

# How will the implementation of challenge activities in Literacy and Mathematics impact the end of year outcomes of children in Reception?

Southwold Primary School, EYFS

## Abstract

The purpose of this study was to explore the benefits of using additional challenge activities in Literacy and Mathematics. The aim was to help more able children to achieve exceeding judgments in these areas of learning by the end of the Reception year. The progress in 'reading', 'writing', 'numbers' and 'shape, space and measure' of key focus children assessed as 'at expected' in baseline assessment was tracked throughout the academic year to identify if the research focus impact outcomes. 78% of children in the focus group reached 'exceeding' judgments resulting in more than expected progress and 12% children met the Early Learning Goals (ELGs) meaning expected progress was achieved. The findings of the study show that carefully planned learning and appropriately differentiated activities, including additional challenge for more able children, developed greater confidence in independent learning and ensured typicality of exceeding judgements were met by the end of the Reception year.

## Introduction

Southwold is a two-form entry primary school in the London borough of Hackney, providing education for children between ages of three to eleven. The proportions of pupils from minority ethnic groups and those who speak English as an additional language are higher than the national average. The proportion of pupils eligible to receive the pupil premium is also higher than average. Most children start school with skills typically well below that expected for their age.

Two of specific areas of learning that show children are below age related expectation at baseline are Literacy and Mathematics. Teachers aim to ensure the expected percentage of the children achieving ELGs in these two areas is met by the end of the Reception year. It was noticed that the lower attainers are targeted more robustly to ensure they meet expected standards by the end of the academic year. In the light of this, the higher attainers often seem to be off the radar as they are naturally achieving the expected standards.

Common feedback from Autumn teacher observations noted the need for most able pupils to be consistently challenged. Sue Cowley identifies that *'for learners who are already way ahead of what the curriculum asks of them, differentiation is important for pushing them and keeping them challenged and engaged.'* The Ultimate Guide to Differentiation, Achieving excellence for all (2018) and this provided the platform for both discussion and development of research action.

Learning walks and discussions during weekly phase meetings indicated key strengths in the learning environment. Adults across the EYFS ensure that the needs of all pupils are met, and build in high expectations to ensure engagement in learning. Adults noted that it is not always possible to support more able children with challenge questions during independent learning. It had also become obvious that support staff commonly provide support for the less able children during carpet input.

Prior to the study, more able children were challenged by extension in the form of the questions during carpet input and self-directed activities (See Appendices 1 and 2). The challenge question was posed to the children during the teaching time or written on the learning intention card, which was placed on the table top. However, children were able to access the challenge only or most often with the support from an adult. It meant that challenge questions were not fully accessible at all times for more able children and stopped them from implementing their newly taught skills into their continuous learning.

Tina Bruce (2011) makes the point that children learn best when they are given appropriate responsibility, allowed to make errors, decisions and choices, and respected as autonomous learners. The research therefore focused on how to ensure the learning opportunities provide appropriate and accessible challenge for those children who demonstrate exceeding skills in literacy and mathematics without direct presence of the practitioner.

## Research Process

The research project was coordinated and led by the EYFS phase leader and supported by one Reception class teacher and two members of support staff. The study group consisted of twelve children from across the Reception year group. All of the children selected were assessed as being 'on track' at baseline in September. The research group children were targeted to access appropriately differentiated activities during whole class lessons, focus group activities and through challenge buckets while independently working at table tops during free-flow. Unfortunately, three children left school during the research window time, so the data was collected for the remaining nine children.

Teachers had to plan differentiated lessons where more able children would be given an opportunity to apply their skills independently or with the support from an adult during the lesson input. An engaging activity on the table top would be then the next step to apply their skills and to consolidate their learning (see Appendices 3 and 4). To allow this, challenge buckets were implemented (see Appendix 5).

The context of the challenge buckets is similar to the familiar use of the children's 'Mini Me's'. The 'Mini Me' concept is a child directed learning tool based from teacher assessment. For example, a child who might not be accessing a particular area of learning would be directly encouraged through the placing of a small picture of themselves on a table top to access specific learning. While adult placed, the responsibility lies with the child to complete the learning task. As a result, children were able to start using the buckets independently after introduction. They would find their name placed on the bucket on the maths or literacy table top and after completing the main task they would be allowed to look inside the bucket to find out what is the next activity for them to complete.

