Maths Champions
Additional Appendices
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Independent evaluators:

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The TIDieR (Template for Intervention Description and Replication) Checklist*:

Information to include when describing an intervention and the location of the information

Item number	Item	Where located **	
		Primary paper (page or appendix number)	Other † (details)
	BRIEF NAME		
1.	Provide the name or a phrase that describes the intervention.	1	_____
	WHY		
2.	Describe any rationale, theory, or goal of the elements essential to the intervention.	6, 7 Appendix D	_____
	WHAT		
3.	Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	6, 7 Appendix D	_____
4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	6, 7 Appendix D	_____
	WHO PROVIDED		
5.	For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.	6, 7 Appendix D	_____
	HOW		
6.	Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	6, 7 Appendix D	_____
	WHERE		
7.	Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	6, 7 Appendix D	_____

	WHEN and HOW MUCH		
8.	Describe the number of times the intervention was delivered and over what period of time including the number of sessions, their schedule, and their duration, intensity or dose.	6, 7 Appendix D	_____
	TAILORING		
9.	If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when, and how.	N/A	_____
	MODIFICATIONS		
10.‡	If the intervention was modified during the course of the study, describe the changes (what, why, when, and how).	7	_____
	HOW WELL		
11.	Planned: If intervention adherence or fidelity was assessed, describe how and by whom, and if any strategies were used to maintain or improve fidelity, describe them.	7, 20	_____
12.‡	Actual: If intervention adherence or fidelity was assessed, describe the extent to which the intervention was delivered as planned.	43	_____

** **Authors** - use N/A if an item is not applicable for the intervention being described. **Reviewers** – use '?' if information about the element is not reported/not sufficiently reported.

† If the information is not provided in the primary paper, give details of where this information is available. This may include locations such as a published protocol or other published papers (provide citation details) or a website (provide the URL).

‡ If completing the TIDieR checklist for a protocol, these items are not relevant to the protocol and cannot be described until the study is complete.

* We strongly recommend using this checklist in conjunction with the TIDieR guide (see *BMJ* 2014;348:g1687) which contains an explanation and elaboration for each item.

* The focus of TIDieR is on reporting details of the intervention elements (and where relevant, comparison elements) of a study. Other elements and methodological features of studies are covered by other reporting statements and checklists and have not been duplicated as part of the TIDieR checklist. When a **randomised trial** is being reported, the TIDieR checklist should be used in conjunction with the CONSORT statement (see www.consort-statement.org) as an extension of **Item 5 of the CONSORT 2010 Statement.** When a **clinical trial protocol** is being reported, the TIDieR checklist should be used in conjunction with the SPIRIT statement as an extension of **Item 11 of the SPIRIT 2013 Statement** (see www.spirit-statement.org). For alternate study designs, TIDieR can be used in conjunction with the appropriate checklist for that study design (see www.equator-network.org).

Theory of change: Maths Champions Intervention

Brief introduction to Theory of change

A well articulated theory of change has been seen as an effective way to an intervention's success as it allows the programme developers to describe in detail the rationale behind the development of their intervention, the theoretical framework that underpins their work, and to identify the potential causal links that might be bringing change to the agreed outcomes as a result. Such a document can be used at different phases of an intervention with the necessary amendments: at the strategic development; at the implementation of the intervention and at the programme's evaluation. When comparing a theory of change for strategy and that for evaluation there is an expected change of focus. The table below allows the reader to see that a different structure would be needed when writing these two. The current document will be written based on the aims of change for strategy in the hope that it will support the evaluation team as much as possible in having a clear understanding of the intervention under focus. It will address also the implementation characteristics of the programme as this is important for the holistic representation of the model used.

Theory of change for strategy	**Theory of change for evaluation**
Focusing on the goal	Understanding all your outcomes
Showing the causal links	Making sure that outcomes are realistic
Revealing hidden assumptions	Understanding how outcomes are connected
Basing the strategy on evidence	Understanding progress towards the final goal
Using the views of stakeholders	

Table 1: Theory of change for strategy and evaluation based on information from Kail & Lumley (2012)

Kail and Lumley (2012) stated that:

> *A theory of change shows a charity's path from needs to activities to outcomes to impact. It describes the change you want to make and the steps involved in making that change happen. Theories of change also depict the assumptions that lie behind your reasoning, and where possible, these assumptions are backed up by evidence* (p. 3)
>
> .

Structure of this document

The following document attempts to articulate, as close as possible, a theory of change model that underpins the Maths Champions (MCs) Intervention programme as offered by the National Day Nursery Association (NDNA). The document has four sections.

The first one will provide a brief description of the actual intervention programme focusing on a) the individual components of the intervention; b) the models of delivery and c) the intended outcomes of the intervention for both adults and children, and potentially for the quality of the classroom environment.

The second section will address briefly what we know from theory and empirical research studies about the different components of professional development, focusing specifically on those employed by MCs.

The third section will address briefly what we know from theory and previous research on children's early mathematical development.

Finally, the last section will describe in detail the logic model of MCs as agreed with EEF and explain why NDNA has put in place this particular model and what is expected to change.

Section 1: A brief description of the intervention Maths Champions

The National Day Nursery Association (NDNA) have a vision "For all children and families to flourish through excellent early years care and learning" and a mission "To lead and empower the sector so that nurseries and the early years workforce deliver sustainable, high quality care and learning" (NDNA, personal communication, Feb 2016).

Maths Champions was developed in response to the continuing need for support of the early years workforce both in their content knowledge of subject teaching as well as in the teaching strategies they can employ. Many early years professionals working in diverse settings lack training, especially in mathematics, or they do not feel confident about their own mathematical skills. Maths Champions was initiated to address:

i. The confidence and knowledge of practitioners who need to 'teach' mathematics in early years settings
ii. And, as a subsequent outcome, to develop young children's engagement and knowledge of mathematical skills

In order to achieve these two broad goals NDNA enlists interested graduates in early years settings to be supported in order to empower their own teams in the settings when working with maths.

The Maths Champions programme itself, and all associated resources, are based online. The programme within each nursery is designed to be led by the graduate within the setting, with a team of practitioners; in particular those who work with children aged 3-4 years old.

The programme starts with two online courses to support the setting's graduate in becoming a 'Maths Champion'. These courses aim to help the Maths Champion evaluate their practice and measure the impact in all they do, and also give them the skills to mentor and lead the team in the programme. Each course will take around two hours but can be completed in short sections.

The Maths Champion will then work with their own team to evaluate the nursery's current practice, using audit tools provided, including providing details of their own and the nurseries three year olds' maths skills. At this stage, practitioners are also asked to complete a short questionnaire to rate their confidence in maths. This information helps the NDNA to create a tailored programme to support each setting.

From this point, the programme is made up of three main components:

(1) The award winning BKSB skills assessment tools which aims to help the team in each setting to improve their own personal maths skills with 1-1 support from the setting's Champion (taking around 10-15 minutes per month).
(2) Three online courses throughout the year for the Maths Champion to gain information to pass onto practitioners.
(3) An online resource bank providing maths ideas to build into the nursery's daily practice. These resources are reinforced by short monthly webinars available for the participating setting's Maths Champions team to take part in and view with focused themes to help the team implement maths into their continuous provision and every day practice.

Throughout the programmes the Maths Champion also receive tailored 1-1 support from NDNA.

Towards the end of the programme, the team in each setting is asked to revisit initial audits to assess any changes in the setting as well as any improvement in the children and staffs own maths skills.

Section 2: Short review of evidence on professional development

Skills of early years professionals

For the context of the current study an Early Years Educator shall be used to refer to anyone (qualified or not) who works with children in settings providing early childhood education. An early years teacher and early years professional are accepted to be graduate roles (with either Qualified Teacher Status (QTS) or Early Years Professional Status (EYPS) respectively) (Nutbrown, 2012).

It is well known that the training of early years professionals in England leaves a lot to be desired. We know however from research evidence that a number of factors can influence the quality of provision in early years setting and the children's experiences and learning.

Influences on the quality of early years provision

Many factors have been identified as influencing the quality of provision that EY settings are able to deliver. These factors act at different levels of the organisation; the setting level characteristics; the classroom level characteristics and, most importantly for the needs of this study, the staff level characteristics. Holbrooke summarised these by providing research evidence in her doctoral thesis (work in progress, 2015):

Setting-Level Characteristics

One of the most frequently identified setting-level characteristics is the sector of the providers, with the maintained sector consistently identified as offering higher quality than the private, voluntary and independent sector (Hansen, 2012; Mathers et al, 2007). This supports the current focus of the Maths Champions programme on the PVI sector.

The introduction of the Early Years Foundation Stage (EYFS) in 2008 was intended to improve consistency and was the first time settings from all sectors were required to meet the same minimum standards.

Classroom-Level Characteristics

The second most important influence on overall quality (after sector) has been identified as the group size, with larger groups being of higher quality (Mathers et al., 2007). However, elsewhere, from an analysis of case studies, Sylva et al. (2004) identify the 'quality of adult-child verbal interactions' (p. vi) as one of six practices that are particularly important for pre-school-aged children. This evidence suggests that in settings with a lower child-to-adult ratio, where each child may engage in more verbal interactions with adults, the overall quality may be higher. This is important for the Maths Champions programme as it aims, amongst other things, to enhance quality of interactions.

Staff-Level Characteristics

Historically the early years workforce has endured low status and poor pay. The levels of qualification and experience have traditionally been diverse, and until recently the majority of staff have been qualified at level-3 or below. The Maths Champions programme targets graduates to utilise research evidence. International research has shown that, outside of inter sector differences, child-to-adult ratios and levels of staff qualification are two of the best predictors of the overall measured quality of a setting (Mathers & Sylva, 2007; Phillips et al., 2000). In England a recent Independent Review (Tickell, 2011) identified a qualified workforce as essential for raising the quality of early years education and closing the achievement gap caused by disadvantage. Nutbrown (2012) added weight to this argument by reporting that level-2 childcare qualifications do not require sufficient skills for working in the early years sector at all. There is substantial evidence that quality is positively correlated with child outcomes and also with higher levels of staff qualification, in particular the presence of a graduate (Siraj-Blatchford, Taggart, Sylva, Sammons, & Melhuish, 2008) in the setting. (Holbrooke, 2015, doctoral thesis, work in progress).

One of the suggestions of the EYFS review by Evangelou et al (2009) was to promote a skilled workforce through professional training; the review emphasised:

> The importance of effective practitioner staff development in recognising and responding to situations where the six domains of development (including the use of ICT) can be enhanced 'on the spot' (Evangelou et al. 2009, p.81).

Characteristics of effective professional development: content and strategies

Content of professional development

Effective professional development shares a core set of characteristics according to Desimone (2009); content focus; active learning; coherence; sustained duration and collective participation (p. 468). In this document, the characteristics of active learning and collective participation will be considered as a strategy of professional development employed by the Maths Champions programme. The current evaluation study, which utilises a RCT will offer rigorous evidence and will test experimentally the importance of all the components of the professional development as a package. We will still need to know how practitioners vary in their participation to the programme.

Desimone (2009) puts forward a number of important questions; when and if the programme is implemented well, does the new content or pedagogy learned in professional development improve student learning? (p.468). In the case of Maths Champion, student learning can be seen both as the learning of the professional, as they aim to enhance their own mathematical skills, as well as that of the children. A second question (ibid) posited is how well do the professional development activities elicit improvements in teacher knowledge and instruction? Will the model of change work for all participating professionals or for those who showed higher implementation fidelity?

Content employed for professional development by the Maths Champions programme

Content

Maths Champions is a content focused intervention and this can be seen through three components: firstly, the 'train the trainer' course, which provides new skills in supporting the Champion's teams through coaching and mentoring. The second component is through offering training to Maths Champion on how to evaluate their practice and how to measure impact. They do this by teaching the Champions methods for looking at what they currently do, how to improve this, and measure the impact, backed up with the use of practical exercises (audit tools) so they can see this in practice.

Champions and members of staff all have access to online training materials on what maths is and the different methods of teaching this subject matter. This includes information about the different stages of mathematical development of children and their trajectories. They also receive support through the resource bank with ideas and methods for teaching children how to develop number sense and understanding of shapes, space and measure; these are additionally backed up with themed webinars.

Coherence

All the elements of the programme on offer are backed up with 1-1 support from NDNA and monthly themed webinars that address both practice and the continuous professional development of practitioners. There is clear coherence throughout the programme. This starts with setting the scene and evaluating their practice which leads into the audit tool completion. This in turn is followed by support for individual settings which is based on them using the resources available in the resource bank, backed up with the individual training courses for the practitioners on the overall maths subject and individual "number" and "shape, space and measure" aspects of the EYFS.

There is also evidence of clear coherence in the staff skill development aspect of the programme when they are using the BKSB – initial skills assessment. They do so by supporting practitioners to understand why this is essential, followed up with individualised skill development that goes hand in hand with 1-1 support from their Champions in their supervisions.

Sustained duration

There is evidence of clear sustained duration throughout the year of the programme; as well defined and time bound steps are put in place to ensure that practitioners get the most out of the programme. These include the introduction section of initial training and self-evaluation of starting position, the middle section of the intervention, the teaching and support of using all the resources / training / webinars etc, and the final section of re-evaluating and future planning.

The majority of the programme takes place with the children in their daily work and practice, this enables the setting to participate more actively and sustain their involvement as this is just their 'normal' role within the setting. All elements of the programme are backed up with 1-1 support from NDNA and monthly themed webinars supporting both practice and own CPD.

Strategies employed for professional development by the Maths Champions programme

A number of promising approaches to support professional development in diverse early years settings have been reviewed by Powell, Diamond and Cockburn (2014). As there is a current emphasis on supporting professionals within their daily practices their review delineated diverse models and strategies and of course their potential effectiveness on PD. The strategies reviewed are the creation of Professional Learning Communities, Coaching and the use of Technological Innovations. In addition, the strategies of collective participation and active learning will be discussed in this document. Powell, Diamond and Cockburn (2014) completed their review by addressing the topic of variation in PD implementation and engagement. Having reviewed their paper it becomes evident that Maths Champions uses many strategies to implement their programme and to enhance professionals' confidence and knowledge in mathematics, as well as to drive children's outcomes.

The creation of Professional Learning Communities

Vescio, Ross and Adams (2008) posited that:

> *a professional learning community in the field of education typically consists of a small group of educators and other stakeholders who meet regularly to work collaboratively on instructional or curriculum changes aimed at improving student learning (p. 386).*

The Maths Champions programme capitalises this idea of the creation of a learning community by training a graduate and by facilitating the collaborative work within settings of the practitioners. Although research on the effectiveness of the Professional Learning Communities as a model of delivery is limited there are studies that show positive effects on teachers' knowledge of vocabulary instruction. By using such a model for the implementation, Maths Champions aim to create a knowledge base of best practice and to develop the experiences of the professionals in a non-threatening environment.

Collective participation The Maths Champion is advised to work with all or key members of their team to improve their practice using the resources and information provided by NDNA. NDNA are also actively involved in the setting using the regular contact, data and information provided by the setting, or by visiting the setting (in some cases) and working alongside the Champion and practitioners in supporting their development. Maths Champions are encouraged to share their practice with the other Champions via the Facebook page and resource bank; giving them the platform to be more actively involved in the intervention by supporting each other. This is also reflected in the webinars where they can share ideas and challenges and discuss how to overcome these.

Active learning

The Maths Champion programme uses interactive and constructive feedback throughout. This is offered from the NDNA to the Champions in 1-1 support, and from the Champions to their practitioners in the supervision sessions. The availability of a Facebook page allows both Champions and practitioners to share experiences. Champions can also use the ideas discussed in staff meetings or webinars internally to support whole staff training. They can use the observations of practice in supervisions to focus on the programme and their own individual maths development. In addition, they can use the evaluation of activity boxes on the activity idea sheets to assess how well the teaching or activity went and how to extend this further or develop the teaching method to adapt to children's needs

Coaching

Coaching is another strategy that Maths Champions is using to support the professionals participating in their intervention programme. This is implemented when the work is offered directly to practitioners or a team and it becomes highly individualised to meet their needs. This is the role of the graduate who has additional support from Maths Champions to work with their team.

