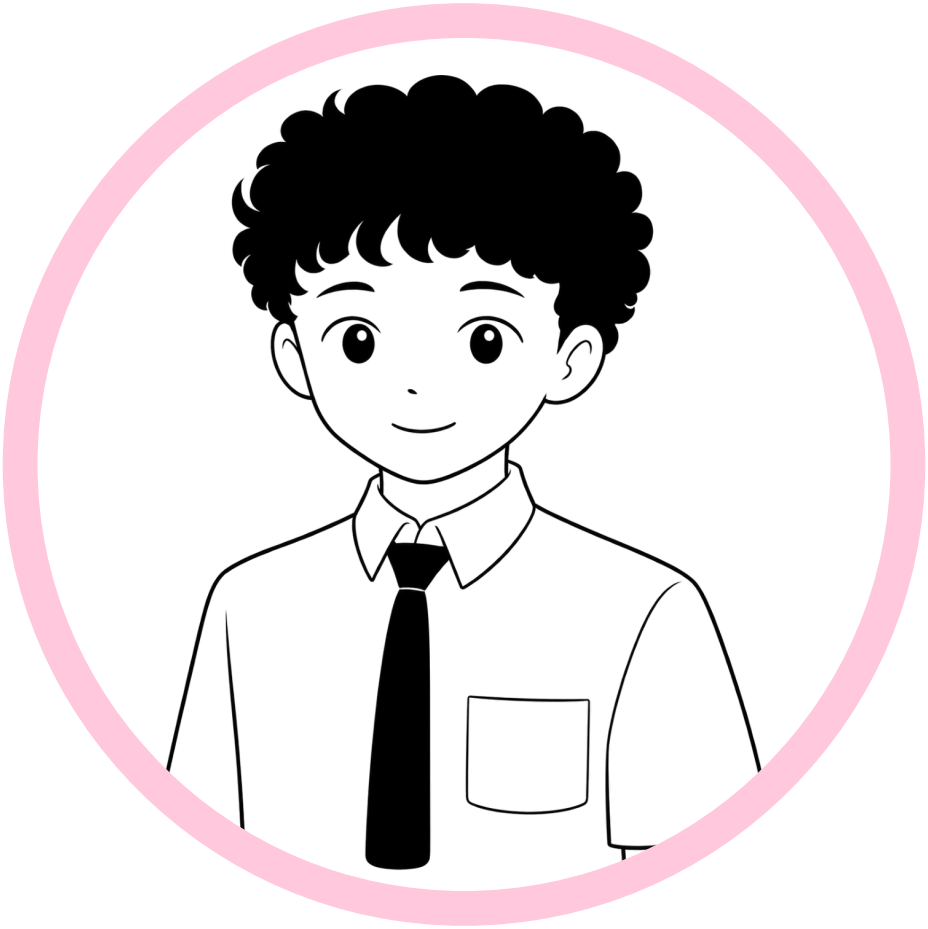
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



MARK SCHEME

3.1.2 THE WORKING MEMORY MODEL

SCORE	PERCENTAGE
/134	%

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Q1.

[AO1 = 3]

3 marks for a clear and coherent description of the phonological loop.

2 marks for a less detailed description of the phonological loop.

1 mark for a muddled or limited description.

Possible content:

- one of the slave systems controlled by the central executive
- deals with auditory / sound information or deals with both written and spoken material
- can be subdivided into the phonological store (inner ear) and the articulatory process (inner voice)
- the phonological store stores the words you hear (in speech form)
- the articulatory process allows for maintenance rehearsal
- has a limited capacity / the capacity of the loop is what can be said in 2 seconds.

Credit other valid points.

[3]

Q2.

[AO3 = 1]

1 mark for a brief suggestion of why the WMM offers a better explanation.

Possible content:

- it is not a unitary store
- range of research support, e.g. dual task studies, brain scanning studies
- the WMM explains STM as a more active process than the MSM.

Credit other valid points.

[1]

Q3.

(a) **[AO2 = 2]**

1 mark for each:

Mentally counting backwards from 100 – Articulatory loop or store; phonological loop or store; articulatory control processes.

Tracking coloured shapes on a computer screen – Visuo-spatial scratchpad / sketchpad / Inner scribe / Visual cache.

Accept central executive / episodic buffer for either component, but not the same answer for both.

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If more than one component is named for either task, only the first should be marked.

2

(b) **[AO3 = 4]**

For each way:
2 marks for a clear and coherent way
1 mark for a limited / muddled way
0 marks for simply stating a way

Possible improvements: how the experiment could be improved (this might include why this would be an improvement).

