

CLEVELAND ROAD PRIMARY SCHOOL: LESSON STUDY RESEARCH EVALUATION REPORT

Research Question:	<i>How does allowing children to create their own scientific word mat impact on middle ability boys' usage of scientific vocabulary?</i>
Who was involved? (Include job roles)	Ms Jones, Ms Evans and Ms Pereria (all equal as observers and teachers as part of the lesson study process)

ABSTRACT
<i>This research would be particularly useful for anyone who feels that their class is struggling in Science, particularly when using scientific vocabulary. From past experience at Cleveland Road Primary School, I know many children that would avoid using Scientific vocabulary through worry of using it incorrectly and from lack of understanding.</i> <i>Overall, there was a positive impact seen, on not only boys' usage of scientific vocabulary, but on the whole class, too. Evidently, allowing the children to take ownership ensured that they were actively engaged and did not have the opportunity to be passive – they have to take an active role in matching the statements to the definition and arranging these in a way they deem relevant to them when creating their own word mat.</i>

AIMS
(a) The reasons for undertaking this lesson study project
<i>An increased confidence in all pupils (particularly focusing on boys) when using scientific vocabulary</i> <i>An active attempt from children to use scientific vocabulary provided to them</i> <i>An increase in children's active discussion with each other regarding pre-learned and newly acquired vocabulary</i> <i>Developed confidence in children when applying scientific vocabulary</i> <i>Overall, as a whole school, an increase in both attainment and progress in Science</i>
(b) The identified target learners
<i>Over 90% of our children are EAL learners and therefore our choice of children was selected from this category</i> <i>In particular, we focused on middle-ability boys, as from experience, we found that these children were reluctant to use key scientific vocabulary to enhance their explanations</i>
(c) How we intended to improve children's learning
<i>We wanted a positive impact on children learning by ensuring that the children felt that they had ownership over their resources during the lesson. We wanted the children to see what a difference they can make to their learning by becoming independent learners and having an increased participation in discussion, as in turn this should have a positive impact on their usage of key scientific vocabulary. Overall, for each child, we wanted their engagement with key vocabulary to improve along with their understanding of the terms.</i>
(d) The success criteria for the research lessons
<i>An increase in engagement with key vocabulary, including an increase in participation by all children during group and class discussions</i> <i>An increase in confidence when using scientific vocabulary</i> <i>A positive impact on children's engagement with key scientific vocabulary through usage in explanations and in set tasks</i> <i>An increase in the number of scientific terms being attempted by each child (even if understanding still wasn't completely correct)</i>

METHODOLOGY
(a) The teaching approaches we tried
Each lesson was very similar, with small adaptations to the one previously. Each one of us began by asking the children to write a paragraph using as many of the key scientific words on the board that they could. This activity has been a starter task that we have been encouraged to use to elicit children's understanding of a topic, prior to us teaching it. After that, we provided children with some key scientific vocabulary and the definitions of these terms, which the children had to match up when working in their groups – actively engaging within group discussions, to determine which terms matched with which definitions. In this first session, children were encouraged to create their own word mat, as a group, that they would be able to use throughout the topic, rather than the class teacher creating the word mat for them (to promote independence). In the time between each lesson study lesson, each class then engaged with some other activities to provide them with some time to experience using the key vocabulary that we had provided. In the end, we asked the children to edit, revamp or rewrite their paragraph to show what they now understood from the topic, including the scientific vocabulary with which they had been provided.
(b) Specific resources we tried
- We used research from the TDT network to develop our new approaches - We used curriculum documents to decipher the key vocabulary that we should be teaching to children - Throughout the teaching process, there were videos and discussions had with the children regarding their scientific topic

OUTCOMES AND IMPACT
(a) The Impact on pupil learning
Overall, the impact on pupil learning was positive as there was an increase in the amount of scientific vocabulary that the children were making use of in their updated and edited paragraphs at the end of their unit of study. Children's confidence was increased - as one child said, "I wouldn't have wanted to show you before because I didn't know the words, but now I know that I am right in what I've written because I used the word map to help me." Most children were proud of both the word mat that they had created and the quality of the new paragraph that they had written. In almost all cases, children had not been happy to show their paragraphs at the beginning whereas, at the end, they were proud of what they had achieved and felt that they had tried their best.
(b) Evidence of impact on pupil learning
Children's confidence has clearly increased. By the second lesson, they were inspired to use the word mat and automatically referred to this information before and during the writing of their own paragraphs. Although not all children were correct in their understanding and application of the scientific vocabulary, there was an increased attempt at using the word mat and the vocabulary to enhance their paragraphs..
(c) Impact on teaching
We believe that it is key for us to elicit where children are in their knowledge before a topic. However, with the particular topic that we were teaching, there was very little prior knowledge that the children had, meaning that the paragraph task at the beginning was almost impossible. Therefore, we believe that were we to carry out a similar lesson study again, we would consider a different approach, dependent upon the topic being taught. However, we do believe that allowing the children to create their own word mat is something that we need to look at doing in the future. This does not always have to be done in the same manner, as we do not believe that doing this each time would have a positive impact – it could have an adverse effect. We think that further research into activities such as this could take place depending on the topic being taught. After refining and improving our delivery, more impact was seen, particularly with regards the promotion of independence – children were encouraged to take an active role in their learning.