Technological Innovations

A final strategy reviewed in the paper by Powell, Diamond and Cockburn (2014) is the use of technological innovations. Maths Champions capitalise on this as the majority of the ongoing support is online or via webinars and the materials are all available online. This allows the practitioners to work with the material at their own pace. Maths Champions has created a web-based forum that allows practitioners to share material and information as well as to upload their own resources and ideas. Although webcams are not used in classroom settings to observe how practitioners are implementing the Maths Champions material; this is a possibility for tailored individual feedback.

What Maths Champions do not know, but the current evaluation will afford them to understand, is the level of implementation fidelity to the programme, something that cannot be underestimated especially when an intervention is reaching so many settings and professionals as MCs does.

Additional strategies used by NDNA and acknowledged in the literature are the following: needs assessment of the participants; ongoing support from NDNA; opportunities for participants to engage in active learning; and in-class mentoring; activities that are integrated in the daily curriculum;, sustained collaboration with opportunities for follow-up; differentiated coaching to address the individuals needs of graduates and of each practitioner. There is clear collegiality between professionals, graduates and the administrators of the intervention programme.

SECTION 3: Short review on evidence re children's mathematical development

> *Children must be supported in developing their understanding of Problem Solving, Reasoning and Numeracy in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. They must be provided with opportunities to practise and extend their skills in these areas and to gain confidence and competence in their use*. EYFS, p.61 http://www.standards.dfes.gov.uk/eyfs/resources/downloads/card4_7.pdf

Mathematics is one of the specific areas of development according to the Statutory Framework for the Early Years Foundation Stage. It involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures.

In particular it details the aims for numbers and shape, space and measures as follows:

Numbers:
Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single - digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Shape, space and measures:
Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore 12 characteristics of everyday objects and shapes and use mathematical language to describe them. http://www.foundationyears.org.uk/files/2014/07/EYFS_framework_from_1_September_2014__with_clarification_note.pdf (Accessed 09/02/2016).

A review of the research evidence on children's development was written in 2009 by Evangelou, Sylva, Wild, Glenny and Kyriacou; its aim was to consider the original sources as well as their critical reviews and to feed back to the EYFS review team. The information below summarises the section written by Dr Alison Price from the Review (Evangelou et al, 2009, pp 35-39) on problem solving, reasoning and numeracy.

Recognising number ('Numerosity')

Wynn's (1998) research into babies' understanding of numerosity demonstrated that children in their first year of life are sensitive to number, able to recognise 'how many' without counting (known as subitization) and recognise the difference between sets of objects and even reason about changes in numerosity. While there has been research confirming Wynn's findings (Feigenson, 2004; Chen, 2009), others have challenged the suggestion of an innate verbal counting mechanism (LeCorre & Carey, 2007), which may be based on spatial representation rather than a pre-counting (Lecuyer, 2004) and counting. Cappelletti et al. (2007, see also Halberda & Feigenson, 2008) therefore propose two levels of evolution of numerosity: '*the biological evolution of elementary, non-symbolic numerical abilities*' and '*the cultural evolution of higher level symbolic mathematics*' which includes counting and calculation (p.74). Baroody et al. (2006, p.196) suggest that toddlers 'may benefit from seeing a variety of examples and non-examples of the intuitive numbers' (1- 3), and from encounter with quantities arranged to form different recognisable number patterns. Research indicates both starting from the child in terms of offering meaning and language for small number in subitization contexts and also the cultural necessity to teach counting (Benoit et al., 2004), cardinality and ordinality (Rips et al., 2006).

Counting, cardinality and one to one correspondence

The key principles of counting identified by Gelman and Gallistel in 1978 still form the core understanding of children's counting development. However recent research highlights two aspects of counting which may need attention in early years setting. The first is the 1:1 principle of counting notes the matching of one number word to each object. However, as Thompson (2008) and others have noted there is little or no evidence of transfer from object to object matching to object to word matching. The idea that number words and written symbols (Rogers, 2008; Lipton & Spelke, 2006) represent quantity rather than being a function of counting and the relationship between consecutive counting numbers as representing one more or one fewer (Sarnecka & Carey, 2008) could have greater emphasis in the early years curriculum. Rather than focussing on matching sets of objects by 1:1 correspondence, more could be made of recognising equivalence, greater than and less than when comparing sets (Sophian, 2007) to encourage logico-mathematical reasoning (Nunes, 2007). The second relevant aspect of counting relates to the cardinal principle, in that the count word assigned to the final object indicates the cardinality (how many) of the whole set.

Calculation

Calculation builds on and draws upon early understanding of number and counting (Baroody et al., 2006). Understanding of calculation appears to be developed in two ways – one based on the innate understanding of number and the other on counting. This early understanding needs to be related to the use of counting to solve calculation problems in the real world rather than just counting objects 'because they are there' (Muldoon et al., 2005). More could be done in the early years to develop knowledge of the counting words, forwards, backwards and from a given number other than one, in order to aid subsequent calculation strategies.

Shape, space and measures

Understanding of the concept of shape seems to be, if not innate, then learned very early. From birth babies seem to be able to distinguish between open and closed geometric shape (Turati et al., 2003), three month old babies can be shown to already distinguish between different three dimensional shapes (Poirer et al., 2000) and babies at around five months can be taught to identify the irregular angle in an isosceles triangle (Lourenco, 2008). Similarly, Shusterman et al. (2008) found children able to use ideas of angle and distance to solve mapping problems.

The role of language in mathematic learning

Children in foundation settings can be seen to use a range of mathematical language during play (Coltman, 2006). Story books also offer a context for mathematical discussion (Anderson et al., 2004; Casey & Young, 2004; Van den Heuvel-Panhuizen, 2008). However, Diaz (2008) found that early years practitioners were often unresponsive to the range of mathematic utterances during block play indicating the need for staff development in recognising and responding to mathematics in play situations (see also Morton, 2003).

Pedagogy

Research into children's cognitive development should not, however, dictate curriculum and pedagogy which could become over formalised. Aubrey (2003) reports on a European study which shows that beginning formal instruction at an early age does not improve subsequent mathematical achievement. However, appropriate provision is beneficial as shown by the EPPE project in England (Sammons et al., 2004) and in the Big Math for Little Kids project in the United States (Greenes et al., 2004; Ginsburg, 2006).

In a review of pedagogy for mathematics in the early years Gifford (2004, p.99) argues for a pedagogy:

> '*considering children's mathematical learning in terms of cognitive, physical, social and emotional aspects. A range of cognitive processes, an emphasis on large-scale activity, and multisensory learning, concerns for children's self esteem and agency in their own learning, diverse home experiences and supported pair and group situations*'.

The review reported a number of implications for early years practice with regards to the content of teaching mathematics in early years and the need for effective professional development. As these are directly relevant to the Maths Champions programme they are summarised below.

- The importance of problem solving in social context as the medium for mathematics learning in the early years over more formal mathematical tasks;
- The use of picture books as a context for problem solving and using mathematical language;
- Delaying formal mathematics, especially operating with symbols until children have appropriate conceptual development of number and number operations;
- The use of gesture in counting and cardinality.
- The importance of effective practitioner staff development in recognising and responding to mathematical situations and language when they arise.

What is teaching mathematics in early years?

Ginsburg and Amit (2008) posited the need for early childhood mathematics education to become more prominent and to be implemented on a wider scale. This view is also expressed by the National Association for the Education of Young Children and of the National Council of Teachers of Mathematics, who confirmed that "…high-quality, challenging, and accessible mathematics education for 3- to 6-year-old children is a vital foundation for future mathematics learning. In every early childhood setting, children should experience effective, research-based curriculum and teaching practices" (National Association for the Education of Young Children and National Council of Teachers of Mathematics, 2002, p. 1). They summarised in their paper that:

> *... although young children's thought is different from adults, they deal with mathematical ideas in everyday pay, are curious about the subject, know something about it, and can learn interesting mathematics when they are taught. .... Before formal schooling young children deal spontaneously and sometimes joyfully with mathematical ideas. These are the facts that early childhood teaching must recognise and take into account (p. 275)*

In their paper they showcased through one case study of a very able early years mathematics teacher *that teaching mathematics to young children is as complex as teaching to older children. All age levels [including the very young children] should be engaged in learning abstract mathematics. And relevant to MCs that the system of training early years professionals need to teach them mathematics in complex ways and to be helped to teach effectively (p. 284).*

The need for early years mathematics interventions

The Quality of Childcare Settings in the Millennium Cohort Study (QCSMCS) was established to assess the quality of provision attended by a sample of the 10,000 Millennium children living in England. It aimed to explore the quality of the group childcare settings. It was found that the provision of Maths and Science was the weakest with mean scores of 3.2, just above the minimal scores, across the sample (Mathers, Sylva and Joshi, 2007). This gives evidence to support the need for tailored early childhood mathematics interventions.

A review of such interventions was written in 2011 by Clements and Sarama; they recognised that:

> *Preschool and primary grade children have the capacity to learn substantial mathematics, but many children lack opportunities to do so. Too many children not only start behind their more advantaged peers, but also begin a negative trajectory in mathematics. Interventions designed to facilitate their mathematical learning during ages 3 to 5 years have a strong positive effect on these children's lives for many years thereafter (page 1).*

While acknowledging children's capacity they did not omit to acknowledge the poor skills of early years professionals and their misinformed view of what supporting children's mathematics is and how it can be achieved.

> *Early childhood teachers often believe they are "doing mathematics" when they provide puzzles, blocks, and songs. Even when they teach mathematics, that content is usually not the main focus, but is embedded in a fine-motor or reading activity. Unfortunately, evidence suggests that such an approach is ineffective, owing to a lack of explicit attention to mathematical concepts and procedures along with a lack of intentionality to engage in mathematical practices (page 1).*

They concluded that evidence supports interventions that provide foundational and mathematical experiences in number, space, geometry, measurement, and the processes of mathematical thinking, giving thus space for interventions as Maths Champions develops further.

SECTION 4: Detailed description of the logic model

Figure 1 describes the logic model as agreed between NDNA, EEF and the universities of Oxford who are supporting the intervention and the Universities of Durham and York who are carrying out the evaluation the intervention. The W.K. Kellogg Foundation (2004, p.3) described five steps in the development of a logic model addressing: the resources or inputs, the activities, the outputs, the outcomes and the potential impacts (p.3).

1. Factors / Resources or inputs are resources and/or barriers, which potentially enable or limit program effectiveness. Enabling *protective factors* or *resources* may include funding, existing organizations, potential collaborating partners, existing organizational or interpersonal networks, staff and volunteers, time, facilities, equipment, and supplies. Limiting *risk factors* or *barriers* might include such things as attitudes, lack of resources, policies, laws, regulations, and geography (W.K. Kellogg Foundation, 2004, p.3).

What is Maths Champions as an intervention programme trying to improve?

The intervention is trying to develop the teaching of mathematics while influencing four areas: the Maths Champions, the practitioners, the children and the offer of quality teaching in the participating settings. In particular:

For the Maths Champions

- To increase accessibility to CPD for a deeper knowledge of the importance of maths in early years
- To develop Champions' skills in teaching adults.
- To identify skills gaps and facilitate development in Maths to enable them to teach others.
- To enhance the ability for champions to understand the importance and to become able to self evaluate and measure impact within their own setting.
- To offer Champions a deeper understanding of developing children's everyday maths experiences based on early years theorists and research evidence

For the practitioners

- To increase accessibility to CPD for a deeper knowledge of the importance of maths in early years and to enable equal participation for nursery practitioners. The extension of this programme with EEF is to specifically focus on children based in the high deprivation areas of England.
- To identify practitioners skills gaps and facilitate development in Maths

- To develop practitioners' confidence to teach children maths; and for those who wish to, to progress and advance to further education. To offer practitioners a deeper understanding of developing children's everyday maths experiences based on early years theorists and research evidence. To offer a basic knowledge of what maths is and why it is important to learn maths from an early age. How this learning relates to preschool.
- To develop practitioners confidence in early years settings, in a non threatening environment.
- To ease access to personal development material to enable practitioners to quickly access high quality resources.

For the children

- To develop confidence in working with mathematics though everyday practice. To develop a holistic approach to raising opportunities and outcomes for children.
- To provide high quality resources to ensure that children have opportunities to develop maths skills within everyday play.

For the early years settings

- To improve the environment, the resources available, the teaching practice and how parents are involved in children's maths through play.
- To see the outdoor environment as a mean to facilitate children's maths development; and to integrate maths into daily play.

2. ***Activities*** are the processes, techniques, tools, events, technology, and actions of the planned program. These may include *products* – promotional materials and educational curricula; *services* – education and training, counselling, or health screening; and *infrastructure* – structure, relationships, and capacity used to bring about the desired results (W.K. Kellogg Foundation, 2004, p.3). As these are described earlier on page 2, it is important to note factors that might influence the impact or factors that mitigate the risks for a non-successful implementation.

Factors that might influence the impact

- Access to the internet, equipment and time within the setting to be able to maximise their opportunity to learning.
- Practitioners' skills in IT to enable access to webinars etc.
- The inability for the champion to break down fears of maths with practitioners
- Champions reluctance to complete diagnostic pre and post programme
- Practitioners not realising benefit of evaluation and impact course.
- Improvements in children's progress not demonstrated
- Disengaged practitioners from the programme
- An inability to develop the settings practice
- Lack of confidence in maths as a whole, impacting on children's opportunities with the setting
- Lack of confidence in applying learning
- No distance travelled for children's development

Risk mitigation

- 1 - 1 NDNA telephone helpdesk for IT issues, short tutorials on how to access various resources, BKSB help desk and video tutorials
- 1 - 1 call included the need to integrate this programme into Supervisions.
- 1 - 1 support to develop confidences and allay fears.
- Clarity in induction of programme. 1 - 1 remote support and those at risk 1 -1 setting visits

3. ***Outputs*** are the *direct results* of program activities. They are usually described in terms of the *size and/or scope of the services and products delivered or produced* by the program. They indicate if a program was delivered to the intended audiences at the intended "dose." A program output, for example, might be the *number* of classes taught, meetings held, or materials produced and distributed; program *participation rates* and demography; or *hours of each type of service* provided (W.K. Kellogg Foundation, 2004, p.3).

Recruitment to the programme

As can be seen from Figure 1 NDNA recruits and nurseries and identifies the Maths Champions within each as well as up to 6 practitioners that are willing and interested to participate in the programme.

Implementation

This is followed by input from the NDNA on 3 different aspects: firstly by training the trainers, secondly by doing a setting's audit of current teaching practices and children's level of attainment, and thirdly by agreeing an action plan within each participating setting.

At the same period of time, the practitioners are filling in a self-assessment form and an action plan is agreed. There is continuous support of the MCs including a review of their action plans and any progress made. The MCs and the practitioners in this phase have access to online material and to webinars. They also carry out a BKSB training that is linked to their knowledge of mathematics.

Evaluation

While the programme is implemented the evaluation team will explore the process of the programme implementation. This will take place via a number of interviews and surveys which will be carried out by the evaluation team. The survey will aim to capture two different things: the first is the levels of knowledge and confidence in teaching mathematics of both the MCs and the practitioners and the second is to gauge their own maths confidence and knowledge.

In addition, the quality of teaching and how the learning environment may change will be captured by the use of the ECERS 3 and the mathematics component of ECERS-E. These structured observations will provide evidence to whether the quality of adult-child interaction is also improving.

4. ***Outcomes*** are specific *changes in attitudes, behaviours; knowledge, skills, status, or level of functioning* expected to result from program activities and which are most often expressed *at an individual level* (W.K. Kellogg Foundation, 2004, p.3).

The intended outcomes are children's mathematical skills and knowledge as a direct result of work with their early years educators in the areas of number, shape, space, time and problem solving. Children's maths attainment will be linked to the National Pupil Database (NPD) to allow longitudinal tracking of their progress in mathematics.

5. ***Impact****s* are *organizational, community, and/or system level changes* expected to result from program activities, which might include improved conditions, increased capacity, and/or changes in the policy arena (W.K. Kellogg Foundation, 2004, p.3).