- improving the sample / sampling method / target population – details of alternative method, e.g. stratified
- changing the design – use of an alternative design (repeated measures, matched pairs) and brief details of how this would be implemented
- changing the nature of the tasks – suggestions for tasks that are more reflective of real-life behaviour, e.g. reading e-mails whilst talking on the phone, etc
- changing the type of experiment – suggestions for alternative, e.g. field study – carry out the research in a more natural setting, e.g. an office environment or a classroom
- participants should be randomly allocated to each experimental condition; brief explanation of how this would be done.

Credit other valid improvements.

4

[6]

Q4.

[AO3 = 4]

Level	Mark	Description
2	3-4	Discussion of strength is clear and coherent. For 3 marks, some detail / expansion may be lacking. Specialist terminology is used appropriately.
1	1-2	Discussion of strength is limited/muddled or briefly stated / outlined only. Specialist terminology may be used inappropriately or is absent.
	0	No relevant content.

Possible strengths:

- evidence supports the existence of separate stores in STM, e.g. KF; brain scanning evidence, e.g. Paulesu; dual-task performance, e.g. Baddeley et al. Evidence may be used to support general principles of model or specific stores / sub-components
- suggests STM is an active processor rather than the unitary ‘stopping-off station’ version presented by the multi-store model
- practical application, e.g. phonological deficits observed in dyslexia linked to articulatory loop.

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Credit counterargument as part of the discussion, e.g. supporting studies tend to involve artificial tasks.

Accept other valid strengths.

If more than one strength is presented, all should be marked and the best one credited.

[4]

Q5.

[AO1 = 6]

Level	Mark	Description
3	5-6	Knowledge of the cognitive interview is accurate and generally well detailed. The answer is clear and coherent. Specialist terminology is used effectively
2	3-4	Some knowledge of the cognitive interview is present but there may be some detail missing / lack of clarity. There is some appropriate use of specialist terminology.
1	1-2	Limited knowledge of the cognitive interview. The answer as a whole lacks clarity / accuracy. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

Knowledge of the cognitive interview.

- reinstating the context – interviewee mentally reinstates the environmental and personal context of the incident, e.g. sights, sounds, weather etc; (based on the principle of retrieval failure / cue-dependent forgetting that cues may trigger recall)
- report everything – interviewer encourages the reporting of every single detail of the event, even though it may seem irrelevant; (such detail may trigger other memories)
- changing order – interviewer tries alternative ways through the timeline of the incident; (reduces possibility that recall may be influenced by schema / expectations)
- changing perspective – interviewee recalls from different perspectives, e.g. how it would have appeared to other witnesses; (reduces influence of schema)
- features of enhanced cognitive interview to facilitate recall – focus on social interaction, reducing anxiety / distractions, slow speech, use of open-ended questions.

Simply listing aspects of the cognitive interview, maximum 2 marks.

[6]

Q6.

[AO1 = 6 AO3 = 6]

Level	Marks	Description

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4	10 – 12	Knowledge of what psychological research (theory and/or evidence) has shown about working memory is accurate and generally well detailed. Discussion is effective. The answer is clear and coherent. Minor detail and/or expansion is sometimes lacking. Specialist terminology is used effectively.
3	7 – 9	Knowledge of what psychological research (theory and/or evidence) has shown about working memory is evident but there are occasional inaccuracies/omissions. There is some effective discussion. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.
2	4 – 6	Limited knowledge of what psychological research (theory and/or evidence) has shown about working memory is present. Focus is mainly on description. Any discussion is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 3	Knowledge of what psychological research (theory and/or evidence) has shown about working memory is very limited. Discussion is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Content:

Full credit can be gained for theory and/or evidence.

- The working memory model proposed by Baddeley and Hitch in 1970s as an updated version of STM
- WM is understood as an active processor
- The components and their functions and properties; central executive; phonological loop/store (articulatory and acoustic processing); visuo-spatial scratchpad/sketchpad; episodic buffer. Credit diagram
- Description of what research evidence has shown/findings of studies/conclusions in relation to working memory in general or the different components including:
    - Concurrent/dual task studies
    - Articulatory suppression studies
    - Brain imaging research showing different areas of the brain are active when performing different types of task
    - Clinical evidence of selective impairments to STM

Possible discussion points:

- Explains how different cognitive processes interact
- Comparison with passive view of STM in the MSM
- Use of evidence to support or contradict the concept of working memory
- Discussion/evaluation of working memory research eg issues of validity in dual task research/scanning studies where tasks might be seen as unrealistic/artificial; sampling issues and generalisation

- Problem of testing/fully explaining the central executive
- Applications eg explains processing deficits like reading difficulties and offers possible routes to therapy

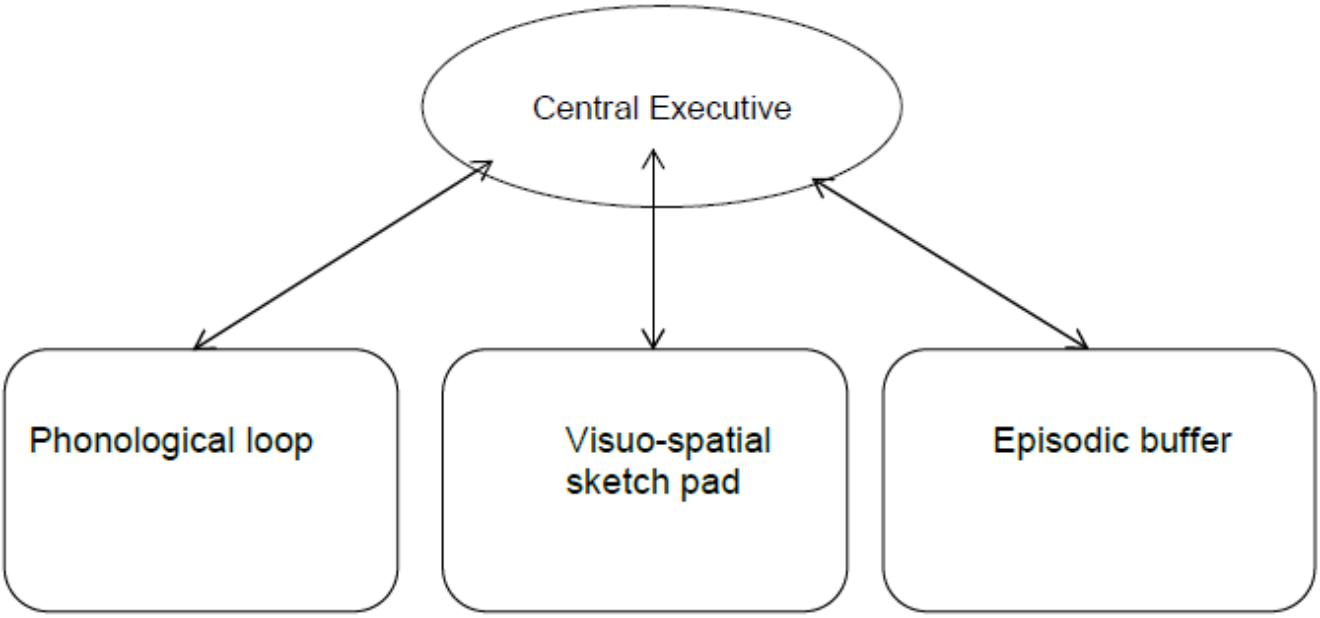
Credit other relevant material.

Note – ethical issues in relation to studies would not normally be relevant as they do not affect the understanding of working memory.

Q7.

[A01 = 4]

1 mark for naming each component correctly. The central executive will need to be in the correct position (top box) but the other three components can appear in any of the remaining boxes.



Accept also ‘phonological store’ and 'visuo-spatial scratchpad' as alternatives.

Q8.

[AO1 = 6 AO3 = 10]

Level	Marks	Description
4	13 – 16	Knowledge of components and functioning of model is accurate and generally well detailed. Evaluation is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	9 – 12	Knowledge of components of model is evident and there is some reference to function of model. There are occasional inaccuracies. Evaluation is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology mostly used effectively. Lacks focus in places.

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2	5 – 8	Knowledge of some components of model is present. Focus is mainly on description. Any evaluation is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology used inappropriately on occasions.
1	1 – 4	Knowledge of model is limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

AO1 Content:

- version of STM which sees this store as an active processor
- description of central executive and 'slave systems' – visuo-spatial scratch / sketch pad; phonological store / loop; articulatory loop / control process; primary acoustic store; episodic buffer (versions vary – not all of slave systems need to be present for full marks)
- information concerning capacity and coding of each store
- allocation of resources / divided attention / dual-task performance.

