

# **How do regular opportunities for informal testing impact upon knowing more, remembering more and children's ability to articulate taught content whilst making links to previous learning in humanities?**

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## **Abstract**

As part of an ongoing focus on increasing long term retention of skills and concepts, as well as our drive on promoting oracy and articulacy, a research study has been undertaken to assess the impact of regular, informal testing of content taught in humanities lessons. These tests have been utilised to revisit recent and past content, allowing children to make links and consolidate their learning, utilising the vocabulary and ideas in lessons which took place in the Autumn and Spring terms. Roediger, H. L., III, & Butler, A. C, (2011) states that *'what we know from cognitive psychology strongly suggests that the act of retrieving information directly helps students learn. This benefit occurs even in the absence of feedback, and in the absence of an opportunity to restudy the information'*. This created the premise for the study which was undertaken across KS2 using focus and control groups to measure impact. The outcomes of the study demonstrated increased retention for those groups which undertook informal, regular testing.

## **Introduction**

The purpose of the study was to ensure an accessible, manageable way to enhance teaching and learning already in place and for teaching teams to assert this as a checkpoint and measure that informed next step teaching with precision. The humanities curriculum is well established and provides a coherent progression to core learning in line with the National Curriculum 2014.

The choice of approach therefore was to establish multiple choice questions to provide a measurable and tangible data set. Whilst the educational limitations of multiple choice testing are obvious, for the purposes of retaining knowledge, they are a useful - and from the children's perspective - enjoyable tool for regular rehearsal of learning.

*‘Every time students retrieve information from memory and use it to answer a test question, they are potentially strengthening... and/or changing the representation of that information in memory (i.e. deeper understanding). Numerous studies have investigated the consequences of multiple-choice testing for learning [concluding that] multiple-choice tests will inevitably [benefit] learning [and retention]’,* Roediger, H. L., III, & Butler, A. C, (2011). If the key skills and knowledge have been well modelled, taught and learnt, they serve as an effective method by which to retain the core aspects of that knowledge in the long-term. Furthermore, they are quick to administer, easy to resource and reuse and can be accessed by the vast majority of KS2 children completely independently.

## **Research Process**

The research process started with collaborative meetings of year-group partner teachers to construct a framework of twenty questions which would adequately reflect the key learning, concepts and vocabulary for four humanities units (Autumn and Spring terms - see appendix for example). A selection of four credible answers were constructed per question to ensure the multiple choice tests would not simply permit a process of elimination. Furthermore, one question per each section would reflect the necessity of making credible links to other units with linked knowledge to subjects of a similar nature.

Initial baseline and final testing included a control group class in each year group, with which to compare final data. The classes which undertook the project completed a further 4 tests (question and subject order were randomised each time) over a period of 8 weeks. The software utilised was Kahoot, which provided a simple to access and easy to resource and edit base for multiple choice testing. Tests took an average of 10/15 minutes to complete, using iPads or laptops. No subsequent official ‘debrief’ or formal discussion of the test content took place after any of the tests for any of the year groups. Children were presented with a ‘live’ scoreboard of answers and subsequently of children who were most improved from previous tests. The process remained anonymous for children however and those who did not do well initially were not visible to the rest of the class.

The final test, which again included the control group class took place in early June 2021.

## Results

Year 6 focus	65%	Year 6 control	61%
Year 5 focus	42%	Year 5 control	38%
Year 4 focus	60%	Year 4 control	62%

### Baseline Test - Control Group

Baseline testing for all year groups showed clear and obvious trends; content which had been covered most recently was answered correctly with more frequency. Humanities topics undertaken during the Spring partial closure had the weakest response rate. The lower Y5 baseline may be attributable to the fact the baseline test was taken at home - whilst the completion rate was 100%, a lack of any input or supervision suggested that testing would be best implemented in a classroom environment.

A further four tests were undertaken for the chosen focus classes, followed by a final round of testing which again included the control group classes.