The impact of the intervention, if the evaluation deemed successful will be twofold: a) in the area of Professional Development of early years educators as a model of delivery will be tried and tested with a large sample. In addition, there is potential impact on the confidence of the participants in their personal knowledge and skills in mathematics and in their skills and knowledge of teaching mathematics to young children. The second area of potential impact is on children's outcomes as the results may show that MCs is an effective intervention that drives children's developmental trajectories. If successful the programme can be rolled out in early years settings

In particular the following impact is anticipated for Champions, practitioners and children:

For the Maths Champions

- More likely to access learning provision within a flexible delivery model and an opportunity to practice knowledge acquisition in the workplace
- Champions weaknesses identified and improvements demonstrated as a result of personal development plans.
- Champions increase confidence levels as a result of the entire intervention
- Champions able to effectively self evaluate practice and impact as a result of learning intervention.

- Accurate judgements made on settings offer opportunities for development tailored to their needs. Effective evaluations include all parties in the setting to enable all views to be seen and taken on board
- Champions have the skills to support practitioners in the workplace though a sound understanding of learning styles and preferences
- Champions have a grounded understanding of how children learn and how to deliver effective maths learning strategies in a nursery environment.

For the Practitioners

- Practitioners are able to see distance travelled and an improvement of the delivery of maths through play as a result of the intervention
- Results of own personal assessment via a range of interventions identifies areas for improvement.
- Champions' plans enable them to be confident in providing richer experiences for maths in the nursery and support practitioners to do the same
- Practitioners increase confidence levels as a result of the entire intervention and are encouraged to progress further to formal education
- An ability and confidence to deliver effective maths activities for children using play as a medium
- Results of own personal assessment via a range of interventions identifies areas for improvement.

For the Children

- Children embrace everyday maths with confidence. Environments and daily play activities facilitate maths that help children progress and exceed expected learning milestones.
- Children assessed as exceeding early learning goals in Number and Shape, Space and Measure through the delivery of age appropriate resources and effective adult child interaction and intervention.
- Children make improved progress in maths.

For the Practice

- Identification of areas requiring improvement, changes made to practice and environment, improved intervention and experiences for children.

It is hoped that this document describes the Maths Champions intervention programme in sufficient detail to support its further implementation and its imminent evaluation.

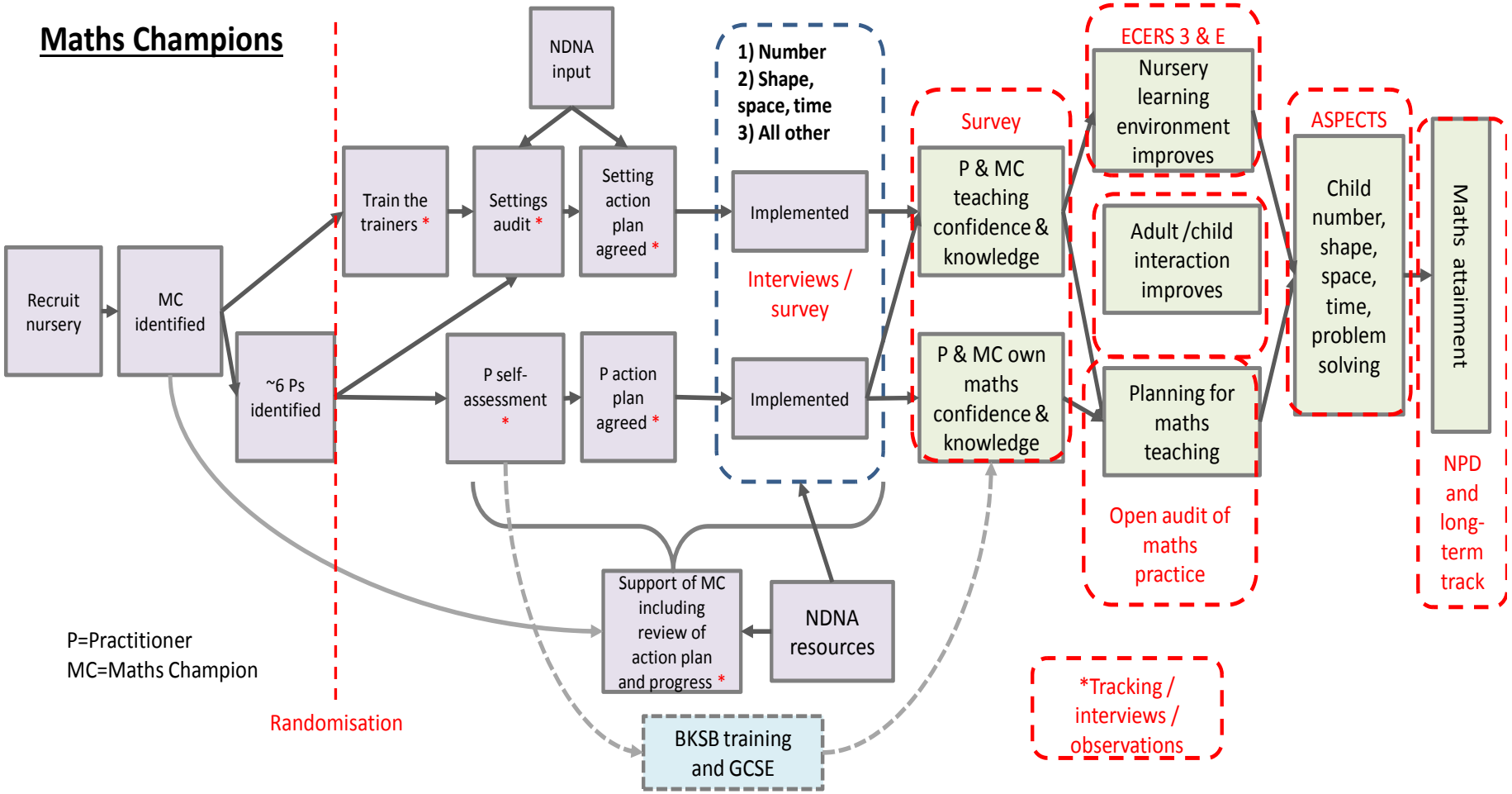

Figure 1: Maths Champions Logic Model: As designed by EEF

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MATHS CHAMPIONS EVALUATION

MATHS CHAMPION SURVEY

We would like to learn more about your experience of the Maths Champions programme. The information you provide will help us to develop a survey to evaluate Maths Champions in a large research project. Completing the survey should take no longer than 15 minutes.

Completing the survey is voluntary and you can leave any questions you do not wish to answer blank. This survey is at a pilot stage and we appreciate any feedback you can give us about any of the questions especially if any questions are unclear.

TRAINING, CONTENT AND SUPPORT

1. How useful did you find the following aspects of the Maths Champions programme? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
E-safety training					
Initial settings audits					
Staff confidence audit					
BKSB initial assessment					
BKSB activities					
Online training courses					
Monthly webinars					
Resource bank					
NDNA setting-specific support					

2. How useful did you find the following training courses? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
Train the Trainer *(to help you understand how to get the best out of your team's training, mentoring and coaching*)					
Evaluating your Practice and Impact Measurement *(to help you to evaluate your practice, action changes and measure the impact)*					
Maths in the Early Years *(to help you to understand what maths is, how brain development supports this and how to plan for maths)*					
Let's Look at Number *(focusing on the aspect of number through the different age groups in your setting – separated out into principles of the EYFS)*					
Let's Look at Shape, Space and Measure *(focusing on the aspect of shape, space and measure through the different age groups in your setting – separated out into principles of the EYFS)*					

3. Do you think that the Maths Champions activities from the resource bank were appropriately pitched for use with children aged 3-4 years old? (Please circle one)

Completely appropriate *Mostly appropriate* *Somewhat appropriate* *Not at all appropriate*

4. Were the Maths Champions materials easy for you to understand? (Please circle one)

Yes, all of them *Most of them* *Some of them* *None of them*

5. What additional support or resources would have been helpful to you, if any? (Please describe)

6a. How many hours did you spend per week doing your own personal development for the initial set-up of the Maths Champions programme?

☐ hours

6b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

7a. After the initial set-up of the Maths Champions programme, how many hours did you spend per week doing your own personal development for the programme?

☐ hours

7b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

8. During the initial set-up of the Maths Champions programme in your setting, how often were you able to provide support to your Maths Champions team? (Please circle one)

At least once a week *2 to 3 times a month* *Once a month* *Less than once a month*

Please give details of what this support was:

9. After the initial set-up of the Maths Champions programme, how often were you able to provide support to your Maths Champions team? (Please circle one)

At least once a week *2 to 3 times a month* *Once a month* *Less than once a month*

Please give details of what this support was:

MATHS CHAMPIONS PROGRAMME IN YOUR SETTING

10. Did you use the Maths Champions programme for the full year? (Please circle one)

Yes No

If no, please write how many weeks or months you used the programme for:

---

11. How engaged were your team at the start of the Maths Champions programme? (Please circle one)

Very engaged *Quite engaged* *Engaged for some parts* *Not at all engaged*

Please give more detail explaining your answer:

---

12. How engaged were your team throughout the Maths Champions programme? (Please circle one)

Very engaged *Quite engaged* *Engaged for some parts* *Not at all engaged*

Please give more detail explaining your answer:

---

13. What were the challenges/barriers, if any, to using the Maths Champions programme within your nursery setting? (Please explain)

POTENTIAL IMPACT OF THE PROGRAMME

14a. What impact, if any, do you think the Maths Champions programme has had on children's development in your nursery? (Please describe)

14b. How did you monitor and/or assess this impact? (Please describe)

15. What impact, if any, do you think the Maths Champions programme has had on general nursery practice? (Please describe)

16. What impact, if any, do you think the Maths Champions programme has had on staff practice in your nursery? (Please describe)

17a. If you did, please describe how you included parents/carers in the Maths Champions programme (Please describe)

17b. What impact, if any, do you think the Maths Champions programme has had on the maths activities parents/carers do with their children? (Please describe)

18. Would you recommend the Maths Champions programme to other nurseries? (Please circle one)

Yes, definitely *Probably* *Probably not* *No, definitely not*

Please explain your answer below:

Thank you very much for completing the questionnaire. If you have any further questions or comments please get in touch by emailing: MathsChampionsEvaluation@cem.dur.ac.uk or calling Dr Lyn Robinson, Project Researcher, on: 0191 334 4197.

MATHS CHAMPIONS EVALUATION

NURSERY PRACTITIONER SURVEY

We would like to learn more about your experience of the Maths Champions programme. The information you provide will help us to develop a survey to evaluate Maths Champions in a large research project. Completing the survey should take no longer than 15 minutes.

Completing the survey is voluntary and you can leave any questions you do not wish to answer blank. This survey is at a pilot stage and we appreciate any feedback you can give us about any of the questions especially if any questions are unclear.

1. How useful did you find the following aspects of the Maths Champions programme? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
e-safety training					
Initial settings audits					
Staff confidence audit					
BKSB initial assessment					
BKSB activities					
Online training courses					
Monthly webinars					
Resource bank					
NDNA setting-specific support					

2. How useful did you find the following training courses? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
Maths in the Early Years *(to help you to understand what maths is, how brain development supports this and how to plan for maths)*					
Let's look at number *(focusing on the aspect of number through the different age groups in your setting – separated out into principles of the EYFS)*					
Let's look at shape, space and measure *(focusing on the aspect of shape, space and measure through the different age groups in your setting – separated out into principles of the EYFS)*					

3. Do you think that the Maths Champions activities from the resource bank were appropriately pitched for use with children aged 3-4 years old? (Please circle one)

Completely appropriate *Mostly appropriate* *Somewhat appropriate* *Not at all appropriate*

4. Were the Maths Champions materials easy for you to understand? (Please circle one)

Yes, all of them *Most of them* *Some of them* *None of them*

5. What additional support or resources would have been helpful to you, if any? (Please describe)

6a. How many hours did you spend per week doing your own personal development during the initial set-up the Maths Champions programme?

☐ hours

6b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

7a. After the initial set-up of the Maths Champions programme, how many hours did you spend per week doing your own personal development for the programme?

☐ hours

7b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

8. How much support did you receive from your setting's Maths Champion during the initial set-up of the programme? (Please circle one)

Very supported *Supported* *Somewhat supported* *Not at all supported*

9. After the initial set-up of the programme, how much support did you receive from your setting's Maths Champion? (Please circle one)

Very supported *Supported* *Somewhat supported* *Not at all supported*

10. What were the challenges/barriers, if any, to using the Maths Champions programme within your nursery setting? (Please explain)

POTENTIAL IMPACT OF THE PROGRAMME

11. What impact, if any, do you think the Maths Champions programme has had on your own practice within the nursery? (Please describe)

12. What impact, if any, do you think the Maths Champions programme has had on children's development in your nursery? (Please describe)

13. What impact, if any, do you think the Maths Champions programme has had on general nursery practice? (Please describe)

14. If you did, please describe how you included parents/carers in the Maths Champions programme (Please describe)

15. What impact, if any, do you think the Maths Champions programme has had on the maths activities parents/carers do with their children? (Please describe)

16.. Would you recommend the Maths Champions programme to other nurseries? (Please circle one)

Yes, definitely *Probably* *Probably not* *No, definitely not*

Please explain your answer below:

Thank you very much for completing the questionnaire. If you have any further questions or comments please get in touch by emailing: MathsChampionsEvaluation@cem.dur.ac.uk or calling Dr Lyn Robinson, Project Researcher, on: 0191 334 4197.

MATHS CHAMPIONS PILOT STUDY

RESEARCH INVITATION:

INFORMATION FOR NURSERIES

The Education Endowment Foundation is funding a large research project to evaluate the Maths Champions programme developed by the National Day Nursery Association (NDNA). This project will work with 120 nursery settings and will start in summer 2016. The team responsible for the research are from the University of York and Durham University. Before starting this large project, we would like to understand the best way to collect some of the information we will require from nurseries, parents and children. To do this, we are seeking six nurseries to work with us as part of a pilot study. We are contacting you because your nursery has already participated in or is currently participating in the Maths Champions programme. This information sheet gives you more information about what being involved in the pilot study would mean for you and your nursery.

WHAT DOES TAKING PART IN THE PILOT STUDY INVOLVE?

As part of the pilot study we would like you to share information with us on the age and attendance of children in your nursery. This will enable us to estimate how many children fit certain criteria within nursery settings.

We would also like you to conduct a short assessment called ASPECTS with some of the children (maximum of ten) within your nursery. These children must be aged three, due to attend school in September 2016 and attend nursery for at least 15 hours each week. Children complete ASPECTS with an adult and it usually takes around 15 minutes. Children tend to enjoy using ASPECTS as the computer tells a story and then asks the children to answer questions about it. In preparation for using ASPECTS, we will provide a one-hour training session via webinar. This information will help us to understand the best way to prepare nursery staff to conduct ASPECTS and identify any practical issues that may arise, in preparation for the larger project. Further information on the ASPECTS assessment can be found here: http://www.cem.org/early-years

Before using ASPECTS, we would like you to distribute and collect consent forms from children's parents/guardians. We will provide you with an information sheet and a consent form to give to parents/guardians. Parents/guardians do not have to consent to their children taking part in the ASPECTS assessment if they do not want to.

To help us understand nursery practitioners' experiences of the Maths Champions programme, we have developed a questionnaire. We would like practitioners involved in the programme in your nursery to complete this questionnaire so that we can ensure we have included the right kind of questions. The questionnaire will take no longer than 15 minutes for practitioners to complete.

On the day you use ASPECTS with the children, a member of the project team will come along to the nursery to ask you and the nursery staff about conducting ASPECTS, gathering parent/guardian consent forms and competing the questionnaire.

WHAT DO YOU GET FOR TAKING PART IN THE PILOT STUDY?

For taking part in the pilot study, your nursery will receive a £250 Amazon voucher by way of reimbursement for the time your nursery has spent. We also hope that participating in the pilot will provide useful feedback for the nurseries, as you will be provided with the data generated from your children's ASPECTS assessments.

DATA PROTECTION

All data collected during research project will be stored securely, treated confidentially and used only for research purposes. Any information collected about the nursery and children within it will be analysed anonymously and will not be identified in any report. For the purpose of the study, information provided will be linked with the National Pupil Database (held by the Department for Education), other official records, and shared with NDNA, the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form to the UK Data Archive.

WHO ARE THE PROJECT TEAM?

A research team from the University of York and the Centre for Evaluation and Monitoring (CEM) at Durham University have been asked to see how effective the Maths Champions programme is by the Education Endowment Foundation, an organisation that funds research into education.

