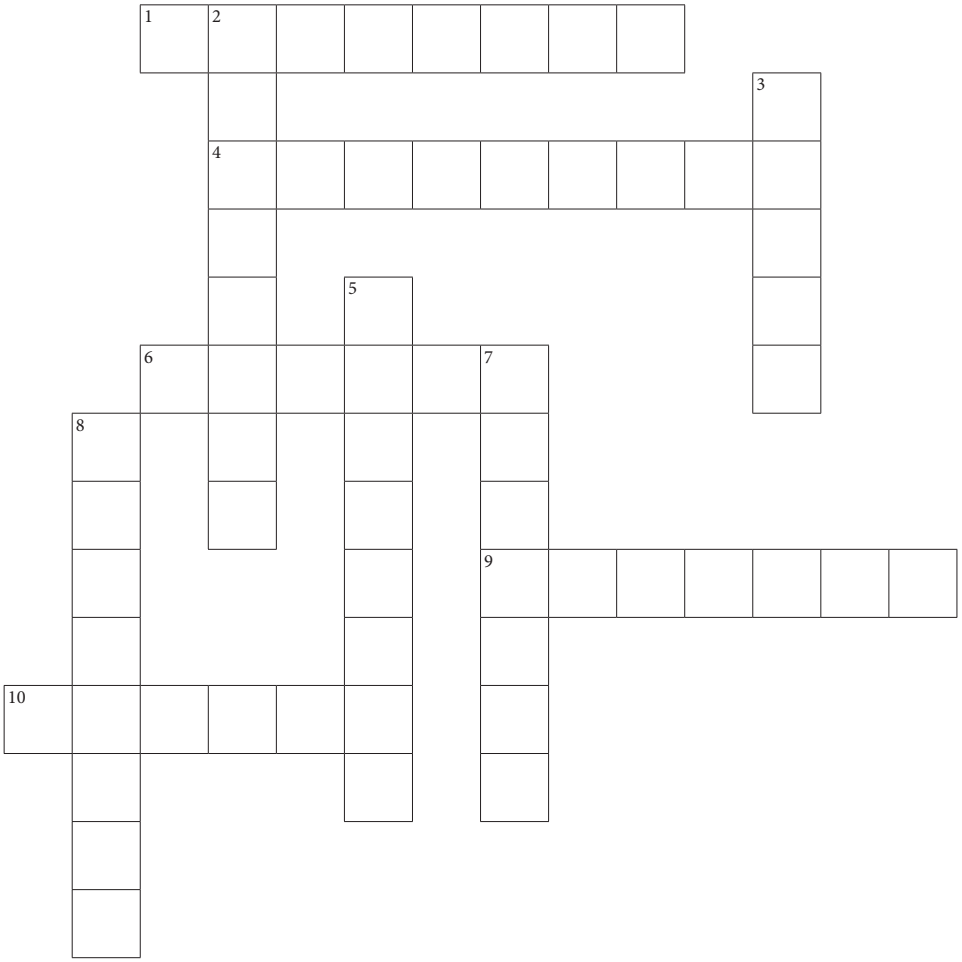
Crossword

2.22



Across

1. The coding of STM.
4. The type of interference in which past memories interfere with new ones.
6. The occupation of the participants in Godden and Baddeley (1975) study.
9. The term used to describe loss of memory.
10. Researcher central in investigation of inaccuracy of EWT.

Down

2. The amount of information that can be held in a memory store.
3. Miller's magic number plus or minus 2.
5. The means by which information is transferred from STM to LTM, maintenance _____.
7. The main means of coding used in LTM.
8. Type of LTM that recalls events.

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