Year 6 focus	92%	Year 6 control	62%
Year 5 focus	70%	Year 5 control	42%
Year 4 focus	80%	Year 4 control	65%

Year 6 data showed an improvement of 27% over 8 weeks in the retention and 're-acquiring' of knowledge for the focus class, who undertook 4 additional testing periods. The control Year 6 class, who received no further testing (other than the baseline and final test) showed a negligible 1% improvement in scores. All Year 6 testing was conducted at school, with no subsequent official 'debrief' or discussion of the test content after any of the tests. Children in Year 6 nonetheless openly discussed test content in their own time and exchanged experiences related to the process and knowledge of the tested content.

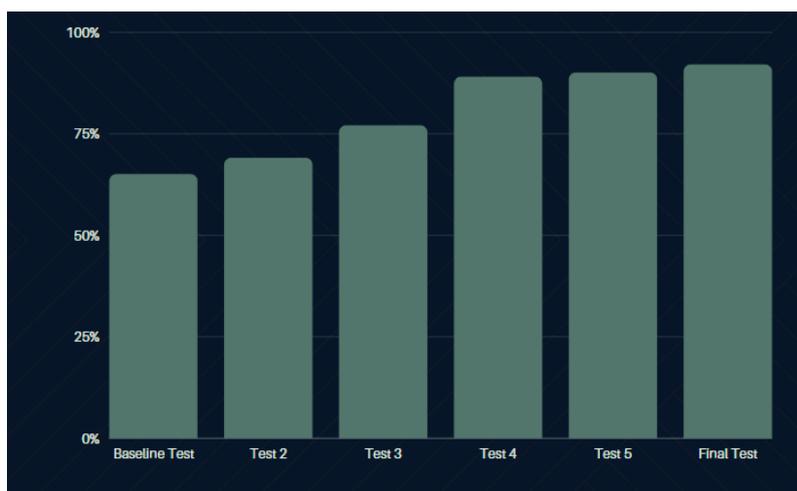
Year 5 data showed an improvement of 28% over 8 weeks in the retention and 're-acquiring' of knowledge for the focus class, which undertook 4 additional testing periods. The control class who received no further testing (other than the baseline and

final test) showed a negligible 4% improvement in scores. Of the additional 4 extra testing periods for the control class, 2 were taken at home as an additional homework assignment. This may account for the proportionally lower final percentage of correct answers in the final test. The overall improvement percentage is nevertheless in line with the other year groups, albeit from a lower starting point. No subsequent official 'debrief' or formal discussion of the test content took place after any of the tests. Children in Year 5 nonetheless openly discussed test content in their own time and exchanged experiences related to the process and knowledge of the tested content.

Year 4 data showed an improvement of 20% over 8 weeks in the retention and 're-acquiring' of knowledge for the focus class, which undertook 4 further testing periods; The control class received no further testing (other than the baseline and final test) showed a negligible 3% improvement in scores.

### **Progression data over 8 weeks**

The above Year 6 data shows trends which were similar in nature to those in Year 4 and 5; a gradual increase in scores followed by a natural plateau towards the end of the testing process. At this point, there was a far smaller range in questions answered incorrectly. These tended to be relatively specific to certain vocabulary or topic areas (see appendix).



### **Conclusion**

Though the research was conducted over a relatively short time period of 8 weeks, the difference in results between the focus classes and control groups were significant. The average increase in the percentage of correct answers was 25% across the three

year groups. This increase came at a relatively insignificant commitment of time and resources for both teachers and children. Tests were easy to set up and randomise (questions were presented in a different order each time) and actual testing (which could utilise iPads) took 10/15 minutes to complete on each occasion. For a total time commitment of just under an hour over an 8 week period, children memorised an extra 20-30% of the key learning points of the humanities content taught in the Autumn and Spring terms.

Significantly, questions based on content taught in the Autumn term saw similar improvement in the percentage of correct answers to that of the Spring topics. This suggests that the methodology and testing process was equally successful for the rehearsal of content taught a significant time ago and not just a tool for 'rekindling' knowledge learnt a short time prior. Furthermore, it was encouraging to witness a gradual improvement in scores for SEN/LA pupils across the three year groups, showing that this casual testing method was effective for a large cohort of children of varying ability.