AO3 Possible evaluation points:

- strengths include: explains how cognitive processes interact; memory is active rather than passive; provides explanation / treatments for processing deficits; highlights different memory tasks that STM can deal with by identifying separate components; explains results of dual task studies
- limitations include: vague, untestable nature of the central executive; supported by highly controlled lab studies which may undermine the validity of the model
- use of evidence to support or refute the model
- credit other relevant evaluative points.

Only credit evaluation of the methodology used in studies when made relevant to discussion of the model.

Q9.

[AO2 = 4]

Level	Marks	Description
2	3 – 4	Knowledge of relevant features of the working memory model is clear and accurate. The application of these to the scenario is effective. At the top of the band there must be reference to both characters in the stem. Specialist terminology is used effectively.
1	1 – 2	Knowledge of relevant features of the working memory model lacks clarity/accuracy/detail. Application may be limited or absent. Specialist terminology is not always used effectively.

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	0	No relevant content.

Possible content:

- Reference to attentional capacity/capacity of the central executive – because driving is an 'automated' task for Bryan, it makes fewer attentional demands on his central executive so he is free to perform other tasks (such as talking or listening to music); this is not the case for Bob who requires all of his attentional capacity for driving.
- Credit reference to Bob's inability to dual-task and to divide resources effectively between components of working memory.
- Credit the idea that Bryan is able to divide resources between his visuo-spatial scratch / sketch pad (driving) and articulatory control process / articulatory / phonological loop / primary acoustic store (talking and listening to music) and thus to dual-task.

Accept other valid applications of the model.

Q10.

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- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

Although the essential content for this mark scheme remains the same, mark schemes for the new AQA Specification (Sept 2015 onwards) take a different format as follows:

- A single set of numbered levels (formerly bands) to cover all skills
- Content appears as a bulleted list
- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

AO1 = 4

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.
For 4 marks candidates should refer to components and processes.
Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

AO1 Knowledge of the working memory model
4 marks Accurate and reasonably detailed Accurate and reasonably detailed answer that demonstrates sound knowledge of the model.
3 marks Less detailed but generally accurate Less detailed but generally accurate answer that demonstrates relevant knowledge of the

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model.
2 marks Basic Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled.
1 mark Very brief / flawed Very brief (e.g. only naming 2 or more components), or flawed answer demonstrating very little knowledge of the model.
0 marks No creditworthy material.

Q11.

[AO1 = 2, AO2= 2]

AO1

Award up to two marks for relevant knowledge of the working memory model. Credit knowledge / identification of each store / sub-systems (not episodic buffer); the idea that two tasks using separate stores can be performed simultaneously; performing two tasks that involve the same store impairs performance.
Credit reference to limited capacity.
Credit reference to the allocation of tasks by the central executive.

Students may gain both marks by referring to specific stores or more general, relevant features of the model.

AO2

Up to two marks for application to the scenario.

For full credit answers must refer to both sets of tasks.

Possible answer: Claire is able to search for photos and listen to music as these tasks involve different sub-systems in working memory (1) – the visuo-spatial sketch / scratch pad and the articulatory / phonological loop / store / primary acoustic store (1). Claire finds it difficult to read her e-mails and talk on the phone as these tasks involve the same store (1) – the articulatory / phonological loop / store / primary acoustic store (1).

Q12.

AO1 = 6

The central executive has a supervisory function and controls the slave systems. It has limited capacity but can process information from any sensory modality.

The phonological loop is a limited capacity, temporary storage system for holding verbal information in a speech based form.

The visuo-spatial sketchpad is a limited capacity, temporary memory system for holding visual and spatial information.

In each case 1 mark for a brief answer eg the visuo-spatial sketchpad holds visual

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and spatial information. 2nd mark for accurate elaboration or an example of how it might be used.

Within each component award a maximum of 1 mark for simply naming 1 or more parts eg phonological store (inner ear), articulatory process (inner voice) in the phonological loop, or inner scribe, visual cache in the visuo-spatial sketchpad.

Q13.

AO2 = 3

Participants would find it hard to do two visual tasks at the same time because they would be competing for the same limited resources of the visuo-spatial sketchpad. However, a visual task and a verbal task would use different components.

1 mark for a very brief or slightly muddled explanation eg both visual tasks use the visuo-spatial sketchpad. Further marks for accurate elaboration. For full marks students must refer to both conditions.

Q14.

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- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

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- A single set of numbered levels (formerly bands) to cover all skills
- Content appears as a bulleted list
- No IDA expectation in A Level essays, however, credit for references to issues, debates and approaches where relevant.