The importance of understanding that the challenge activity should be in line with the children's interests and have an element of play, and at the same time allow children to apply newly taught skills independently and in context. Buckets contained a variety of games, puzzles and materials related to various concepts within mathematics and literacy. This approach offered great opportunities for developing personalised learning as children could investigate particular areas of interest.

All staff received the training on how to pose the higher order questioning during free-flow and the main carpet input using the question matrix (Figure 1) as well as briefed on how to use the challenge buckets and provide the support to the children, if and when necessary.

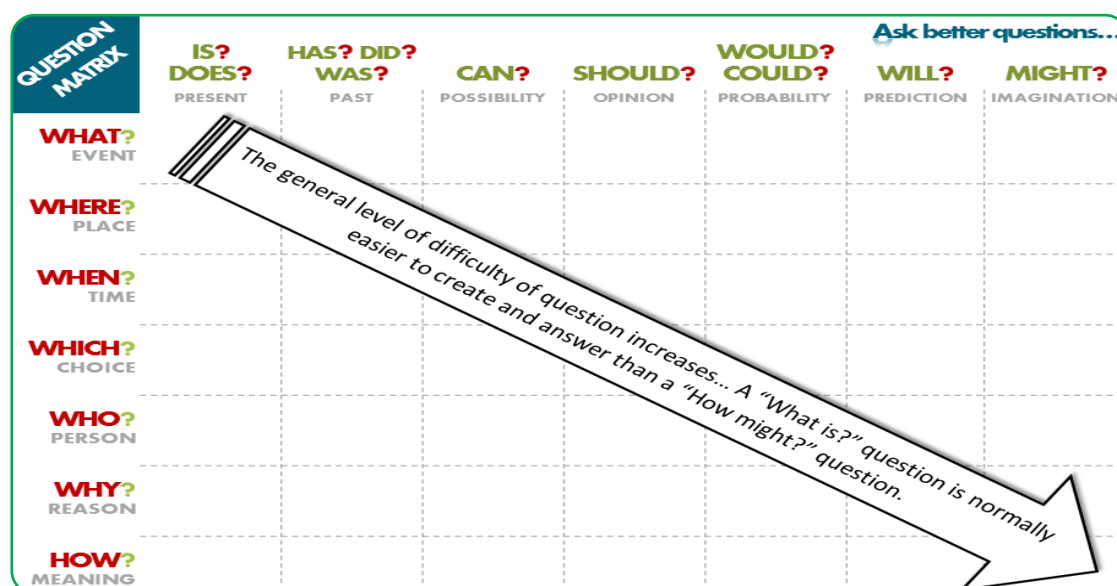


Fig.1. question matrix

Weekly phase meetings were held, which provided the opportunity for dialogue between practitioners. It also allowed the phase leader to evaluate the study as it developed, making any necessary changes if or when needed. The phase leader monitored the implementation of the challenge activities in both carpet input, evidenced in the planning, and on the table tops. The appropriately differentiated focus groups were also one of the main focuses and were monitored accordingly.

Following the baseline assessment in September, the nine children still involved in the project were assessed again in December and again in May. Children were assessed using the Development Matters assessment criteria for 'Reading', 'Writing', 'Number' and 'Shape, Space and Measure'. At the end of the research project practitioners and children shared their views about the introduction of challenge activities.

## Findings

Although Reception staff reported that it took more time at the beginning to plan an additional activity for the challenge buckets, it has become clear that more able children were able to access the challenge with increasing independence over time, which allowed adults to continue focus on learning facilitation for lower attaining children both during carpet input and free-flow. During discussions all practitioners agreed that it is crucial to plan challenge activities for more able children. The use of open ended activities and higher order questions allow children to develop their critical thinking and ability to comply with challenging situations. Staff also agreed that more able children should be considered in the same way as other additional support needs. At the end of the research projects teachers noticed that many of the activities on offer for all children could be easily amended to provide high end challenge for more able children and it did not feel as an additional workload during planning time anymore.