YOUR NURSERY IS INTERSTED IN TAKING PART: NEXT STEPS

If your nursery would like to participate in the pilot for the MC evaluation, please return a signed [MC_Nursery Consent Form_Pilot Study_v1] to the evaluation team, contact details below, as soon as possible.

CONTACT DETAILS

For further information please contact Dr Lyn Robinson (Project Researcher, Durham University) on 0191 334 4197 or by email mathschampionsevaluation@cem.dur.ac.uk

MATHS CHAMPIONS PILOT STUDY

NURSERY CONSENT FORM

To be completed by the nursery manager. Please tick each box, sign and provide information below.

- ☐ I confirm that I have read and understood the Maths Champions Pilot Study information sheet and have had the opportunity to ask questions.

- ☐ I agree to distribute information sheets and consent forms to parents, and return completed forms to the research team. The research team will provide the relevant documents to do this.

- ☐ I agree to assign one member of nursery staff to assist children in completing the ASPECTS assessment during March 2016 (15 minutes per child). I understand that this will require the staff member to participate in a training session via webinar that will last one hour.

- ☐ I agree to send the research team the child information required as detailed in the information sheet. The project team will only use any information gathered in this project for research purposes as described.

- ☐ I understand that members of the project team will visit the nursery in order to observe ASPECTS, to talk to nursery staff and request staff complete the practitioner questionnaire. Consent will be sought from those involved prior to observation or interview.

- ☐ I understand that by agreeing to take part in this project the nursery will receive £250 in Amazon Vouchers for completing the practitioner questionnaires, gathering of parental/guardian consent, delivery of ASPECTS assessment to children and providing the required child information.

- ☐ I understand that all child and practitioner data will be kept confidential and that no material which could identify the nursery or individual children or practitioners will be used in any reports of this evaluation.

- ☐ I understand what is involved in and consent to the nursery taking part in the above study.

Nursery Manager's name: _____ Date_____

Nursery Manager's signature: _____

Email address: _____

Nursery name: _____ Nursery postcode: _____

MATHS CHAMPIONS PILOT STUDY

INFORMATION FOR PARENTS/GUARDIANS

Your child's nursery has signed up to take part in a pilot study to help us (the project team) understand the best way to collect some information on children's math skills. Doing so will help us to develop a large, research project called 'Maths Champions'. This information sheet gives you more detail about what being involved in the pilot study means for you and your child.

WHAT DOES THE PILOT STUDY INVOLVE?

As part of the pilot study, we (the project team) would like your child to take part in a short assessment while they are at nursery called ASPECTS which tells us about your child's maths and vocabulary skills. We would like your child to take part in ASPECTS during April 2016. This will help us to understand the best way to prepare nursery staff to collect this type of information through ASPECTS. Children complete ASPECTS with an adult and it usually takes around 15 minutes. Children tend to enjoy using ASPECTS as the computer tells a story and then asks the children to answer questions about it but if your child does not want to take part in the ASPECTS on the day, they do not have to.

Once children reach school, their educational outcomes can be tracked using a national database (called the National Pupil Database (NPD) which is held by the UK's Department for Education). To do so, researchers need to know which school children attend once they leave nursery. We would like to collect the details of which school your child attends in September 2016 from your child's nursery, but if they do not have this, we would like to contact you to find out. It is important to note that in the context of this pilot study, we will not track your children's educational outcomes using the NPD, rather we are checking to see if our administration processes would allow us to do so in preparation for the large future research project.

DATA PROTECTION

All data collected during the research project will be stored securely, treated confidentially and used only for research purposes. Any information collected about your child will be analysed anonymously and will not be identified in any report. None of the information we collect will affect your child's place at nursery. For the purpose of the study, information provided will be linked with the National Pupil Database (held by the Department for Education), other official records, and shared with NDNA, the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form to the UK Data Archive.

WHO ARE THE PROJECT TEAM?

The Maths Champions programme is being delivered by the National Day Nursery Association (NDNA). A research team from the University of York and the Centre for Evaluation and Monitoring (CEM), Durham University have been asked to see how effective the MC programme is by the Education Endowment Foundation (EEF), an organisation that funds research into education.

WHAT DO I NEED TO DO NEXT?

If you are happy for your child to take part in the pilot study, please sign and return the attached consent form to your child's nursery. If you do not want your child's information to be collected and used, do not sign the consent form.

WHERE CAN I GET FURTHER INFORMATION?

Further information on the Maths Champions programme can be found here: http://www.ndna.org.uk/NDNA/Community/Maths_Champions.aspx

Or you can contact Jo Baranek from NDNA on 07881 951 713 or by email jo.baranek@ndna.org.uk

Further information on the ASPECTS assessment can be found here: http://www.cem.org/early-years

Or for information about the research evaluation more generally you can contact Dr Lyn Robinson (Project Researcher, CEM, Durham University) on 0191 334 4197 or by email mathschampionsevaluation@cem.dur.ac.uk

MATHS CHAMPIONS (PILOT STUDY)

PARENT/GUARDIAN CONSENT FORM

If you are happy for your child to participate in this research study, please read each of the following statements and if you agree to them ***initial the boxes*** and provide the necessary information on the following sheet and return to the nursery.

I confirm that I have read and understood the information sheet (MC_Parent/Guardian Information Sheet_Pilot Study_v1) about the evaluation of the Maths Champions Pilot Study and have the contact details of the people I need to ask if I have any questions.	☐
I understand that information about my child collected as part of this research will be stored securely, treated confidentially and used only for research purposes. Information about my child will be analysed anonymously and that my child's name will not be used in any research reports or publications.	☐
I agree for my child to take part in the ASPECTS assessment while they are at nursery.	☐
I understand that I can withdraw my child from the research study at any time by contacting the research team.	☐
I agree for the nursery to provide the research team with details of which school my child attends in September 2016 along with gender and date of birth to be used for research purposes only.	☐
If the nursery does not have information of my child's school, I agree to be contacted in the autumn 2016 to confirm which school my child is attending.	☐
I understand and agree that, for the purpose of the study, information collected about my child will be linked with the National Pupil Database (held by the Department for Education), other official records, and shared with the NDNA team, the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form with the UK Data Archive.	☐
I understand that the information collected from the National Pupil Database will include ethnicity data.	☐

PLEASE TURN OVER

Child's Name:_____

Address: _____

_____

_____

_____

Telephone number:_____

Contact email: _____

Parent/Guardian name: _____

Parent/Guardian signature: _____

Date: _____

Thank you for your time

MATHS CHAMPIONS RESEARCH PROJECT

INFORMATION FOR NURSERIES

WHAT IS THE PROJECT ABOUT?

The Maths Champions programme has been developed by the National Day Nursery Association (NDNA) to improve nursery practitioners' knowledge and confidence in developing children's maths skills. This research project aims to investigate how much difference the Maths Champions programme makes to nursery children's maths attainment. The project also will investigate whether Maths Champions changes practitioner confidence, practice and the way the nursery setting is run. The research will compare nurseries that do the Maths Champions programme with similar nurseries that don't have access to the programme.

The Maths Champions programme enlists graduates in early years settings to the challenging task of empowering their teams to really bring maths to life. Having fun with numbers - counting, measuring distances, calculating weights and measures - opens up a whole new world of excitement and curiosity for preschool children and sets a great precedent for their educational journey ahead. Many practitioners think they can't do maths, but Maths Champions aims to show them that, yes, they can! The Maths Champions programme offers support to nurseries to evaluate their own current practice, provides online training and resources and supports practitioners to improve their own knowledge and confidence with maths.

We are looking for 120 privately-run nurseries that employ a graduate practitioner to take part in the Maths Champions research project. We are only able to fund up to 60 nurseries to receive the Maths Champions programme from August 2016 to August 2017. Nurseries will be placed into a random ballot to decide which nurseries receive the programme. Nurseries that are not selected to receive the programme will form the project's 'comparison group' and will still need to complete certain elements of the research project (described below). Your nursery will receive £500 for taking part in the research project, regardless of whether your nursery is allocated to receive the Maths Champions programme or not. Randomly selecting which nurseries receive the programme is essential to the research project, as it is the best way of knowing the effect Maths Champions has on children's attainment. It means that the group that do Maths Champions is similar to the group that forms the comparison groups and means we can be sure about the results. It is important that nurseries understand and agree to this process.

WHAT IS MATHS CHAMPIONS AND WHAT WILL IT INVOLVE?

The Maths Champions programme itself, and all associated resources, are based online. Should your nursery be assigned the programme it would need to be led by the graduate in your setting. The graduate would mentor the rest of the nursery's practitioners, in particular those who work with children aged 3-4 years old.

The programme starts with two online courses to support your setting's graduate in becoming a 'Maths Champion'. These help the Maths Champion to evaluate their practice and measure the impact in all they do, and also give them the skills to mentor and lead the team in the programme. Each course takes around two hours but can be completed in short sections.

The Maths Champion then works with the team to evaluate the nursery's current practice, using audit tools provided, including providing details of their own and the nursery's three year olds' maths skills. At this stage, practitioners would also complete a short questionnaire to rate their confidence in maths. This information will help NDNA to create a tailored programme to support your setting.

From this point, the programme is made up of three main components:

(1) The award-winning BKSB skills assessment tools which can help the team improve their own personal maths skills with 1-1 support from your setting's Maths Champion (taking around 10-15 minutes per month).

(2) Three online courses throughout the year for the Maths Champion to gain information to pass onto practitioners.

(3) An online resource bank providing maths ideas to build into the nursery's daily practice. These resources are reinforced by short monthly webinars available for your setting's Maths Champions team to take part in and view, with focused themes to help the team implement maths into their continuous provision and everyday practice.

Throughout the programme the Maths Champion will also receive tailored 1-1 support from NDNA.

Towards the end of the programme, your team will be asked to revisit initial audits to assess any changes in your setting as well as any improvement in the children's and staff's own maths skills.

For more information on the Maths Champions programme, visit http://www.ndna.org.uk/NDNA/Community/Maths_Champions.aspx or contact NDNA below.

WHAT ELSE WOULD THE NURSERY NEED TO DO FOR THE PROJECT?

All nurseries signed up to the project (Maths Champions nurseries and the comparison group) will need to provide the research team with information about their nursery, pupils and practitioners at different stages throughout the project.

During May 2016, all nurseries will be asked to gather information on the maths and vocabulary skills of some of the nursery children using a short assessment called ASPECTS. The assessment is computer based and takes around 15 minutes to complete for each child. Children tend to enjoy using ASPECTS, as they are guided through the assessment by a story, which asks the children questions. Children complete ASPECTS with an adult, who indicates their answers to each of the questions on the computer screen. We ask that each nursery nominates one practitioner to complete ASPECTS with the children. This practitioner will receive full training (via a one hour webinar) from the project team on how to conduct ASPECTS. It is only necessary for a maximum of ten children within each nursery to

complete ASPECTS, these children should be due attend school in September 2017 and attend nursery for at least 15 hours per week.

Further information on the ASPECTS assessment can be found here: http://www.cem.org/early-years

Before these children complete ASPECTS, we will require parental consent. We will provide you with an information sheet and a consent form to distribute to parents. Parents are to return the complete forms to the nursery who should return these to the research team. Parents do not have to consent to their child to participate in ASPECTS if they do not want to.

During June/July 2017, we will arrange for a researcher to visit the nursery and complete ASPECTS again with the same children. This information will help us to see how children's maths skills have changed during their time at nursery. Another researcher will also arrange to attend the nursery to observe current practice and to distribute questionnaires to practitioners within your nursery.

Throughout the project, a member of the research team may wish to visit some of the participating nurseries to talk to practitioners and observe the nursery's maths practice.

INFORMATION REQUIRED

On signing up to the project, we need to know how many children within your nursery are due to start school in September 2017 and attend nursery for at least 15 hours each week. We will also require the nursery to provide information on the children whose parents have consented to them being part of the project (e.g. name, date of birth, gender, home postcode, ethnicity). In July/August 2017, we will require an update on children's information whose parents have consented to them being part of the research project. This information includes where each child is planning on going to school in September 2017. With this information, the project team will use a national database (called the National Pupil Database which is held by the UK's Department for Education) to follow the children's educational outcomes in the future.

HOW WILL DATA COLLECTED FROM NURSERIES BE USED IN THIS PROJECT?

Data collected as part of this project will be used only for research purposes and will be collected to evaluate the Maths Champions programme, its impact on nursery practitioners and children, and how the programme is implemented. We will handle all research data confidentially and in line with the Data Protection Act. During the project, data will be shared between the universities involved but will only be accessed by the specific staff working on the project. Child data provided to us as part of this project will be matched to other data from the National Pupil Database to provide us with contextual information for our analyses and to allow longer term tracking of pupil outcomes.

This research trial is being funded by the Education Endowment Foundation (EEF). The EEF is an independent grant-making charity dedicated to breaking the link between family income and educational achievement. They require that all data collected in the project is transferred at the end of the project to a secure data archive managed by the Fisher Family

Trust. This will allow the EEF to track pupils' progress longitudinally through further linking to the National Pupil Database so they can investigate the longer term impact of different educational interventions.

WHO IS RUNNING THE PROJECT AND WHO DO I CONTACT FOR FURTHE INFORMATION?

Maths Champions is delivered by the National Day Nurseries Association (NDNA), and is being independently evaluated through a randomised controlled trial by an evaluation team based in York Trials Unit at the University of York and Durham University.

For further information on the Maths Champions programme, please contact Jo Baranek from NDNA on 07881 951 713 or by email jo.baranek@ndna.org.uk.

For further information on the independent evaluation of the Maths Champions programme, please contact Dr Lyn Robinson (Project Researcher, CEM Durham University) on 0191 334 4197 or by email mathschampionsevaluation@cem.dur.ac.uk.

DO WE HAVE TO TAKE PART?

Participation in the Maths Champions research project is voluntary; you should choose whether you would wish your nursery to take part. If you do wish to be involved we will ask that the nursery manger to sign a consent form (attached) showing that they understand and agree to all aspects of taking part in the project.

PROJECT TIMELINE

The table below shows the anticipated timeline for all elements of the project.

When	Who (which nurseries)	What
1st May 2016	ALL	Deadline for signing up to the project
May 2016	ALL	Nurseries provide age and attendance data of children to project team
	ALL	Nursery staff collect consent from parents for their child to participate in the research project
	ALL	Nominated nursery practitioner receives webinar training from research team for completing ASPECTS
June 2016	ALL	Nursery staff complete ASPECTS with children
July 2016	ALL	Nurseries find out which group they have been allocated to (Maths Champions programme or comparison group)
August 2016	Maths Champions group only	Nurseries allocated to the Maths Champions group complete Memorandum of Understanding
	Maths Champions group only	Maths Champions complete initial settings audit
	Maths Champions group only	Maths Champions undertake programme
June/July 2017	ALL	Visits arranged for researchers to attend the nursery to complete ASPECTS, observe nursery practice and distribute questionnaires to practitioners
August 2017	Maths Champions group only	Maths Champions nurseries complete final settings audit
August/September 2017	ALL	Nurseries to provide information to the project team regarding children's school destination
August/September 2017	ALL	Nurseries receive £500

MATHS CHAMPIONS RESEARCH PROJECT

NURSERY MEMORANDUM OF UNDERSTANDING

To be completed by the nursery manager. Please tick each box, sign and provide information below.

- ☐ I confirm that I have read and understood the information sheet for the Maths Champions Research Project and have had to opportunity to ask questions.
- ☐ I understand that by agreeing to take part in this project the nursery will be randomly assigned in July 2016 to either the Maths Champions intervention group or the comparison group:
    - Nurseries in the Maths Champions intervention group will begin the Maths All nurseries will receive £500 for taking part in the research project (e.g. complete practitioner surveys, gathering of parental consent, delivery of ASPECTS assessment to children)
- ☐ I understand what is involved for nurseries in both groups and agree to take part in the project whichever group the nursery is assigned to.
- ☐ I agree to distribute information sheets and consent forms to parents, and return completed forms to the research team. The research team will provide the relevant documents to do this.
- ☐ I agree to assign one member of nursery staff to assist children in completing the ASPECTS assessment during May 2016 (15 minutes per child). I understand that this will require the staff member to participate in a training session via webinar that will last one hour.
- ☐ I agree to send the research team the pupil information require as detailed in the information sheet. The project team will only use any information gathered in this project for research purposes as described.
- ☐ I understand that members of the project team will visit the nursery in order to observe practice, on more than one occasion if necessary, to talk to nursery staff. Consent will be sought from those involved prior to observation or interview.
- ☐ I understand that all child and practitioner data will be kept confidential and that no material which could identify the nursery or individual children or practitioners will be used in any reports of this evaluation.
- ☐ I consent to the school taking part in the above study.