Finally, children were openly enthused, excited and engaged by the informal testing methods. Kahoot provides a 'live' scoreboard during the test (after each question) and a final ranking system which highlights the top children as well as those 'most improved'. This presented a competitive yet stress free format in which children who had initially performed poorly remained anonymous to their peers, yet were highlighted for their improvement in subsequent tests.

Ensuing discussions with children who participated in the testing process, highlighted comments which further confirmed the enjoyable and rewarding nature of the task. Furthermore, children were clearly more able and willing to discuss their humanities learning based on the key questions tested, whilst actively using the key vocabulary embedded and utilised in the questions and answer testing process.

It is my belief that this informal testing method could easily and with little effort be introduced by teachers in the next academic year to consolidate learning and greatly aid our federation target of getting children to 'know more and remember more'. With a relatively minor commitment of time and resourcing, children could retain key

learning points in an engaging and enjoyable way, providing teachers with an instant assessment tool to reflect on gaps in knowledge and vocabulary, (see appendix).

## References

Butler, C. (2018). Multiple-Choice Testing in Education: Are the Best Practices for Assessment Also Good for Learning? *Journal of Applied Research in Memory and Cognition, Volume 7, Issue 3*

Roediger, H. L., III, & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences, 15*

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science, 17*

## Appendix

### Baseline and Final Test Questions (example)

Question	Type	Correct/Incorrect
13 How do we measure a countries wealth?	Quiz	93%
12 What does the colour black represent on the Ghanaian flag?	Quiz	93%
8 What are the three Rs of sustainability?	Quiz	93%
9 What is sustainability?	Quiz	89%
17 Who were the Allies and the Axis?	Quiz	86%
11 What countries neighbor Ghana?	Quiz	79%
19 How did the Blitz impact Londoners?	Quiz	79%
4 What evidence of evolution did Darwin find on the Galapagos?	Quiz	77%
7 What is a renewable resource?	Quiz	68%
14 What impacts most on life expectancy?	Quiz	68%
2 How did the Galapagos islands form?	Quiz	68%
6 How does urbanisation impact on the environment?	Quiz	64%
3 What is the process of natural selection?	Quiz	64%
5 What conditions help form a fossil?	Quiz	57%
20 How did industrialization help the Allies win the war?	Quiz	54%
18 Why did the Germans vote for Adolf Hitler in 1933?	Quiz	43%
16 The invasion of which country triggered World War II?	Quiz	39%
10 What impact did the Chernobyl disaster have?	Quiz	36%
15 How has urbanisation contributed to Ghana becoming wealthier?	Quiz	36%
1 Where are the Galapagos islands located?	Quiz	29%

Question	Type	Correct/Incorrect
19 How did the Blitz impact Londoners?	Quiz	100%
14 What impacts most on life expectancy?	Quiz	100%
13 How do we measure a countries wealth?	Quiz	100%
16 The invasion of which country triggered World War II?	Quiz	96%
20 How did industrialization help the Allies win the war?	Quiz	96%
10 What impact did the Chernobyl disaster have?	Quiz	96%
4 What evidence of evolution did Darwin find on the Galapagos?	Quiz	96%
3 What is the process of natural selection?	Quiz	96%
8 What are the three Rs of sustainability?	Quiz	96%
7 What is a renewable resource?	Quiz	96%
18 Why did the Germans vote for Adolf Hitler in 1933?	Quiz	92%
17 Who were the Allies and the Axis?	Quiz	92%
15 How has urbanisation contributed to Ghana becoming wealthier?	Quiz	92%
12 What does the colour black represent on the Ghanaian flag?	Quiz	88%
11 What countries neighbor Ghana?	Quiz	88%
2 How did the Galapagos islands form?	Quiz	88%
1 Where are the Galapagos islands located?	Quiz	88%
6 How does urbanisation impact on the environment?	Quiz	88%
9 What is sustainability?	Quiz	83%
5 What conditions help form a fossil?	Quiz	83%