Children have demonstrated great interest in the challenge buckets and were able to use the provided activities independently during free-flow most of the time. They proved the ability to be engaged and fulfil their potential independently, which made them feel proud and self-motivated. It was noticed that during carpet input more able children had become focussed and engaged at all times, where before the challenge was implemented, they used to demonstrate disengagement after completing the main task ahead of the rest of the class.

It is expected that children achieve a Good Level of Development (GLD) by the end of the Reception year. If children are on track to meet the end of year expectations they should be '40-60 Developing' at the interim assessment. More than two bands progress would be considered more than expected progress. More able children were challenged in line with 'exceeding' judgments. All children made significant progress in mathematics and literacy. The data compiled of baseline assessment, interim and the end of year assessment in Figures 2, 3, 4 and 5 shows that seven out of nine children achieved exceeding judgements in all areas assessed during the research window. The other two children met GLD judgements.

### Key:

1: 30-50 Developing	2: 30-50 Secure	3: 40-60 Emerging	4: 40-60 Developing	5: 40-60 Secure	6: Exceeding
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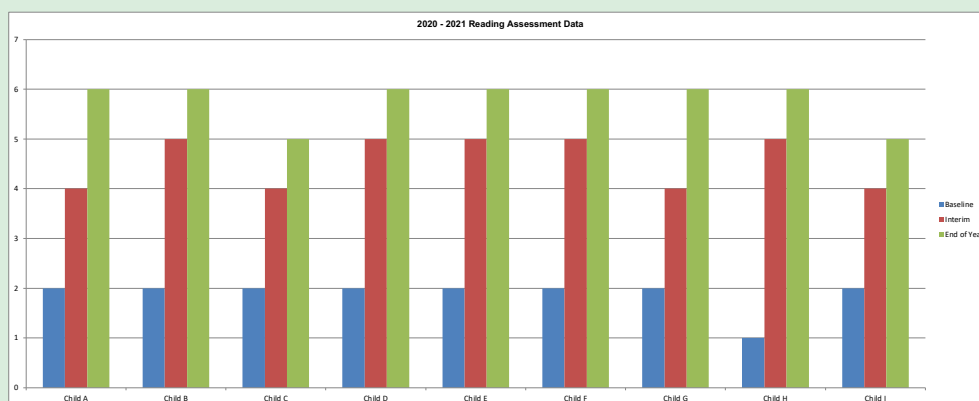