AO1 = 4

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.
For 4 marks candidates should refer to components and the relationship between them.
Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

AO1 Knowledge of the working memory model
4 marks Accurate and reasonably detailed Accurate and reasonably detailed answer that demonstrates sound knowledge of the model.There is appropriate selection of material to address the question.
3 marks Less detailed but generally accurate

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Generally accurate but less detailed answer that demonstrates relevant knowledge of the model.There is some evidence of selection of material to address the question.
2 marks Basic Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled. There is little evidence of selection of material to address the question.
1 mark Very brief and/or flawed Very brief or flawed answer that demonstrates very little knowledge of the model. Selection of material is largely inappropriate.
0 marks No creditworthy material.

Q15.

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

AO2 = 4

Likely strengths include research support such as dual task studies and physiological evidence from brain scans. Candidates may offer a comparison with the MSM and suggest WMM gives a better account of STM. Strengths may include practical applications of the model eg the phonological loop plays a key role in the development of reading, and working memory capacity might be used as a measure of suitability for certain jobs.

Likely limitations include the fact that little is known about how the central executive works or evidence from brain studies suggesting the central executive is not unitary. The model doesn't account for musical memory because participants can listen to instrumental music without impairing performance on other acoustic tasks.
Simply stating that the model does not explain LTM is not credit-worthy as a limitation. However, stating that the link between WM and LTM is not fully explained is legitimate.

Credit any acceptable strength and limitation.
For each strength and limitation, 1 mark for identification. A further mark for accurate elaboration.
For example (strength), there is evidence from dual task studies to support the model (1 mark). It is easier to do two tasks at the same time if they use different processing systems (verbal and visual) than if they use the same slave system (2 marks).
For example (limitation), the central executive is too simple / vague (1 mark). The central executive is an important / vital part of the model but its exact role is unclear (2 marks).

Q16.

[AO1 = 2]

Up to 2 marks for an outline of two features of the working memory model.
Central executive – oversees the activity of the subsystems, an attentional system,

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retrieves information from LTM.
Articulatory loop / articulatory control process / articulatory rehearsal process – is a verbal rehearsal system / inner voice.
Primary acoustic store / phonological store – is a sound-based system / inner ear.
(these may be subsumed under Phonological loop – the sound system)
Visuospatial scratch / sketch pad – where visual and spatial information is imaged and manipulated / inner eye.
Episodic buffer – where information from each subsystem can inter-connect.
Allow broader features of the model including parallel processing, limited capacity, active processing in STM.
Maximum of 1 mark for only naming two components.

Q17.

[AO1 = 2]

Up to 2 marks for a description of the procedure / method. Typically a full answer will include the two conditions of the study.

Possible answers:
In one study, participants in Condition 1 were asked to memorise a series of letters while participants in Condition 2 were asked to rehearse the sounds of the letters in their heads. All the participants had their blood flow in their brains measured by PET scan while doing the tasks.
In a study, participants in one condition were asked to play a computer game using a joystick while carrying out a visuospatial distracter task. In the other condition participants played the same game but they had to carry out a verbal memory distracter task.

Q18.

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- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

[AO1 = 1, AO2 = 2]

AO1

One mark for one strength of the working memory model. Likely points: the model helps to explain how cognitive processes interact / memory is an active rather than passive process / it provides explanation and possible treatment programmes for people with processing deficits / it highlights the different memory tasks that STM can deal with by identifying separate components. Can explain the results of dual task studies.

AO2

Up to 2 marks for an explanation of how / why the issue chosen is a strength. Credit comparison with other models.
Credit use of evidence as part of the explanation.

Q19.

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AO1 = 4

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer.

The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.

Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuo-spatial sketch pad.

For 4 marks candidates should refer to components and the relationship between them eg central executive as a control system of slaves.

Candidates may include a diagram. If this is accurately labelled and sufficiently detailed, this can potentially receive the full 4 marks.

AO1 Knowledge of the working memory model
4 marks Accurate and reasonably detailed Accurate and reasonably detailed answer that demonstrates sound knowledge of the model.
3 marks Less detailed but generally accurate Less detailed but generally accurate answer that demonstrates relevant knowledge of the model.
2 marks Basic Basic answer that demonstrates some relevant knowledge of the model, but lacks detail and may be muddled.
1 mark Very brief / flawed Very brief or flawed answer demonstrating very little knowledge of the model eg simply naming one or more components.
0 marks No creditworthy material

Q20.