Nursery Manager name: _____ Date_____

Nursery Manager signature: _____

Email address: _____

Nursery name: _____ Nursery postcode: _____

THE MATHS CHAMPIONS RESEARCH PROJECT

PARENT/ GUARDIAN INFORMATION SHEET

Your child's nursery has agreed to take part in a research project to see if 'Maths Champions' improves children's maths skills. This information sheet explains what being involved in the research project means for you and your child.

WHAT IS MATHS CHAMPIONS?

Maths Champions is a programme designed to help nursery staff better support children's maths development through activities and play in pre-school. It is a training programme for nursery staff which aims to help them understand how children learn about maths and how they can best help children in nursery.

This project aims to find out if Maths Champions improves children's maths by comparing nurseries that use it (group 1) with those who do not (group 2). When your child's nursery signed up to the research project, they agreed to be randomly allocated to either of these groups. Your nursery will find out which group they have been allocated to in July 2016 and they will inform you of this, should you wish to know. If your nursery is allocated to the Maths Champions programme, staff will have the opportunity to receive training and may change their maths related practice as a result of this; however this is at the discretion of each nursery. Research such as this is really important if we are to improve education for generations of children to come. Maths Champions is an approach which aims to build upon nursery staff's existing expertise.

Regardless of which group your child's nursery is allocated to, we (the research team) would like your child to take part in a short assessment while they are at nursery called ASPECTS which tells us about your child's maths and vocabulary skills. This is so we can compare how children make progress. ASPECTS is provided by the Centre for Evaluation and Monitoring at Durham University. We would like your child to take part in ASPECTS once during June 2016, and once during June 2017. This information will help us to see how children's maths skills have changed during their time at nursery. Children complete ASPECTS with an adult and it usually takes around 15 minutes. Nursery staff will sit with your child to complete ASPECTS in June 2016, and then a member of the research team will sit with your child again in June 2017, whilst they are in nursery. Our experience is that children enjoy ASPECTS as the computer tells a story and then asks the children to answer questions about it. If your child does not want to take part in the ASPECTS on the day, they do not have to. Your nursery will be able to share your child's ASPECTS results with you.

Following their time at the nursery, we would also like to see how children's maths skills develop once they go to school. To do this, we need to know what school your child will attend in September 2017.To help us to do this, we would like to collect the following information on your child: date of birth, gender and ethnicity. We would like to collect this information from the nursery, but if they do not have this, we would like to contact you to find it out. With this information, we will use a national database (called the National Pupil Database which is held by the UK's Department for Education) to follow your child's educational outcomes in the future.

DATA PROTECTION

All data collected during research project will be stored securely, treated confidentially and used only for research purposes. Your child and your child's nursery will not be identifiable in any report. None of the information we collect will affect your child's place at nursery or school. For the purpose of the study, information provided will be linked with the National Pupil Database (held by the Department for Education), other official records, and shared with National Day Nursery Association (NDNA) the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form in the UK Data Archive. The Centre for Evaluation and Monitoring (CEM) at Durham University may use the ASPECTS data in an anonymised form for the purpose of internal research and standardisation of their assessments and may share such anonymised data with third parties for use in their own research, and the results of this research may be used in publicly available documents. If you do not want your child's ASPECTS data used in such a way, please do not initial point 4 on the attached consent form. Your child can still complete the ASPECTS assessment should you consent.

The Maths Champions research project has received full ethical approval from Durham University's School of Education Ethics Committee and the University of York's Health Sciences Education Committee. All research staff who will enter nurseries as part of this project will have DBS clearance. At the end of the project a final report, which does not identify any individuals or nurseries, will be made publically available on the Educational Endowment Foundation website (https://educationendowmentfoundation.org.uk), for anyone who is interested in the findings of the research.

WHO ARE THE PROJECT TEAM?

The Maths Champions programme is being delivered by the National Day Nursery Association (NDNA). A research team from the University of York and from the Centre for Evaluation and Monitoring (CEM), Durham University have been asked to see how effective the Maths Champions programme is by the Education Endowment Foundation, which is an organisation that funds research into education.

WHAT DO I NEED TO DO NEXT?

If you are happy for your child to take part in the Maths Champions Evaluation, please sign and return the attached consent form to your child's nursery. If you do not want your child's information to be collected and used, do not sign the consent form.

WHERE CAN I GET FURTHER INFORMATION?

Further information on the Maths Champions programme can be found here:
http://www.ndna.org.uk/NDNA/Community/Maths_Champions.aspx

Or you can contact Jo Baranek from NDNA on 07881 951 713 or by email jo.baranek@ndna.org.uk

Further information on the ASPECTS assessment can be found here:
http://www.cem.org/early-years

Or for information about the research evaluation more generally you can contact Dr Lyn Robinson (Project Researcher, CEM, Durham University) on 0191 334 4197 or by email mathschampionsevaluation@cem.dur.ac.uk

MATHS CHAMPIONS RESEARCH PROJECT

PARENT/GUARDIAN FAQ SHEET

What is the Maths Champions programme? It is a training programme delivered by the National Day Nursery Association (NDNA) for nursery staff, which aims to help them understand how children learn about maths and how they can best help children in nursery.

Will I find out if my child's nursery has been randomly allocated to receive the Maths Champions programme (group 1) or not (group 2)? Your nursery will find out which group they have been allocated to in July 2016 and can inform you of this, should you wish to know.

What happens if my child's nursery receives the Maths Champions programme? If your child's nursery is allocated to the Maths Champions programme, staff will have the opportunity to receive training and this in turn may change their maths related practice; however this is at the discretion of each nursery.

What is the ASPECTS assessment? It is a short computer based assessment which tells us about your child's maths and vocabulary skills. Our experience is that children enjoy ASPECTS as the computer tells a story and then asks the children to answer questions about it.

Will my child definitely complete the ASPECTS assessment? Within each nursery we will randomly select 10 children whose parents have provided consent to complete the ASPECTS assessment. We will inform each nursery of the children who have been randomly selected and they can let you know if this includes your child.

Who completes the ASPECTS assessment with my child? Children complete ASPECTS with an adult and it usually takes around 15 minutes. Nursery staff will sit with your child to complete ASPECTS in June 2016, and a member of the research team will sit with your child again in June 2017, whilst they are in nursery.

Can I find out my child's ASPECTS results? The nursery will be able to share your child's ASPECTS results with you if requested, or they may choose to do this anyway.

Has the Maths Champions Research Project received Ethical Approval? The Maths Champions research project has received full ethical approval from Durham University's School of Education Ethics Committee and the University of York's Health Sciences Education Committee.

Do the Maths Champions project research team have DBS clearance? All research staff who will enter nurseries as part of this project will have DBS clearance.

Where can I find out the results of the Maths Champions Research Project? At the end of the project a final report, which does not identify any individuals or nurseries, will be made publically available on the Educational Endowment Foundation website (https://educationendowmentfoundation.org.uk), for anyone who is interested in the findings of the research.

I've signed a consent form for my child to take part but I've changed my mind, what do I do? You are free to withdraw your child from the research project at any time. If you wish to do so, please tell your nursery or contact us directly: Tel. 0191 334 4268, Email: MathsChampionsEvaluation@cem.dur.ac.uk

THE MATHS CHAMPIONS RESEARCH PROJECT

PARENT/GUARDIAN CONSENT FORM

If you are happy for your child to participate in this research study, please read each of the following statements and if you agree to them ***initial the boxes*** then please fill in the other details and return to the nursery.

1. I confirm that I have read and understood the information sheet about the Maths Champions Research Project and have the contact details of the people I need to ask if I have any questions. ☐

2. I understand that information about my child (e.g. date of birth, gender, ethnicity) collected as part of this research *will be stored and handled in line with the requirements of the Data Protection Act, stored securely, treated confidentially* and used only for research purposes. Information about my child will be analysed anonymously and that my child's name will not be used in any research reports or publications. ☐

3. I agree for my child to take part in the ASPECTS assessment (provided by CEM at Durham University) while they are at nursery. ☐

4. I agree for the Centre for Evaluation and Monitoring (CEM) at Durham University to use my child's ASPECTS data in an anonymised form for the purpose of internal research and understand that CEM may share such anonymised data with third parties for use in their own research, and the results of this research may be used in publicly available documents. ☐

5. I understand that I can withdraw my child from the research study at any time by contacting the research team. ☐

6. I agree for the nursery to provide the research team with information about my child, e.g. which school my child will attend in September 2017, gender and date of birth to be used for research purposes only. ☐

7. If the nursery does not have information of my child's school, I agree to be contacted in the autumn 2017 to confirm which school my child is attending. From the options below, please circle how you would preferred to be contacted: ☐

By telephone By Email By Post

8. I understand and agree that for the purpose of the study, information collected about my child will be linked with the National Pupil Database (held by the Department for Education), other official records, and shared with the NDNA team, the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form with the UK Data Archive. ☐

9. I understand that this information collected from the National Pupil Database will incorporate data including ethnicity. ☐

Child's name:_____

Parent/Guardian name: _____

Address: _____

_____

_____

_____

Telephone number:_____

Contact email: _____

Parent/Guardian signature: _____

Date: _____

Thank you for your time

MATHS CHAMPIONS RESEARCH PROJECT

PARENT/GUARDIAN INFORMATION AND CONSENT FOR RESEARCHER ASSESSMENT

You have provided consent for your child to complete the ASPECTS assessment as part of the Maths Champions Research Project. The nursery your child attends has opted to have a member of the research team to visit the nursery during September 2016 and sit with the children to complete ASPECTS. As explained in the project information sheet you have already received, ASPECTS usually takes around 15 minutes to complete. The researcher who will sit with your child to complete ASPECTS has an enhanced DBS check and are accustomed to working with children. Our experience is that children enjoy ASPECTS as the computer tells a story and then asks the children to answer questions about it. If your child does not want to take part in the ASPECTS on the day, they do not have to. Your nursery will be able to share your child's ASPECTS results with you.

If you are happy to have your child assessed by a researcher and have already completed a consent form to have your child take part in the project, please tick each box, sign and provide information below.

- ☐ I confirm that I have read and understood the information sheet for the Maths Champions Research Project, have had to opportunity to ask questions and consented to my child taking part.

- ☐ I am happy for a member of the research team to assess my child using ASPECTS during nursery time for the purposes of this research project.

Child's Name: _____

Parent name: _____

Parent signature: _____ Date: _____

Address: _____

_____Postcode: _____

Telephone Number:_____

Email address: _____

Rowan House
Mountjoy Centre
Durham University,
Stockton Road
Durham, UK DH1 3UZ
Tel: +44 (0) 191 334 4268

[date]

Dear Parent/Career of [insert child's name],
MATHS CHAMPIONS RESEARCH PROJECT: FOLLOW-UP ASSESSMENT

Thank you for your involvement in the Maths Champions Research Project so far. In Spring 2016, you provided consent for your child to take part in the Maths Champions Research Project (please find attached a copy of your signed consent form), which involves your child completing the ASPECTS assessment between 2016-2017, during their time at nursery. In summer 2016, staff at your child's nursery sat with your child to complete ASPECTS for the first time. We would now like your child to complete the ASPECTS assessment for the final time in June 2017.

ASPECTS is a short assessment which children complete while at nursery and tells us about their maths and vocabulary skills and is provided by the Centre for Evaluation and Monitoring (CEM) at Durham University. Children complete ASPECTS with an adult and it usually takes around 10 minutes. Further information on the Maths Champions research project and the ASPECTS assessment can be found in the information sheet which you received at the beginning of the project, we have included it here again for your information.

For your child to complete ASPECTS assessments in June 2017, a member of our research team will visit your child's nursery and sit with them to complete ASPECTS during nursery time. Our experience is that children enjoy ASPECTS as the computer tells a story and then asks the children to answer questions about it. We will arrange this visit directly with your child's nursery. Your nursery will be able to share your child's ASPECTS results with you. If your child does not want to take part in the ASPECTS on the day, they do not have to.

[Updated] Data Protection Statement
All data collected during the research project will be stored securely, treated confidentially, shared between the research teams at the University of York and Durham University and used only for research purposes. Everyone who has access to the project's data has a duty of confidentiality and is responsible for handling study data in accordance with applicable Data Protection law(s) and has undergone

relevant data protection training. Your child and your child's nursery will not be identifiable in any report. None of the information we collect will affect your child's place at nursery or school. For the purpose of the study, information provided will be linked with the National Pupil Database (held by the Department for Education), other official records, and this linked data will be shared between the research teams at Durham University and the University of York and with National Day Nursery Association (NDNA) the Department for Education, Education Endowment Foundation (EEF), EEF's data contractor FFT Education and in an anonymised form in the UK Data Archive.

The Centre for Evaluation and Monitoring (CEM) at Durham University may use the ASPECTS data in an anonymised form for the purpose of internal research and standardisation of their assessments and may share such anonymised data with third parties for use in their own research, and the results of this research may be used in publicly available documents. If you do not want your child's ASPECTS data used in such a way and did not already indicate this by leaving point 4 on the initial consent form blank, please get in touch with us using the details below. Your child can still complete the ASPECTS assessment should you consent.

Research team at the University of York and Durham University will store the data gathered from the project, including personal data, for up to five years after the end of the trial, to allow time for it to be properly analysed, published and reviewed. After this period it will be securely destroyed.

What do you need to do?

If you are happy for your child to continue their participation in the Maths Champions research project, you do not need to do anything.

If you have changed your mind and you do not want your child to complete the ASPECTS post-test, please contact our Research Administrator, Sarah Hallett on mathschampionsevaluation@cem.dur.ac.uk or by telephone 0191 334 4268. You have the right to request for your child's data, which has been collected as part of this research project, (including data from the first ASPECTS assessment) to be securely deleted or you can allow for us to keep the data we have collected so far. Data is to be used solely for research purposes as detailed in the data protection statement above.

Yours sincerely,

Dr Lyn Robinson on behalf of the Maths Champions Evaluation Team
Principal Investigator, CEM, Durham University

Trial ID: XXXX

MATHS CHAMPIONS EVALUATION

PRACTITIONER CONFIDENCE SURVEY (from Chen et al., 2014[1])

As part of the Maths Champions research project, we are interested in exploring your thoughts on how children (aged 3-4) learn maths, how confident you are in helping the children in your nursery learn maths and in your own maths abilities. To help us with this, we would like you to compete this short survey, it should take no longer than 10 minutes to complete. Completing this survey is voluntary and you can leave any questions you do not wish to answer blank. **Please read the information below, initial the boxes if you agree and then sign and complete the details at the bottom of this page.**

- I agree to take part in the practitioner confidence survey as part of the Maths Champions research project. ☐
- I understand that information about me collected as part of this research will be stored securely, treated confidentially and used only for research purposes. Information about me will be analysed anonymously and my name will not be used in any research reports or publications. ☐
- I understand that I can withdraw from the research study without giving a reason and at any time until 30th November 2017 (before the final report is completed) by contacting the research team (details below). ☐
- I understand and agree that for the purpose of the study, information collected about me may, be shared between the research teams at the University of York and Durham University, with the NDNA, the Education Endowment Foundation (EEF), the EEF's data contractor FFT Education and in an anonymised form, the UK Data Archive. ☐

Your name	
Your role	
Nursery name	
Nursery postcode	
Your signature	
Date	

What is your highest qualification in maths? Please circle:						
Degree	A Level	GCSE (A-C)	GCSE (D-F)		Functional skills 1	Functional skills 2
Other (please state):						

[1] Chen, J. Q., McCray, J., Adams, M., & Leow, C. (2014). A Survey Study of Early Childhood Teachers' Beliefs and Confidence about Teaching Early Math. *Early Childhood Education Journal*, *42*(6), 367-377.