Fig. 2. Reading assessment data

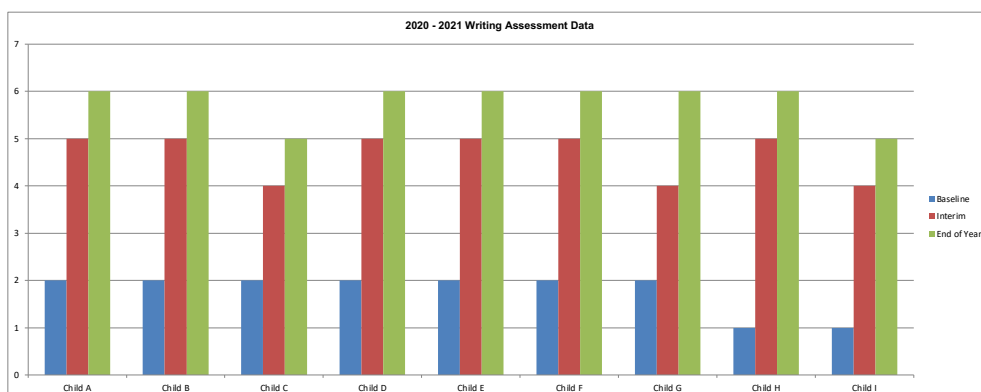


Fig. 3. Writing assessment data

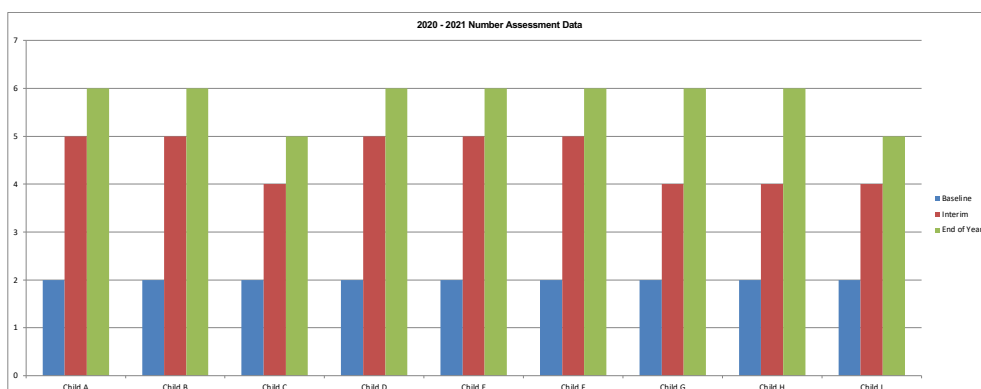


Fig. 4. Number assessment data

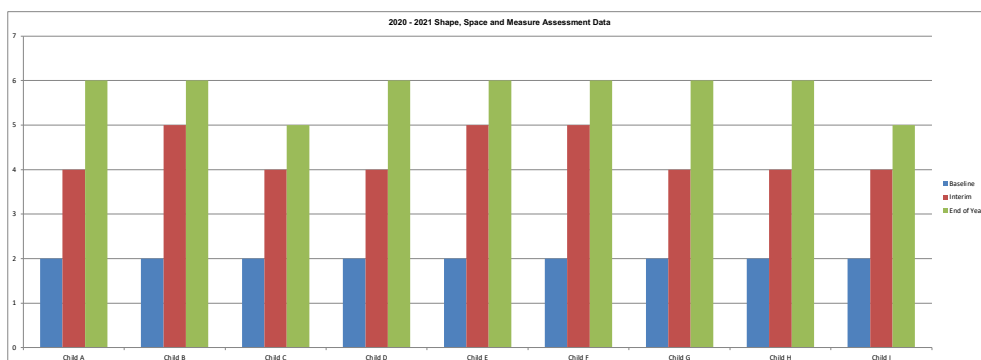


Fig. 5. Shape, space and measure assessment data

As well as literacy and mathematics assessment data collected, children were also surveyed for their views (Figure 6). Children were asked the following: Do you like challenge buckets and why?

<b>Child A</b>	<i>"I like using torches from the bucket to find the coins around the classroom".</i>
<b>Child B</b>	<i>"My mum always says I have to learn more in school, that's why I have to do more activities from the bucket, but I like to play outside".</i>
<b>Child C</b>	<i>"They are fun, but I like weighing buckets in construction area more".</i>
<b>Child D</b>	<i>"I like to be the first to finish the challenge bucket activity so you can give me a sticker".</i>
<b>Child E</b>	<i>"I liked making faces on the pumpkin I found in the bucket".</i>
<b>Child F</b>	<i>"I like fun tasks from the challenge bucket like when we had to do star jumps and describe how we feel after the exercise. I was very tired!"</i>
<b>Child G</b>	<i>"I like playing games from the bucket with my friend and taking pictures on the iPad".</i>
<b>Child H</b>	<i>"My mummy says that I am a very clever girl, that's why I can do writing from the challenge bucket".</i>
<b>Child I</b>	<i>"I think they make me clever".</i>

Fig. 6. Pupil voice

Although some children responded that they like other activities more, all made positive comments regarding quality of the challenge bucket activities.

## Impact and Conclusion

The findings from this research study suggest that the implementation of daily differentiated challenges in the form of challenge buckets for the most able children were successful in developing independence, pupil engagement and ultimately exceeding attainment in the EYFS early learning goals in literacy and maths. Higher attaining children became more engaged in their learning, both during focus groups and free-flow time and developed their independent learning skills due to carefully planned extension activities in the challenge buckets. Furthermore, seven out of the remaining nine children in the research project achieved exceeding judgements.