Please note that the AOs for the new AQA Specification (Sept 2015 onwards) have changed. Under the new Specification the following system of AOs applies:

- AO1 knowledge and understanding
- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

AO2 = 2

Likely limitations include: little is known about how the central executive works; evidence from brain studies suggesting the central executive is not unitary; it fails to account for musical memory because we are able to listen to instrumental music without impairing performance on other acoustic tasks.

Simply stating the model does not explain LTM is not credit-worthy. However stating the link between WM and LTM is not fully explained is legitimate.

Stating the model is too simple (with no accurate elaboration) is not credit-worthy.

1 mark for identification eg the central executive is too simplistic. A further mark for accurate elaboration.

Q21.

Marks for this question: AO1 = 6, AO3 = 10

Level	Marks	Description
4	13 – 16	Knowledge is accurate and generally well detailed. Discussion / evaluation / application is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	9 – 12	Knowledge is evident. There are occasional inaccuracies. Discussion / evaluation / application is apparent and mostly effective. The answer is mostly clear and organised. Specialist terminology is mostly used effectively. Lacks focus in places.
2	5 – 8	Some knowledge is present. Focus is mainly on description. Any Discussion / evaluation / application is only partly effective. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 4	Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology either absent or inappropriately used.
	0	No relevant content.

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a

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bulleted list.

AO1

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuospatial sketch pad or scratchpad.
Candidates should refer to components and processes.
Candidates may be credited for a diagram but description of the mechanisms involved should also be present.

AO3

Candidates are likely to evaluate the WMM in terms of its strengths and weaknesses. Likely strengths include use of research support such as dual task studies and physiological evidence from brain scans. Candidates may offer a comparison with the MSM and suggest WMM gives a better account of STM.
Likely weaknesses include the fact that little is known about how the central executive works or evidence from brain studies suggesting the central executive is not unitary. Stating that WM focuses too much on STM and not on LTM is not creditworthy, although suggesting it isn't a complete model of memory could be.
Genuine comparison / contrast with alternative models of memory is creditworthy, but description eg of MSM is not.

Q22.

Marks for this question: AO1 = 6, AO3 = 6

Level	Marks	Description
4	10 – 12	Knowledge is accurate and generally well detailed. Discussion / evaluation / application is effective. The answer is clear, coherent. Specialist terminology is used effectively. Minor detail and / or expansion of argument sometimes lacking.
3	7 – 9	Knowledge is evident. There are occasional inaccuracies. There is some effective discussion / evaluation / application. The answer is mostly clear and organised. Specialist terminology is mostly used appropriately.
2	4 – 6	Knowledge is present. Focus is mainly on description. Any discussion / evaluation / application is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 3	Knowledge is limited. Discussion / evaluation / application is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.

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	0	No relevant content.

Please note that although the content for this mark scheme remains the same, on most mark schemes for the new AQA Specification (Sept 2015 onwards) content appears as a bulleted list.

AO1

Candidates may describe the original 1974 version of the model or include later additions such as the episodic buffer which was added in 2000.
The working memory model replaced the idea of a unitary STM. It suggests a system involving active processing and short-term storage of information.
Key features include the central executive, the phonological loop (consisting of two components, the phonological store and the articulatory control process), and the visuospatial sketch pad or scratchpad.
Candidates should refer to components and processes.
Candidates may be credited for a diagram but description of the mechanisms involved should also be present.

AO3

Candidates are likely to evaluate the WMM in terms of its strengths and weaknesses.
Likely strengths include use of research support such as dual task studies and physiological evidence from brain scans. Candidates may offer a comparison with the MSM and suggest WMM gives a better account of STM.
Likely weaknesses include the fact that little is known about how the central executive works or evidence from brain studies suggesting the central executive is not unitary. Stating that WM focuses too much on STM and not on LTM is not creditworthy, although suggesting it isn't a complete model of memory could be.
Genuine comparison / contrast with alternative models of memory is creditworthy, but description eg of MSM is not.

Q23.

AO1 = 2

C and D are features of the WMM. A and B are not.
1 mark for each correct answer. If more than 2 boxes are ticked, 0 marks.

Q24.

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- AO2 application (of psychological knowledge)
- AO3 evaluation, analysis, interpretation.

AO2 = 4

Candidates may refer to the original 1974 version of the model, later additions, or may include the episodic buffer which was added in 2000.
Likely strengths include research support such as dual task studies and physiological evidence from brain scans. Candidates may offer a comparison with the MSM and suggest WMM gives a better account of STM.