Trial ID: XXXX

1. Your Beliefs about Nursery Aged Children and Maths

Below are some ideas from nursery staff about children aged 3-4 years old and maths. On this page, please indicate what you think about these ideas. **For each of the following statements, please tick one box which is most appropriate.**

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
Most children in my group enter nursery with little maths knowledge					
Most children in my group have the cognitive abilities to learn maths					
Most children in my group should be helped to learn maths in nursery					
Most children in my group are very interested in learning maths					
Most children in my group need to learn maths in nursery to be ready for school					
Most children in my group learn a great deal about maths through their everyday activities					
Most children in my group need structured maths instruction in nursery					
Most children in my group should be helped to learn maths using a published maths curriculum (for example EYFS)					

Trial ID: XXXX

2. Your Confidence in Helping Nursery Aged Children Learn Maths

Some nursery practitioners have told us they don't feel comfortable helping nursery aged children learn maths. Others feel confident; still others say they are confident in some areas of maths but not in others.

2a. On this page, please indicate how confident you feel about helping nursery aged children learn maths. **For each of the following statements, please tick which is most appropriate.**

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
I am confident in my knowledge of what the children in my classroom know about maths when they enter nursery					
I am confident in my knowledge of reasonable maths goals for nursery aged children					
I am confident in my knowledge of the best practices and strategies for helping nursery aged children learn maths					
I am confident in my knowledge of local or national maths standards for nursery aged children (for example, EYFS and EYFS profile results)					
I am confident in my knowledge of the best ways to assess children's maths knowledge and understanding throughout the year					

2b. Please indicate how you confident feel in your own ability to help nursery aged children learn maths. **For each of the following statements, please tick which is most appropriate for you.**

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
I am confident in my ability to observe what nursery aged children know about maths					
I am confident in my ability to incorporate maths learning into common nursery situations (such as art or dramatic play)					
I am confident in my ability to plan activities to help nursery aged children learn maths					
I am confident in my ability to further children's maths knowledge when they make spontaneous maths comments/ discoveries *Example: When child says "I have four blocks" asking child how many blocks he would have if you gave him one more*					
I am confident in my ability to make sense of children's' confusions when they learn maths *Example: Why child thinks* ▽ *and* ◁ aren't the same shape					
I am confident in my ability to translate assessments into curriculum plans (i.e. turning assessments of children into next steps for learning)					

3. Your Confidence in your own Math Abilities

Some nursery practitioners have told us that they just aren't good at maths. Others say they love maths. Still others say how they feel depends on the specific area of maths.

On this page, please indicate how you feel about maths and your maths abilities.
For each of the following statements, rate your agreement by checking the appropriate box

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
Maths was one of my best subjects in school					
Just the word "maths" can make me feel nervous					
I'm not a "maths person"					
I can easily rotate objects in my mind *Example: Figuring out how something would look from another angle*					
I like coming up with creative ways to solve maths problems					
I can easily convert fractions into percentages					
I have a bad sense of direction					
I'm good at looking at numeric data and finding patterns					
I'm good at estimating how tall something is or the distance between two locations					

Thank you very much for sharing your experiences.

Once completed please detach the cover page and return the cover page and the remainder of the survey to the member of staff who gave you the survey who will return it to the research team.

If you have any questions about this survey you can contact:

Sarah Hallett (Research Administrator) on mathschampionsevaluation@cem.dur.ac.uk or by telephone 0191 334 4268.

EVALUATION SURVEY

Your Experience of the Maths Champions Programme

Please complete this survey if you are the nursery's MATHS CHAMPION

We would like to learn more about your experiences of being the Maths Champion in your nursery and leading the programme. The information you provide will help us to evaluate the Maths Champions programme. Completing the survey should take no longer than 15 minutes. Completing the survey is voluntary and you can leave any questions you do not wish to answer blank.

TRAINING, CONTENT AND SUPPORT

1. How useful did you find the following aspects of the Maths Champions programme? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
E-safety training					
Initial settings audits					
Staff confidence audit					
BKSB initial assessment					
BKSB activities					
Online training courses					
Monthly webinars					
Resource bank					
NDNA setting-specific support					

2. How useful did you find the following training courses? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
Train the Trainer *(to help you understand how to get the best out of your team's training, mentoring and coaching*)					
Evaluating your Practice and Impact Measurement *(to help you to evaluate your practice, action changes and measure the impact)*					
Maths in the Early Years *(to help you to understand what maths is, how brain development supports this and how to plan for maths)*					
Let's Look at Number *(focusing on the aspect of number through the different age groups in your setting – separated out into principles of the EYFS)*					
Let's Look at Shape, Space and Measure *(focusing on the aspect of shape, space and measure through the different age groups in your setting – separated out into principles of the EYFS)*					

3. Do you think that the Maths Champions activities from the resource bank were

appropriately pitched for use with children aged 3-4 years old? (Please circle one)

Completely appropriate	*Mostly appropriate*	*Somewhat appropriate*	*Not at all appropriate*

4. Were the Maths Champions materials easy for you to understand? (Please circle one)

Yes, all of them	*Most of them*	*Some of them*	*None of them*

5. What additional support or resources would have been helpful to you, if any? (Please describe)

6a. How many hours did you spend per week doing your own personal development for the initial set-up of the Maths Champions programme?

☐ hours

6b. Was this mostly at work or in your own time? (Please circle one)

Work	*Own time*

7a. After the initial set-up of the Maths Champions programme, how many hours did you spend per week doing your own personal development for the programme?

☐ hours

7b. Was this mostly at work or in your own time? (Please circle one)

Work	*Own time*

8. During the initial set-up of the Maths Champions programme in your setting, how often were you able to provide support to your Maths Champions team? (Please circle one)

At least once a week	*2 to 3 times a month*	*Once a month*	*Less than once a month*

Please give details of what this support was:

9. After the initial set-up of the Maths Champions programme, how often were you able to provide support to your Maths Champions team? (Please circle one)

At least once a week *2 to 3 times a month* *Once a month* *Less than once a month*

Please give details of what this support was:

MATHS CHAMPIONS PROGRAMME IN YOUR SETTING

10. Did you use the Maths Champions programme for the full year? (Please circle one)

Yes No

If no, please write how many weeks or months you used the programme for:

11. How engaged were your team at the start of the Maths Champions programme? (Please circle one)

Very engaged *Quite engaged* *Engaged for some parts* *Not at all engaged*

Please give more detail explaining your answer:

12. How engaged were your team throughout the Maths Champions programme? (Please circle one)

Very engaged *Quite engaged* *Engaged for some* *Not at all engaged*

parts

Please give more detail explaining your answer:

13. What were the challenges/barriers, if any, to using the Maths Champions programme within your nursery setting? (Please explain)

POTENTIAL IMPACT OF THE PROGRAMME

14a. What impact, if any, do you think the Maths Champions programme has had on children's development in your nursery? (Please describe)

14b. How did you monitor and/or assess this impact? (Please describe)

15. What impact, if any, do you think the Maths Champions programme has had on general nursery practice? (Please describe)

16. What impact, if any, do you think the Maths Champions programme has had on staff practice in your nursery? (Please describe)

17a. If you did, please describe how you included parents/carers in the Maths Champions programme (Please describe)

17b. What impact, if any, do you think the Maths Champions programme has had on the maths activities parents/carers do with their children? (Please describe)

18. Would you recommend the Maths Champions programme to other nurseries? (Please circle one)

Yes, definitely *Probably* *Probably not* *No, definitely not*

Please explain your answer below:

Thank you very much for completing the questionnaire. If you have any further questions or comments please get in touch by emailing: MathsChampionsEvaluation@cem.dur.ac.uk or calling Dr Lyn Robinson, Project Researcher, on: 0191 334 4197.

MATHS CHAMPIONS EVALUATION PRACTITIONER SURVEY

Please complete this survey if you teach children aged 3-4 years old.

We would like to learn more about your experience of the Maths Champions programme as a practitioner working with 3-4 year olds within your nursery. The information you provide will help us to develop a survey to evaluate Maths Champions in a large research project. Completing the survey should take no longer than 15 minutes.

Completing the survey is voluntary and you can leave any questions you do not wish to answer blank.

1. How useful did you find the following aspects of the Maths Champions programme? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
e-safety training					
Initial settings audits					
Staff confidence audit					
BKSB (GCSE) assessments					
BKSB (GCSE) module activities					
Online training courses					
Monthly webinars					
Online resource bank					
NDNA setting-specific support					

Please use the space on the following page to provide any comments you may have on any of the activities listed above:

2. How useful did you find the following training courses? (Please tick one per line)

	Very useful	*Quite useful*	*Somewhat useful*	*Not at all useful*	*Didn't complete*
Maths in the Early Years *(to help you to understand what maths is, how brain development supports this and how to plan for maths)*					
Let's look at number *(focusing on the aspect of number through the different age groups in your setting – separated out into principles of the EYFS)*					
Let's look at shape, space and measure *(focusing on the aspect of shape, space and measure through the different age groups in your setting – separated out into principles of the EYFS)*					

3a. How many days/weeks did the initial set-up of the Maths Champions programme take you and many hours did you spend per week doing your own personal development during this time? (Please complete the sentence below)

The initial set-up took approximately ☐ weeks to complete,

and I spent apprioxmately ☐ hours each week during the time.

3b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

4a. After the initial set-up of the Maths Champions programme, how many hours did you spend per week doing your own personal development for the programme? (Please state)

☐ hours

4b. Was this mostly at work or in your own time? (Please circle one)

Work *Own time*

5. How much support did you feel you received from your setting's Maths Champion during the initial set-up of the programme? (Please circle one)

Very supported *Supported* *Somewhat supported* *Not at all supported*

6. After the initial set-up of the programme, how much support did you receive from your setting's Maths Champion? (Please circle one)

Very supported *Supported* *Somewhat supported* *Not at all supported*

7. Did you have access to the online Maths Champions resource bank?

Yes *No*

If *yes*, please continue to question 8. If *no*, how did your nursery's Maths Champion inform you of the resources so that you could implement them in your group?

8. Do you think that the Maths Champions activities from the resource bank were appropriately pitched for use with children aged 3-4 years old? (Please circle one)

Completely appropriate *Mostly appropriate* *Somewhat appropriate* *Not at all appropriate*

9. Were the Maths Champions materials easy for you to understand? (Please circle one)

Yes, all of them *Most of them* *Some of them* *None of them*

10. Did you request any additional support or resources to help you implement the Maths Champions in your group? (Please describe)

11. What were the challenges/barriers, if any, to using the Maths Champions programme within your nursery setting? (Please explain)

12. What impact, if any, do you think the Maths Champions programme has had on your own practice within the nursery? (Please describe)

13. What impact, if any, do you think the Maths Champions programme has had on children's development in your nursery? (Please describe)

14. What impact, if any, do you think the Maths Champions programme has had on general nursery practice? (Please describe)

15. If you did, please describe how you included parents/carers in the Maths Champions programme (Please describe)

16. What impact, if any, do you think the Maths Champions programme has had on the maths activities parents/carers do with their children? (Please describe)

17. Would you recommend the Maths Champions programme to other nurseries? (Please circle one)

Yes, definitely *Probably* *Probably not* *No, definitely not*

Please explain your answer below:

Thank you very much for completing the questionnaire.

Please give this completed survey to the lead Maths Champion within your nursery who will return it to the research team.

If you have any further questions or comments please get in touch by emailing: MathsChampionsEvaluation@cem.dur.ac.uk or calling Sarah Hallett, Project's researcher administrator, on: 0191 334 4197.

PARTICIPANT INFORMATION SHEET

MATHS CHAMPIONS RESEARCH PROJECT – CASE STUDY INTERVIEW

You have been asked to participate in a short interview to help us understand your experience of the Maths Champions Programme in your nursery setting. Please read this form carefully and ask any questions you may have before agreeing to be in the study.

The purpose of this interview is to review the Maths Champions Programme in practice and obtain a more rounded perspective of the programme within your nursery setting, explore how the programme is used and adapted, including any barriers that you may have faced.

If you agree to be take part in the interview, you will be asked to answer a number of questions relating to your experience of the Maths Champions Programme in your nursery. The interview will take place in your nursery, with a member of the research team and should last no longer than 30 minutes. A recording device will be used to ensure accuracy of our records. Your name, age, job title and contact details will be recorded for research purposes only. The recording of the interview will be kept until the interview is transcribed, after which it will be destroyed.

All responses you give or other data collected will be kept confidential. The records of this study will be kept secure and private. All files containing any information you give are password protected. In any research report that may be published, no information will be included that will make it possible to identify you individually. There will be no way to connect your name to your responses at any time during or after the study.

You are free to decide whether or not to participate. If you decide to participate, you are free to withdraw at any time without any negative consequences for you.

The evaluation of the Maths Champions programme is being delivered by a team led by Professor David Torgerson at the University of York in collaboration with Dr Lyn Robinson at the Centre for Evaluation and Monitoring at Durham University.

If you have any questions, requests or concerns regarding this research, please contact Gemma Stone at gemma.stone@cem.dur.ac.uk or by telephone at 0191 334 4177.

The Evaluation of the Maths Champions Programme has been reviewed and approved by the School of Education Ethics Sub-Committee at Durham University (date of approval:16/03/16).

Yours sincerely,

Dr Lyn Robinson
Research Associate, CEM
Tel: 0191 334 4197
Email: mathschampionsevaluation@cem.dur.ac.uk

DECLARATION OF INFORMED CONSENT

- I agree to participate in this interview, the purpose of which is to review the Maths Champions Programme in practice.
- I have read the participant information sheet and understand the information provided.
- I have been informed that I may decline to answer any questions or withdraw from the study without penalty of any kind.
- I have been informed that data collection will involve the use of recording devices.
- I have been informed that all of my responses will be kept confidential and secure, and that I will not be identified in any report or other publication resulting from this research.
- I have been informed that the investigator will answer any questions regarding the study and its procedures. Dr Lyn Robinson, Centre for Evaluation and Monitoring (CEM), Durham University can be contacted via email: lyn.robinson@cem.dur.ac.uk or by telephone at 0191 334 4197.
- I will be provided with a copy of this form for my records.

Any ethical concerns about this study should be addressed to the School of Education Ethics Sub-Committee, Durham University via email to ed.ethics@durham.ac.uk.

Date Participant Name (please print) Participant Signature

I certify that I have presented the above information to the participant and secured his or her consent.

Date Signature of Investigator

NDNA Group Interview – beginning of main trial

Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.
- Encourage any questions from NDNA team about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Changes made to the Maths Champions programme for the trial

- Can you describe anything that is different in the Maths Champions programme for delivery this year in the trial compared to how it was delivered before?
    - Have any new aspects been added in?
    - Have you taken anything out?

  Prompt through different aspects listed below:

    - Programme access via website
    - Induction process
    - Initial audits
    - BKSB programme
    - Online courses for Maths Champions
    - Online courses for Practitioners
    - Creating action plans
    - Maths Resources and the layout of these (previously discussed this as a way Oxford can help)
    - Webinars (timing and content)
    - Ongoing support from NDNA
    - End of the programme audits
    - Action research – was this in the original version?

- What changes have been made as a result of the review of the programme by the Oxford team?
    - Was this due to feedback from nurseries that took part in the programme previously?
    - Was this due to Oxford's evidence based review of the programme?

- Have you made any changes to the way the Maths Champions programme is being delivered just to suit the research trial?
    - *Prompt: E.*g. Changes to timelines, length of intervention delivery, what you are asking nurseries to do, pupil assessment (induction mentioned that this was different), delivery areas (more deprived here?), target grouping (only private nurseries)

- Are/were there any aspects of the programme that you would like to change but haven't been able to?

Initial Response of Maths Champions Nurseries

- What has been the initial response of the nurseries taking part in the programme this year?
- How far through the steps of the programme are most nurseries currently?
- Which aspects are most likely to hold up a nursery proceeding through the programme? / What aspects of the programme do you feel you need to provide the most support for?
- How are you/do you plan to follow up nurseries that aren't making the expect progress through the steps?
- What, if any, reservations do nurseries have about the programme at the early stages?
- Have all nurseries involved (that have completed their assessments) had an induction session now?
    - Roughly, what percentage of induction sessions were done face to face compared to via webinar?
    - What would you prefer to do? Do you feel there are any key differences between them?