The findings of the action research project are based on pupil assessment throughout the academic year and the views of the practitioners and children regarding the additional challenge activities. The feedback from practitioners stated that carefully planned differentiated lessons, appropriately pitched focus group activities, that meet every child's needs, as well as carefully planned challenges on the table tops in the form of the challenge buckets helped more able children to become confident with their independent learning and to make better than expected progress.

## References

- Sue Cowley, *The Ultimate Guide to Differentiation: Achieving Excellence for All*, Bloomsbury Publishing (Mar 2018)
- Bruce, Tina (2011) *Learning Through Play: For Babies, Toddlers and Young Children* (Paperback) UK: HODDER EDUCATION
- Early Education (2012) *Development Matters in Early Years Foundation stage*. Accessed at: <https://www.foundationyears.org.uk/files/2012/03/Development-Matters-FINAL-PRINT-AMENDED.pdf>

### Appendix 1 Table top planning prior study, academic year 2019

Literacy	Graphic/Writing Area	<p>LI: I can write the colours of the socks.</p> <p>What colour is Sammy's sock?</p> <p>What is the first sound?</p> <p>How can you use your phonics to write their colour?</p> <p>Ext: How might Sammy feel after he gets his present?</p> <p>sheet with coloured socks and to write colours, key colour words, colouring pencils</p>	<p>LI: I can describe Sammy the Spider.</p> <p>What shape is the spider?</p> <p>How does it move?</p> <p>What colour is it?</p> <p>Ext: How many different movements can spiders do?</p> <p>Describing the spider - sentence starter <b>It is</b></p>
Mathematics	Maths Area	<p>LI: I can add two groups together.</p> <p>How many bugs are in one bottle?</p> <p>How many are there in two bottles?</p> <p>How do you write that number?</p> <p>Ext: How many more bugs are in the bottle number 2 than in the bottle number 1?</p> <p>Clear bottles, bugs, grass, writing element, number lines</p>	<p>LI: I can add two groups together</p> <p>How many teddy's are there in one circle?</p> <p>How many are there altogether?</p> <p>How do you write that number?</p> <p>Ext: If you add two more Teddies, how many will it be altogether?</p> <p>Teddies, circles on laminated paper, number lines, whiteboard pens, recording element</p>

## Appendix 2 Carpet input planning prior study, academic year 2019

Key questions / assessment opportunities AFL / teacher modelling / TP talk / EXT / NEO support	
	<p><b>Literacy</b> LI: I can give meaning to marks I make.</p> <p><b>Maths</b> LI: I can find the total number of items in two groups by counting all of them</p>
Monday	<p><b>LI: I can talk about what I can see on the front cover.</b> Show children the front cover of Sammy Spider. <b>What can you see?</b> TPs Model pointing out the spider and the menorah, counting how many candles you can see. <b>Children feedback.</b> Explain that Hanukkah is a Jewish festival. So far we have learnt about <b>Birthdays, Bonfire</b> and now we are learning about a new <b>festival</b>. Read the story of Sammy the spider. <b>What do you think the Menorah is for? Does it remind you of any other festivals? As a class make a list of similarities. Is there anything that is different? Why do you think Sammy wants to take part in Hanukkah? TPs</b> Explain to children that celebrations are <b>special</b> and that is why everyone wants to be included. Model writing on the board 'Hanukkah is special' taking note of placing, capital letters, finger spaces <b>Ext: What is your favourite celebration and how do you celebrate it with your family?</b> TA to support LA with list of similarities 1:1 following individual timetable.</p> <p><b>OMS: Order numbers to 10</b> <b>LI: I can add two items in two groups together</b> Explain to the class that we will be adding two groups today. Bring up two groups of children. Model counting the children <b>altogether</b>, including silly counting and get the children to correct you. Bring up another two groups of children <b>How many children do we have altogether?</b> Work with children to add the number of children together and <b>children show the number on the number fan.</b> Repeat with different numbers of children <b>Ch to write numbers on wbs</b> TA to support LA with number line. 1:1 following individual timetable. <b>Altogether, add, plus, equals, how many</b></p>