(d) Evidence of impact on teaching
<i>There was more discussion between table groups and the children, rather than an overreliance on the teacher – which in turn allowed us to go around each table group and support when and where needed. Children were encouraged to decipher meanings and use iPads to support them rather than going to the teacher, in the first instance, for help. During the word mat task, the children were actively engaged and encouraged each other to become involved. In the older year group, children assigned themselves roles in order to work more effectively and to complete the task. When it came to the children writing their paragraphs, they were extremely keen to do so independently. Moving forward, we would like to look at how we can improve understanding and correct application.</i>
(e) Impact upon school culture and leadership
<i>This should definitely be something that each teacher looks at embedding, in some shape, in his or her classroom. For the Science coordinator, this is a perfect opportunity to drive something forward that clearly has a positive impact upon the children's results and should, in turn, support children's reading and writing skills as it will improve their vocabulary and their understanding of the wider world.</i>
(d) Evidence of impact upon school culture and leadership
<i>The usage and application of scientific vocabulary in the classroom is something that has been a challenge for pupils at Cleveland Road Primary School and, therefore, we needed to figure out a way that we could improve this. It was clear that, once the children understood the key vocabulary, they were able to transfer this into everyday conversation and into completion of scientific write-ups and wanted to show that they could use the terms they had learnt. This will support children's understanding of the wider world overall and will improve both their comprehension in reading and their ability to write clearly and scientifically.</i>

CONCLUSIONS AND RECOMENDATIONS
(a) Our conclusions
<i>Allowing children to engage in creating their own word mat clearly had a positive impact on the children's (particularly boys') usage of key vocabulary, both in discussion and within the written tasks, where they demonstrated what they had learned, through usage and application of key vocabulary – although this usage was not always accurate and correct.</i> <i>This type of task allowed children to develop their independence as learners, as they had to take charge of how it was set out and arranged in order for it to be clear and useful.</i> <i>Children referred back to the word mat in every day conversation and made specific links to it in other subject areas.</i> <i>There was additional time taken to embed this understanding of the vocabulary, which could have an impact on teaching time. This needs to be weighed up with the constraints of delivering the content of the unit, but time may be saved if children know and have an understanding the key vocabulary for the unit.</i>
(b) Recommendations for other interested in researching this area
<i>As we have stated previously, the impact upon the teaching timescale for the topic would need to be considered. We could consider using this approach alongside an enquiry-based approach and activity, allowing children to develop their vocabulary whilst carrying out an investigation. This could provide a more purposeful and directed reason for the focus on vocabulary.</i>

BIBLIOGRAPHY
Husty, S. & Jackson, J. (2008) Multisensory strategies or Science Vocabulary. Science and Children. December 2008, Vol. 46 Issue 4, p32-35, available from: http://web.a.ebscohost.com/ehost/detail/detail?vid=2&sid=40f6d35e-cc1b-4295-b236-69edfe5c1937%40sessionmgr4009&bdata=JnNpdGU9ZWZwhvc3QtbGl2ZQ%3d%3d#AN=508018544&db=eue (accessed 5th July 2017) Jackson, J. & Narvaez, R. (2013) Interactive word walls: create a tool to increase scientific vocabulary in five easy steps. Science and Children 42 available from: http://static.nsta.org/files/sc1301_42.pdf (accessed 2nd July 2017)

Kuriloff, P., Reichert, M., Stoudt, B. & Ravitch, S. (2009) Building Research Collaboratives Among Schools and Universities: Lessons From the Field. *Mind Brain and Education*. 3 (1) 34-44. Available from: doi:10.1111/j.1751-228X.2008.01051.x (accessed 13th March 2017)

Lewis, C. (1998) A Less is like a Swiftly Flowing River: How Research Lessons improve Japanese Education. *American Educator*. Winter 1998. 12-17. Available from: <http://w.lessonresearch.net/> (accessed 13th March 2017)

Miller, J. (2010) Editorial: The language of Science is in Daily Conversation. *Science Activities* Vol.42 2. Available from: <http://dx.doi.org/10.3200/SATS.42.2.3-4> (accessed 2nd July 2017)

Miller, L., Straits, W., Kucan, L. & Dass, M. (2007) Literature Circle Roles for Science Vocabulary. *The Science Teacher* Summer 2007. Available from: Groves, F.H. 1995. Science vocabulary load of selected secondary science textbooks.

Rose, N. (2015) Evidence into practice: **Ethical issues in teacher-led research**. Available from: <https://evidenceintopractice.wordpress.com/2015/04/05/ethical-issues-in-teacher-led-research/> (accessed 5th July 2017)

Sarkar, M., Keisuke, F. & Lasseegard, J. (2010) "Lesson Study" as a Professional Culture in Japanese Schools: An Historical Perspective on Elementary Classroom Practices. *Japan Review*. 22 (1) 171-200. Available from: <http://www.jstor.org/stable/2579134> (accessed 13th March 2017)

Watanabe, T. (2002) Learning from Japanese Lesson Study. *Educational Leadership*. 59(6) 36-39. Available from: <http://search.ebscohost.com/> (accessed 13th March 2017)

Wessels, S. (2013) Science as a Second Language. *Science and Children*. September 2013. Available from: http://www.nsta.org/store/product_detail.aspx?id=10.2505/4/sc13_051_01_50 (accessed 13th March 2017)