Barriers to Maths Champions delivery

- Do you feel there have been any barriers to the programme being delivered as you would have wanted (in an ideal world)?
    - If so, what are these?
- What barriers are nurseries flagging up as possible issues going forward?
    - Staffing concerns?
    - Technology?
    - Time?
- What issues do you expect nurseries to experience in delivery of the project through the year – from previous experience?
- Have you had any feedback from Maths Champions about the reaction from the rest of the staff?

Expected impact of the programme (if time to explore)

We would like to explore the changes that you expect the programme to have on nurseries so that we can try to capture these during our case studies.

- What do you feel are the key changes you would expect to see in nurseries taking part in the programme?
    - Staff confidence?

- Practice?
- Relationship with parents?
- Number and quality of maths activities
- Maths activities more incorporated through the nursery day

Maths Champion Interview

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Background

- Can you tell us a bit about your background?
  - How long you have worked at the nursery?
  - How long have you worked within nursery settings generally?
  - What is your prior experience with maths?
    - Qualifications
    - enjoyment/dislike
- How confident do you feel in your own maths skills?
- How confident do you feel currently in being able to support early year's maths skills?

Professional Development Opportunities

- Do you have access to other professional development opportunities within the nursery?
  - What kind of format do these take?
    - One day courses/in the nursery/online courses?
  - Have you done anything similar to the Maths Champions programme?

Current Nursery Maths Practice

- Can you describe what normal maths practice would be in the nursery?
- How would maths teaching normally be incorporated into the nursery?
  - Prompt – resources, play activities (inside/outside), standalone/incorporated into tasks
  - Who would currently plan the maths activities in the nurseries?
    - MC/staff in each room/other?

The Maths Champions Programme

- Why did you sign up to the Maths Champions programme?
  - Was it your decision to sign up?
  - If not, did you volunteer for the Maths Champion role?

- What do you hope to get out of the programme?
    - Personally
    - Other nursery staff
    - Children
    - Parents
    - Other?
- How do you plan to monitor if the programme has worked?
    - What would you expect to change?
    - What will you use as success criteria for you?

Initial Maths Champions Set-Up

- How far through the Initial Maths Champions set-up process are you?
    - On track to have completed step 3 by the end of the week?
- What are your initial thoughts about the Maths Champions programme at this stage?
    - What do you like about the programme so far? All
    - Is there anything you don't like or that you are worried about? All
- How are you finding the initial Maths Champions set-up process? All
    - Audits/training courses/webinars/phone calls with NDNA
- What aspects of the Maths Champions programme (if any) have been most useful during the set-up period?
    - Was there anything that hasn't been useful?
- Have you set up an action plan yet for the nursery?
    - What does this involve? What are you aiming to improve?
- How engaged are the staff you are working with in the Maths Champions programme?
- How do you access the Maths Champions programme?
    - work/home, own computer, nursery computer
- When do you access the programme?
    - Do you have time during the working day?
- What support if any have you had from NDNA (Jo or Fiona)? *Prompt, phone calls, induction etc.*
    - Face to face induction or webinar?
- Do you feel the amount of support is about right? (more or less and why?)
    - Is there anything missing at this stage in terms of support that would be useful?

Barriers to completing the programme

- What do you think will be the barriers or challenges to implementing the programme during the year? - all

Costs of the programme

- How much time did the set-up training/steps take for you to complete?
- How much time has it taken for the practitioners to complete the initial set-up steps?
- Has any additional cover had to be provided to enable you to complete aspects of the Maths Champions programme so far?

- Do you expect to have to pay for staff cover during the programme as a result of the programme requirements?
- Do you anticipate there being any additional costs e.g. new resources necessary to implement the programme? Ldshp/MC

Parental Engagement (if time)

How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?

Do you plan to use the Maths Champions resources to engage with parents?

<u>Nursery Manager Interview</u>

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

The Maths Champions Programme

- Why did you sign the nursery up to the Maths Champions programme?
- Was there any specific reason you selected _____ as the Maths Champion for the setting?
- What do you hope the programme will achieve?
    - Nursery staff
    - Children
    - Parents?
    - Setting overall?
- How do you plan to monitor if the programme has worked?
    - What would you expect to change?
    - What will you use as success criteria for you?

Current Nursery Maths Practice

- How would maths teaching normally be incorporated into the nursery?
    - Prompt – resources, play activities (inside/outside), standalone/incorporated into tasks
- Are there any policies or practice about the amount of maths time done?
- How would day to day maths activities normally be planned?
    - By room staff, by senior staff, on the day/in advance

Staff professional development opportunities

- What other professional development opportunities do staff have in this nursery? (Leadership)
    - What sort of focus would these have?
        - Developmental/Procedural (e.g. child protection, hygiene)/Activities
- Is the Maths Champions programme similar to any other PD programme you have done previously?

Initial Maths Champions Set-up

- What are your initial thoughts about the Maths Champions programme now you have started?
    - What do you like about the programme so far?
    - Is there anything you don't like about or that you are worried about?
- How have you found the initial Maths Champions set-up process?
    - Audits/training courses/webinars/phone calls with NDNA
- Have you had much input into the set up stage? (e.g. support with audits, creation of nursery action plans)
- How engaged are your staff in the Maths Champions programme at this stage?
- Are staff given time during the work day to engage with the programme or do they do this in their own time?

Cost of the programme

Although the programme is being provided for free we are interested to find out if using the programme has any additional costs for nurseries.

- Have you had to provide any additional cover for staff so far to fulfil the Maths Champions requirements?
- Do you expect to have to pay for staff cover at any time during the programme?
- Do you anticipate there being any additional costs e.g. new resources necessary to implement the programme? Ldshp/MC

Support from NDNA

- Do you feel the level of support provided by NDNA been appropriate to support your setting accessing the programme?
    - If not, would less or more be better?
    - What support would help?

<u>Practitioner Interview</u>

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Background

- Can you tell us a bit about your background?
    - How long you have worked at the nursery?
    - How long have you worked within nursery settings generally?
    - What is your prior experience with maths?
        - Qualifications
        - enjoyment/dislike
- How confident do you feel in your own maths skills?
- How confident do you feel currently in being able to support early year's maths skills?

Professional Development Opportunities

- Do you have access to other professional development opportunities within the nursery?
    - What kind of format do these take?
        - One day courses/in the nursery/online courses?
    - Have you done anything similar to the Maths Champions programme?

Current Nursery Maths Practice

- Can you describe what normal maths practice would be in the nursery?
- How would maths teaching normally be incorporated into the nursery?
    - *Prompt* – resources, play activities (inside/outside), standalone/incorporated into tasks
    - Who would currently plan the maths activities in the nurseries?
        - MC/staff in each room/other?
    - Would you normally deliver maths activities?

Maths Champions Programme

- What do you currently know about the Maths Champion programme?
- Have you been involved in any of the set-up stages for the Maths Champions programme?
    - Confidence audits, other audits, BKSB
- Do you think that the Maths Champions programme will have any benefits:
    - For you?
    - For the children?
    - For the nursery?
- Is there anything about the Maths Champions programme that worries you or that you think will be a challenge?

Maths Champion | Mid-point Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Heading the Maths Champions Programme

- How have you found implementing the programme to date?
- What were you initial thoughts on the quality of the resources, once you gained access to them?
- How frequently are you accessing the MC website?
- How much time do you find you spend daily or weekly on the MC programme?
    - Preparing for
- Are you finding the workload associated with the MC programme manageable?
- Have you attended the webinars? How useful have you found them?
    - Maths in Early Years, Let's Look at Number, Let's look at Shape, Space and Measure' (may not have completed yet).
- What aspects of the MC programme (if any) have been the most useful so far?
    - Was there anything that hasn't been useful?
- How do you access the programme, when you are at work?
    - Prompt – work/home, own computer, nursery computer
- Are you using/interacting with the MC FB page?

Disseminating the MC programme to staff

- How have you gone about disseminating the MC programme and resources to the staff within your nursery?
- How engaged are the staff in the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme during the year?

Nursery Maths Practice

- How closely are you following the action plan you developed at the beginning of the programme?
- How often are you incorporating the MC resources into teaching within a normal day within the nursery? Any examples?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Who plans the maths activities? Has this changed since implementing the MC programme?
    - Prompts: MC/ staff in room/other?
- Do you find that you delivering more maths activities since starting the programme?

- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Monitoring Success

- Do you think that the MC programme is having any benefits:
    - For you?
    - For the children?
    - For the nursery?
- Are you monitoring success from the MC programme?
- Have you seen any indicators that would suggest success?

Support from NDNA

- Do you feel the level of support provided by NDNA been appropriate to support your setting accessing the programme?
    - If not, would less or more be better?
    - What support would help?

Costs of the Programme

- Has any additional cover had to be provided to enable you to complete aspects of the Maths Champions programme so far?
- Have you had to pay for staff cover during the programme as a result of the programme requirements?
- Have there been any additional costs e.g. new resources necessary to implement the programme?

Parental Engagement (if time)

- How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?
    - Do you plan to use the Maths Champions resources to engage with parents?

Manager/Leadership | Mid-point Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.
-

Maths Champions Programme

- What are your thoughts about the Maths Champions programme now it is ongoing?
    - What do you like about the programme?
    - Is there anything you don't like about or that you are worried about?
- How did you find the initial Maths Champions set-up process?

    - Audits/training courses/webinars/phone calls with NDNA
- Have you had much input into rolling the MC programme out? (e.g. webinars, training, resources, accessing website)
- How engaged are your staff in the Maths Champions programme at this stage?
- Are staff given time during the work day to engage with the programme or do they do this in their own time?
- What kind of support, if any, have you had to provide the MC/practitioners to implement the MC programme?

Current Nursery Maths Practice

- How would maths teaching now incorporated into the nursery? Has this changed since implementing the MC programme?
    - Prompt – resources, play activities (inside/outside), standalone/incorporated into tasks
- Are there any policies or practice about the amount of maths time done?
- How would day to day maths activities normally be planned, has this changed since implementing the MC programme?
    - By room staff, by senior staff, on the day/in advance

Monitoring Success

- Have you seen any indicators that would suggest success?
- Are you monitoring success from the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme during the year?

Cost of the programme

Although the programme is being provided for free we are interested to find out if using the programme has any additional costs for nurseries.

- Have you had to provide any additional cover for staff so far to fulfil the Maths Champions requirements?
- Have you had to pay for staff cover at any time during the programme so far?
- Have there being any additional costs so far e.g. new resources necessary to implement the programme?

Practitioner | Mid-Point Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.

- Encourage any questions from interviewee about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Maths Champions Programme

- What do you currently know about the Maths Champion programme?
- How is the MC disseminated to you by the MC within your nursery?
- Do you have access to the online resources?
    - What are your thoughts on the quality of the teaching resources?
- Have you attended any of the NDNA webinars? How useful have you found them?
    - Maths in Early Years, Let's Look at Number, Let's look at Shape, Space and Measure' (may not have completed yet).
- How have you found implementing the programme/resources/new knowledge to date?
- Is there anything about the Maths Champions programme that has worried you or that has been a challenge?
- Do you have access to the MC FB page? If so, are you using/interacting with it?
- How much time do you find you spend daily or weekly on the MC programme?
- Do you think that the MC programme is having any benefits:
    - For you?
    - For the children?
    - For the nursery?

Nursery Maths Practice

- Can you describe what normal maths practice is within the nursery? Has this changed since starting the MC programme? If so, is this for better or worse?
- Have you incorporated the online MC resources into teaching within a normal day? Any examples? Have you had to adapt any to fit your own environment?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Who plans the maths activities?
    - Prompts: MC/ staff in room/other?
- Do you find that you delivering more maths activities since starting the programme?
- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Project Delivery Team Interview (End of Trial)

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.
- Encourage any questions from NDNA about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Reflecting on the Theory of Change model

Q. Looking at the ToC model that was developed at the beginning of the pilot, is there anything that you would update in light of the experience of the project?

Changes made to the MC programme for the pilot study

Q. Can you describe anything that is different in the MC programme for delivery this year in the trial compared to how it was delivered before?

- *Prompts: Did you add any new aspects in? Did you take anything out?*
- *Prompt: E.*g. *Changes to timelines, length of intervention delivery, what you are asking nurseries to do, target audience, delivery areas (more deprived here?), target grouping.*

Delivering the MC programme

Q. With regards to the delivery of the MC programme, what do you feel has gone well?

Q. Was the MC programme delivered to nurseries (by NDNA) and within nurseries (by practitioners) as you expected it to be?

Q. Do you feel there have been any barriers to the programme being delivered as you intended? If so, what are these? How could they be addressed in the future?

Q. Did nurseries report any problems in implementing the programme?

- *Prompt: E.g. Staffing concerns? Technology?*

Q. Have you had any feedback from MC leads about the reaction from the rest of the staff/children/parents to the programme?

Impact of the programme

What do you feel have been the key changes in nurseries that have taken part in the programme?

- Staff confidence?
- Practice?
- Relationship with parents?
- Number and quality of maths activities
- Maths activities more incorporated through the nursery day

Cost of delivering the MC progamme

Q. What were the main costs associated with delivering the programme within each nursery?

- *Prompt: e.g. staff time, travel, materials, anything else?*

Q. Were you aware of any direct costs/expense(s) to the nurseries for delivering the MC programme within the trial?

Q. What is the cost to schools who want to deliver the MC programme in the future? Please consider this within context of what it has cost the main trial to deliver within each school.

The future of MC programme

Q. Are you aware of any changes that you feel need to be made to the MC programme model? And were any changes made during the course of delivering the intervention?

- *What were they and why? What impact did these changes have?*

Q. What impact would suggested changes for the future have on the cost of implementation of the programme?

- Prompt: E.g. practitioner training/delivery and training materials.

Q. What are your future plans for the MC programme?

Exit Point Interview Schedule | Maths Champion

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Heading the Maths Champions Programme

- How have you found implementing the programme? Have you enjoyed it, has it been challenging?
- Did you make use of the resources? If so, what were your thoughts on the quality of the resources?
- Did the frequency with which you accessed the MC website change over the course of project?
- How much time did you spend daily or weekly on the MC programme?
    - Preparing for it
    - Delivering it
- Did you find the workload associated with the MC programme manageable?
- Did you attend the webinars? How useful did you find them?
- What aspects of the MC programme (if any) were the most useful?

- Was there anything that wasn't useful?

Disseminating the MC programme to staff

- How have you gone about disseminating the MC programme and resources to the staff within your nursery?
- How engaged are the staff in the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme?

Nursery Maths Practice

- How closely did you follow the action plan you developed at the beginning of the programme?
- How often are you incorporating the MC resources into teaching within a normal day within the nursery? Any examples?
  - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Do you find that you are delivering more maths activities since starting the programme?
- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Monitoring Success

- Do you think that the MC programme is having any benefits:
  - For you?
  - For the children?
  - For the nursery?

Support from NDNA

- Do you feel the level of support provided by NDNA been appropriate to support your setting accessing the programme?
  - If not, would less or more be better?
  - What support would help?

Costs of the Programme

- Has any additional cover had to be provided to enable you to complete aspects of the Maths Champions programme so far?
- Have you had to pay for staff cover during the programme as a result of the programme requirements?
- Have there been any additional costs e.g. new resources necessary to implement the programme?

Parental Engagement (if time)

- How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?

Exit Point Interview Schedule | Manager or Leadership

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.

Disseminating the MC programme to staff

- How have you gone about disseminating the MC programme and resources to the staff within your nursery?
- How engaged are the staff in the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme?

Nursery Maths Practice

- How closely did you follow the action plan you developed at the beginning of the programme?
- How often are you incorporating the MC resources into teaching within a normal day within the nursery? Any examples?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Do you find that you are delivering more maths activities since starting the programme?
- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Monitoring Success

- Do you think that the MC programme is having any benefits:
    - For you?
    - For the children?
    - For the nursery?

Support from NDNA

- Do you feel the level of support provided by NDNA been appropriate to support your setting accessing the programme?
    - If not, would less or more be better?
    - What support would help?

Costs of the Programme

- Has any additional cover had to be provided to enable you to complete aspects of the Maths Champions programme so far?
- Have you had to pay for staff cover during the programme as a result of the programme requirements?
- Have there been any additional costs e.g. new resources necessary to implement the programme?