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Likely weaknesses include the fact that little is known about how the central executive works or evidence from brain studies suggesting the central executive is not unitary.
Simply stating the model does not explain LTM is not credit-worthy as a weakness.
However, stating that the link between WM and LTM is not fully explained is legitimate.
Credit any acceptable strength and weakness.
For each strength and weakness, 1 mark for identification. A further mark for accurate elaboration.
For example, there is evidence from dual task studies to support the model (1 mark). It is easier to do two tasks at the same time if they use different processing systems (verbal and visual) than if they use the same slave system (2 marks).

Q25.

(a) **AO2 = 4**

The visuo-spatial scratchpad (sketchpad) stores / manipulates visual and spatial information and will be active when the person is doing a visual task. The phonological loop, comprising the phonological store (inner ear) and articulatory control system (inner voice) will be active during a verbal task.

1 mark for accurate identification of at least two components, eg central executive, visuo-spatial sketchpad / scratchpad and phonological loop (or a sub-component).
Credit an accurate diagram.
1 mark for a very brief or muddled explanation.
Up to 2 further marks for an accurate explanation.

(b) **AO2 = 2**

Likely examples for a verbal task include learning / repeating words, speaking and reading.
Visual tasks include forming an image of something and answering questions about it or mentally counting the windows of a house, watching DVD, reading.

Credit any acceptable tasks which are clearly verbal or visual.

To be appropriate in this context, the verbal and visual tasks must be different. However, some tasks, eg reading, could be verbal or visual.

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Q1.

At the top end were some extremely accurate and well-described answers, showing very good knowledge. Such answers referred to the type of material encoded, the sub-division into phonological store and articulatory process. These answers could go beyond simply naming and were able to explain their role. Weaker answers confused aspects of STM with the multi-store model.

Q2.

Most students could suggest one way, that the working memory model was not a unitary store.

Q3.

Part (a) was straightforward with most students receiving maximum marks.

A key term in part (b) was ‘Briefly explain’, meaning that simply stating a way the experiment could be improved received no credit. Popular ways were different sampling methods to improve representation, and use of matched pairs / repeated measures. There was substantial variation in how these could be implemented, but many answers showed good understanding of the underlying principles of design, sampling and control. A number of students referred to the use of more realistic tasks, and the use of field studies. These were credited to the extent that they were practicable.

Q4.

There were various ways this question could be answered. Probably the most effective was reference to evidence from case studies. Although some students confused KF with HM and Clive Wearing, in general KF was used well to illustrate the possible roles of phonological loop and visuo-spatial scratchpad. Dual task performance was another effective approach. General outlines comparing the complexity of the working memory model with the multistore model of STM could do well, but sometimes lacked a focus on one strength.

Q5.

Overall this question was done well with most students showing good knowledge of the techniques used in the cognitive interview. An effective route (though not essential) to the top band was to briefly explain why a technique was effective i.e. referring to context-dependent recall, reducing the influence of schemas etc.

Q6.

Most students presented a combination of theory and research evidence. The quality of extended writing varied enormously, with many students evidently struggling to describe such abstract ideas using specialist terminology. Whilst it was quite legitimate to focus on studies of working memory, with credit awarded for what the research 'has shown', it was most appropriate to focus on the findings/conclusions rather than on elaborate detail of the method. Confusion was often evident, particularly in relation to the outcome of dual task studies. Discussions were often based on the use of evidence to support the working memory model, although explanations of how the findings supported the theory were often missing or confused, with relatively few students touching on the key issue of limited

capacity. Generic evaluation points were frequently seen and did not contribute to the overall worth of answers. A number of students misinterpreted this as a question about the multistore model and a surprising number of answers included discussions of long-term memory.

Q10.

Answers to this question were varied. Many students described the model both accurately and in great detail often including appropriate reference to the episodic buffer component of the 2000 model (indeed some answers were more appropriate for a 6 mark question). Others merely named the components. It was acceptable for students to present their answer in the form of a diagram, and when this was accurately labelled and sufficiently detailed this could potentially receive full marks. However, attempts to describe the model in terms of parts being ‘on the left’ or ‘on the right’ often lacked clarity. There was also a tendency to leave out any reference to the processes of the model. Very few answers mistakenly described the multi-store model.

Q11.

This was generally a high scoring question. Most could identify at least two components of the model and applied these successfully to at least one pair of tasks. There was some confusion about the components of the working memory model used in Claire’s tasks and about the location of the limited capacity involved in the second of them.

Q12.