## Appendix 3 Table top planning during the study, academic year 2021

Literacy	Graphic/Writing Area	<p>LI: I can use some clearly identifiable letters to communicate meaning representing them in sequence Where did Old Woman hide from the animals? How will you describe the pumpkin? What sounds can you hear? Describing pumpkin, key vocab, writing template, scaffolds – sound mats, pincer grip examples. Challenge Bucket: Focus: I can write a short sentence. What could you make from a pumpkin? Inside the bucket: fresh slides of pumpkin to promote thinking. Sentence starter: I will make a / key vocabulary soup, a pie, cake, salad, monster etc.</p>	<p>LI: I can use language to recreate the story? What happened in the story? Who are the characters? Can you put the pictures in order? Story sequencing cards, vocab, writing element</p>
Mathematics	Maths Area	<p>LI: I can begin to use the language related to money. What will you buy? How much does it cost? What coin will you choose to pay for your item? Items with prices 1p, 2p, 5, 10p, 20p, coins, shop set up. Challenge Bucket: How many 2p items are hidden around the classroom? What will be the total amount you have to pay for all the items you can find? Remember to count in 2s. Resources: purses with 2p coins, recording sheet with items hidden across the classroom (children have to write the according price), torches, as hidden items are drawn with invisible pens.  </p>	<p>LI: I can identify more and fewer Which basket has more Easter eggs Which has fewer? How many eggs are in the basket that has more? Laminated templates, working sheets, number lines, counters.</p>

## Appendix 4 Carpet input planning during study, academic year 2021

Key questions / assessment opportunities AFL / teacher modelling / TP talk / EXT / NEO support	
	<p><b>Literacy</b> LI: I can use some clearly identifiable letters to communicate meaning representing them in sequence</p>
	<p><b>Maths</b> LI: Beginning to use everyday language related to money.</p>
Monday	<p><b>EMW: LA: Name writing / Holding the pen correctly</b> HA: Writing CVC words to label pictures LI: I can discuss the characters in the story Read the story to the children. Briefly recap what a title, author, front cover, etc. is. After reading, ask the children about the main characters, Who is the main character? Where did old woman go? Why was she thin? Why did she use a stick? How did she escape from the hungry animals? Show children a picture of the pumpkin Where did woman hide? Do you know what might be inside the real pumpkin? Ext: On the white boards children to describe the pumpkin – LA / MA big / round, orange Display key vocab on the IWB.  Ext: HA to describe the pumpkin in full sentences plus using and e.g. It is... and... Scaffolds: phonics mat, phonics frame, key vocabulary on the IWB, sentence starter to write form memory using phonics knowledge TA to support HA with sentence structure (using and) as well as thinking of other adjectives and using phonics to record them. <i>Old woman, bear, wolf, tiger, granddaughter, pumpkin, round, big, orange, seeds, roll</i></p> <p><b>OMS: Uses the language of 'more' and 'fewer' to compare two sets of objects</b> LA: up to 10 objects, HA – up to 20. Resource – printed working sheet. LI: I can begin to use language related to money Tell the children that this week we will be learning about money. Ask children What do we need money for? What can you buy with it? Have you ever helped buy anything in a shop? Choose a few children to share with the class. Look at PPT and explain that this week we will be looking at different coins. Look at pictures What coins do you recognise? How can we tell them apart? Where can you find the number? Which is worth the most? Introduce mathematical vocabulary, penny, pence, pound and symbols we write next to the numbers. Give children coins for 1p, 2p, 5p, 10p, 20p, 50p, 1£ and 2£. Children to find the matching coins from the board and hold them up. Ext: LA/ MA Play the coin reveal game. Can you guess what coin it is?  Ext: HA to buy two toys and give the correct amount of money. T to support LA and SEN with finding the correct coins 1:1 To follow separate timetable TA to sell toys to HA. Prices 1p, 2p, 5p, 10p  <i>Money, coins, penny, pence, pound, price</i></p>

## Appendix 5 Challenge bucket example