Some students did little more than name the sub-components of the phonological loop and visuo-spatial sketchpad. Others were able to outline the functions of the components, with perhaps the central executive being least well addressed.

Q13.

This was an applied question requiring students to explain why, according to the working memory model, those doing two visual tasks did less well. Many students wanted to give a detailed answer to this question that was much longer than was appropriate for a three-mark answer. Although many responses showed a clear understanding of the model, quite a few failed to address *why* there would be a problem in carrying out two visual tasks using the same processor. Some students cited studies of dual processing tasks, but did not make their answer explicit in respect of the question.

Q14.

This was typically answered well apart from the inevitable few who described the multi-store model. Some students did not score full marks because their answer was inaccurate in identifying the structure and / or processes of the working memory model.

Q15.

The strength was usually answered well by students who referred to supporting evidence, the practical applications of the model or who made a favourable comparison of the working memory model relative to the multi-store model. The limitation was addressed effectively where students pointed to the difficulty of designing research to measure the capacity or unitary functioning of the Central Executive. Students were not credited for claiming a limitation of the working memory is that it did not explain the long term memory (LTM) or incorrectly claiming a weakness was that it was based on case studies. Although such neuropsychological studies have been used as support of the working model they

are not the basis of the model.

Q16.

Most students were able to outline two features of the working memory. Credit was also awarded for outlining broader 'features' of the model such as 'limited capacity' or 'dual-task performance', alongside the more obvious sub-systems / components. Some students merely provided a list of named features and received a single mark only.

Q17.

This was one of the less well answered questions on the paper. Many students described class exercises in an anecdotal fashion rather than recognised studies, for example, '*close your eyes and count the number of windows in your house…'* Those students who did outline genuine investigations tended to confuse or omit important information, such as detail of both conditions of the study, to the detriment of the answer. Of the full-mark answers that were seen, the Hunt (1980) study was a popular choice.

Q18.

Again, a question that many students found difficult. Most were able to state a relevant strength (usually, *'the model is a more detailed version of short-term memory')* but few were able to develop this into a coherent explanation. Those who did often drew contrast with the passive and / or unitary nature of short-term memory described within the Multi-store model. There were some excellent accounts of how the model can help account for phonological deficits linked to difficulties with reading, but these were few in number.

Q19.

Candidates who could summarise information and write concisely, produced excellent answers. Others had difficulty producing a concise answer and spent more time than was needed, writing a long answer which continued onto an extra page. Some candidates were not able to correctly spell the basic components of the model obscuring the clarity of their answer. A few candidates produced an irrelevant answer about the multi-store model.

Q20.

Focus was mostly given to the central executive and the difficulty of investigating its exact function. A few candidates are still saying this model does not explain long-term memory, which is not credit-worthy.

Q21.

Apart from a few who described and evaluated the MSM most had some idea about WM. For a substantial number the description was limited to the components of WM with very little about the processes involved. A diagram helps to show the relationship between components and is credit-worthy. The model has been revised several times since the original (Baddeley and Hitch,1974) particularly by Baddeley in 2001. Any version is acceptable.

Many answers suggested that students had been taught evaluation of WM but did not fully understand it. So, for example, students described dual task experiments but did not say why these supported the notion of different short term stores. Some described one part of a dual task experiment (such as doing two visual / spatial tasks) without the contrast (one visual and one verbal) – this makes the information basic rather than reasonable or effective as it doesn't really help evaluate the model. Another common error was to

suggest it is easier to do two similar tasks compared with two dissimilar. There was also a tendency to describe evidence without explaining how it contributed to the evaluation. Some answers accurately explained the word length effect but did not link it to the phonological loop and its limited duration.

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Q23.

No report was produced for this question.

Q24.

Many answers used evidence from neurological research or brain injury studies to demonstrate that the strength of WMM lay in supporting studies. Other appropriate answers referred to dual task research and their implications for supporting the model. Weaknesses were less well explained. The central executive was sometimes unjustly referred to as lacking any evidence to support it. Just to say the WMM did not explain LTM was not credit-worthy.

Some answers failed to gain full marks as they did not elaborate on the weakness of model which they identified. For example, they simply stated that little was known about the central executive.

A few candidates confused the working memory model and multi-store model.

Q25.

(a) This question was answered well when candidates knew what the working memory model was, and were able to apply their knowledge effectively. Some candidates wasted time by giving a detailed description of the model, which was not required.

(b) Most candidates selected appropriate tasks and gained full marks. Occasionally candidates' answers could not receive credit, eg listening to music for a verbal task.

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