Parental Engagement (if time)

- How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?

Exit Point Interview Schedule | Practitioner

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.

The Maths Champions Programme

- How have you found doing the programme? Have you enjoyed it, has it been challenging?
- How engaged have you been in the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme?

Nursery Maths Practice

- How closely did you follow the action plan you developed at the beginning of the programme?
- How often are you incorporating the MC resources into teaching within a normal day within the nursery? Any examples?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Do you find that you are delivering more maths activities since starting the programme?
- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Monitoring Success

- Do you think that the MC programme is having any benefits:
    - For you?
    - For the children?
    - For the nursery?

Support from NDNA

- Do you feel the level of support provided by NDNA been appropriate to support your setting accessing the programme?
    - If not, would less or more be better?
    - What support would help?

Costs of the Programme

- Has any additional cover had to be provided to enable you to complete aspects of the Maths Champions programme so far?
- Have there been any additional costs e.g. new resources necessary to implement the programme?

Parental Engagement (if time)

- How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?

Maths Champion | Best Practice Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.
- Big congratulations on being selected as a 'Best Practice' nursery!

Heading the Maths Champions Programme

- How have you found implementing the programme? Have you enjoyed it, has it been challenging?
- How much time did you find you spend daily or weekly on the MC programme?
    - Preparing for it
    - Delivering it
- Did you find the workload associated with the MC programme manageable?
- What aspects of the MC programme (if any) have been the most useful?
    - Was there anything that hasn't been useful?

Disseminating the MC programme to staff

- How have you gone about disseminating the MC programme and resources to the staff within your nursery?
- How engaged are the staff in the MC programme?

Barriers to Completing the Programme

- Have you experienced any barriers or challenges to implementing the programme during the year?

Nursery Maths Practice

- How closely are you following the action plan you developed at the beginning of the programme?
- How often are you incorporating the MC resources into teaching within a normal day within the nursery? Any examples?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Who plans the maths activities? Has this changed since implementing the MC programme?
    - Prompts: MC/ staff in room/other?
- Do you find that you delivering more maths activities since starting the programme?
- Are you feeling more or less confident are in your own maths skills since starting the MC programme?

Monitoring Success

- Do you think that the MC programme is having any benefits:

    - For you?
    - For the children?
    - For the nursery?
- Did you monitor the success of the programme at all? If so, how?
- You've been selected as a Best Practice nursery. Do you have any thoughts on why you might have been selected, what you are doing well?

Parental Engagement (if time)

- How engaged are parents generally with nursery staff and in particular with their child's learning at nursery?
    - Do you plan to use the Maths Champions resources to engage with parents?

Best Practice Manager/Leadership | Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that they don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process.
- Explain that we would like to record the interview and get verbal consent to do this before starting.
- Big congratulations on being selected as a 'Best Practice' nursery!

Maths Champions Programme

- What are your thoughts about the Maths Champions programme?
    - What do you like about the programme?
    - Is there anything you don't like about or that you found difficult?
- Have you had much input into rolling the MC programme out? (e.g. webinars, training, resources, accessing website)
- How engaged were your staff in the Maths Champions programme?
- Were staff given time during the work day to engage with the programme or did they do this in their own time?
- What kind of support, if any, have you had to provide the MC/practitioners to implement the MC programme?

Current Nursery Maths Practice

- How is maths teaching incorporated into the nursery? Has this changed since implementing the MC programme?
    - Prompt – resources, play activities (inside/outside), standalone/incorporated into tasks
- Are there any policies or practice about the amount of maths time done?
- How would day to day maths activities normally be planned, and has this changed since implementing the MC programme?
    - By room staff, by senior staff, on the day/in advance

Best Practice

- You've been selected as a Best Practice nursery. Do you have any thoughts on why you might have been selected, what you are doing well?
- What sort of impact do you think the MC programme has had on
    - Your staff?
    - The children who received it?
- Did you monitor the impact that the programme was having during the project? If so, how?

Barriers to Completing the Programme

Have you experienced any barriers or challenges to implementing the programme during the year?

Practitioner | Best Practice Interview Schedule

Introduction

- Brief on purpose of the interview in terms of the evaluation.
- Explain that any questions that people don't want to answer just say so and we will skip on.
- Encourage any questions from interviewee about the interview and the process
- Explain that we would like to record the interview and get verbal consent to do this before starting.
- Big congratulations on being selected as a 'Best Practice' nursery!

Maths Champions Programme

- Can you describe your experience of Maths Champions
    - How is the MC disseminated to you by the MC within your nursery?
    - How have you been using it within your daily practice?
- Did you access the online resources?
    - What are your thoughts on the quality of the teaching resources?
- Have you attended any of the NDNA webinars? How useful have you found them?
    - Maths in Early Years, Let's Look at Number, Let's look at Shape, Space and Measure' (may not have completed yet).
- How have you found implementing the programme/resources/new knowledge to date?
- Is there anything about the Maths Champions programme that has worried you or that has been a challenge?
- Do you have access to the MC FB page? If so, are you using/interacting with it?
- How much time did you find you spent daily or weekly on the MC programme?
- Do you think that the MC programme had any benefits:
    - For you?
    - For the children?
    - For the nursery?

Nursery Maths Practice

- Can you describe what normal maths practice is within the nursery? Has this changed since starting the MC programme? If so, is this for better or worse?

- Have you incorporated the online MC resources into teaching within a normal day? Any examples? Have you had to adapt any to fit your own environment?
    - Prompt: resources, play activities (inside/outside), standalone/incorporated into tasks
- Do you find that you delivering more maths activities since starting the programme?
- Are you feeling more or less confident in your own maths skills since starting the MC programme?
- You've been selected as a Best Practice nursery. Do you have any thoughts on why you might have been selected, what you are doing well?

Appendix Y: Maths Champion Post Intervention Survey

Question 1. 'How useful did you find the following aspects of the Maths Champion programme? (n = 38)					
Aspect of programme	**Usefulness rating**				
	Very useful	Quite useful	Somewhat useful	Not at all useful	Didn't complete/blank
E-Safety Training	15	12	5	0	6
Initial Settings Audit	26	8	2	1	1
Staff Confidence Audit	20	13	4	0	1
BKSB Initial Assessment	8	11	8	6	5
BKSB Activities	9	9	3	7	10
Online Training Courses	23	9	5	1	0
Monthly Webinars	22	3	7	1	5
Resource Bank	27	7	3	0	1
NDNA Setting-specific support	20	8	4	0	6

Question 2: How useful did you find the following training courses? (n = 38)					
Training course	**Usefulness rating**				
	Very useful	Quite useful	Somewhat useful	Not at all useful	Didn't complete/blank
Train the Trainer	24	6	3	0	5
Evaluating your Practice and Impact Measurement	24	7	3	0	4
Maths in the Early Years	26	9	0	1	2
Let's look at Number	28	7	0	1	2

Let's Look at Shape, Space and Measure	27	7	0	1	3

Question 3. Do you think that the Maths Champions activities from the resource bank were appropriately pitched for use with children aged 3-4 years old? (n = 38)	
Level of appropriateness	**No. of respondents**
Completely appropriate	17
Mostly appropriate	21
Somewhat appropriate	0
Not at all appropriate	0
Didn't complete question	0

Question 4. Were the Maths Champions materials easy for you to understand? (n = 38)	
Agreement	**No. of respondents**
Yes, all of them	23
Most of them	14
Some of them	1
None of them	0
Didn't complete question	0

Question 6a. How many hours did you spend per week doing your own personal development for the initial set-up of the Maths Champions programme? (n = 38)	
Time taken (weeks)	**Number of respondents**

0-1.5	7
2-4	18
5-10	11
>10	0
Didn't complete question	2

Question 6b. Was this mostly in work or in your own time? (n = 38)	
When Champions worked	**No. of respondents**
Work	19
Own time	19
Both	0
Didn't complete question	0

Question 7a. After initial set-up of the Maths Champions Programme, how many hours did you spend per week doing your own personal development for the programme? (n = 38)	
Time taken (hours)	**No. of respondents**
0-1.5	8
2-4	24
5-10	4
>10	1
Didn't complete question	1

Question 7b. Was this mostly at work or in your own time? (n = 38)	
When Champions worked	**No. of respondents**
Work	22

Own time	16
Both	0

Question 8. During the initial set-up of the Maths Champions in your setting, how often were you able to provide support to your Maths Champions team? (n = 38)	
Frequency of support	**No. of respondents**
At least once a week	11
2 to 3 times a month	11
Once a month	10
Less than once a month	6

Question 9. After the initial set-up, how often were you able to provide support to your Maths Champions team?	
Frequency of support	**No. of respondents**
At least once a week	10
2 to 3 times a month	11
Once a month	9
Less than once a month	6
Didn't complete question	2

Question 10. Did you use the Maths Champions programme for the full year? (n =38)	
Was MC programme used for full year?	**No. of respondents**
Yes	34
No	4

Question 11. How engaged were your team at the start of the Maths Champions Programme? (n = 38)	
Level of engagement	**No. of respondents**
Very engaged	9
Quite engaged	14
Engaged for some parts	11
Not at all engaged	3
Quite engaged/Engaged for some parts	1

Question 12. How engaged were your team throughout the Maths Champions Programme? (n = 38)	
Level of engagement	**No. of respondents**
Very engaged	8
Quite engaged	19
Engaged for some parts	8
Not at all engaged	2
Quite engaged/Engaged for some parts	1

Question 18. Would you recommend the Maths Champions Programme to other nurseries? (n = 38)	
Likelihood of recommendation	**No. of respondents**
Yes, definitely	29
Probably	9
Probably not	0

No, definitely not	0

Appendix Z Practitioner post intervention survey findings

Question 1. 'How useful did you find the following aspects of the Maths Champion programme? (n = 76)					
Aspect of training	**Usefulness rating**				
	Very useful	Quite useful	Somewhat useful	Not at all useful	Didn't complete/blank
E-safety training	19	24	8	0	25
Initial Settings Audits	25	29	6	1	15
Staff Confidence Audit	24	37	4	2	9
BKSB (GCSE) assessments	12	26	5	11	22
BKSB (GCSE) module activities	14	25	4	8	25
Online Training Courses	27	31	5	0	13
Monthly Webinars	15	18	10	2	31
Online Resource Bank	29	25	4	3	15
NDNA setting - specific support	20	27	6	1	22

Question 2: How useful did you find the following training courses?
(n = 76)

Training course	Usefulness rating				
	Very useful	Quite useful	Somewhat useful	Not at all useful	Didn't complete/blank
Maths in Early Years	39	22	2	0	13
Let's Look at number	33	24	5	0	14
Let's look at shape, space and measure	36	22	4	0	14

Question 3a.1 The initial set up [of Maths Champions] took _ weeks to complete
(n = 76)

Time taken (weeks)	Number of respondents
0-1	3
2-4	29
5-10	11
>10	5
Didn't complete question	28

Question 3a.2 I spent approximately _ hours each week [on the initial setup]
(n = 76)

Time taken (hours)	No. of respondents
0-1.5	14
2-4	28
5-10	7
Didn't complete question	27

Question 3b. Was this mostly in work or in your own time? (n = 76)	
When practitioners worked	**No. of respondents**
Work	46
Own time	14
Both	4
Didn't complete question	12

Question 4a. After initial set-up of the Maths Champions Programme, how many hours did you spend per week doing your own personal development for the programme? (n = 76)	
Time taken (hours)	**No. of respondents**
0-1.5	24
2-4	33
>4	3
Didn't complete question	16

Question 4b. Was this mostly at work or in your own time? (n = 76)	
When practitioners worked	**No. of respondents**
Work	44
Own time	17
Both	3

Didn't complete question	12

Question 5. How much support did you feel you received from your setting's Maths Champion during the initial setup? (n = 76)	
Amount of support	**No. of respondents**
Very supported	39
Supported	31
Somewhat supported	1
Didn't complete question	5

Question 6. After the initial set-up, how much support did you feel you received from your setting's Maths Champion? (n = 76)	
Amount of support	**No. of respondents**
Very supported	41
Supported	27
Somewhat supported	1
Didn't complete question	7

Question 7. Did you have access to the online Maths Champion resource bank? (n=76)	
Access to resources	**No. of respondents**
No	10
Yes	63
Didn't complete question	3

Question 8. Do you think that the Maths Champions activities from the resource bank were appropriately pitched for use with children aged 3-4 years old?

(n = 76)	
Level of appropriateness	**No. of respondents**
Completely appropriate	36
Mostly appropriate	34
Somewhat appropriate	0
Not at all appropriate	0
Didn't complete question	10

Question 9. Were the Maths Champions materials easy for you to understand? (n = 76)	
Agreement	**No. of respondents**
Yes, all of them	31
Most of them	34
Some of them	2
None of them	0
Didn't complete question	7

Appendix AA: Practitioner Confidence Survey Results

Table 1. Responses to subscale 1 of the Practitioner Confidence Survey by randomised group for all respondents

Your Beliefs about Nursery Aged Children and Maths items	Response	Intervention group (n=118)	Control group (n=154)	Total (n=272)
Most children in my group enter nursery with little maths knowledge	Strongly disagree	2 (1.7)	7 (4.6)	9 (3.4)
	Disagree	47 (40.9)	63 (41.4)	110 (41.2)
	Neither agree nor disagree	42 (36.5)	54 (35.5)	96 (36.0)
	Agree	22 (19.1)	27 (17.8)	49 (18.4)
	Strongly agree	2 (1.7)	1 (0.7)	3 (1.1)
Most children in my group have the cognitive abilities to learn maths	Strongly disagree	1 (0.9)	1 (0.7)	2 (0.7)
	Disagree	1 (0.9)	2 (1.3)	3 (1.1)
	Neither agree nor disagree	8 (6.9)	13 (8.6)	21 (7.9)
	Agree	86 (74.1)	111 (73.5)	197 (73.8)
	Strongly agree	20 (17.2)	24 (15.9)	44 (16.5)
Most children in my group should be helped to learn maths in nursery	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	2 (1.3)	2 (0.7)
	Neither agree nor disagree	8 (6.9)	11 (7.2)	19 (7.1)
	Agree	54 (46.6)	66 (43.4)	120 (44.8)
	Strongly agree	54 (46.6)	72 (47.4)	126 (47)
Most children in my group are very interested in learning maths	Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Disagree	8 (6.8)	12 (7.8)	20 (7.4)
	Neither agree nor disagree	28 (23.9)	52 (34)	80 (29.6)
	Agree	68 (58.1)	69 (45.1)	137 (50.7)
	Strongly agree	13 (11.1)	20 (13.1)	33 (12.2)

Most children in my group need to learn maths in nursery to be ready for school	Strongly disagree	1 (0.9)	1 (0.7)	2 (0.7)
	Disagree	2 (1.7)	8 (5.3)	10 (3.7)
	Neither agree nor disagree	23 (19.8)	30 (19.9)	53 (19.9)
	Agree	52 (44.8)	67 (44.4)	119 (44.6)
	Strongly agree	38 (32.8)	45 (29.8)	83 (31.1)
Most children in my group learn a great deal about maths through their everyday activities	Strongly disagree	0 (0.0)	2 (1.3)	2 (0.7)
	Disagree	0 (0.0)	2 (1.3)	2 (0.7)
	Neither agree nor disagree	7 (5.9)	3 (2.0)	10 (3.7)
	Agree	48 (40.7)	76 (49.7)	124 (45.8)
	Strongly agree	63 (53.4)	70 (45.8)	133 (49.1)
Most children in my group need structured maths instruction in nursery	Strongly disagree	10 (8.6)	11 (7.2)	21 (7.8)
	Disagree	40 (34.5)	51 (33.6)	91 (34.0)
	Neither agree nor disagree	43 (37.1)	51 (33.6)	94 (35.1)
	Agree	21 (18.1)	32 (21.1)	53 (19.8)
	Strongly agree	2 (1.7)	7 (4.6)	9 (3.4)
Most children in my group should be helped to learn maths using a published maths curriculum (for example EYFS)	Strongly disagree	20 (17.2)	36 (24.2)	56 (21.1)
	Disagree	59 (50.9)	69 (46.3)	128 (48.3)
	Neither agree nor disagree	34 (29.3)	27 (18.1)	61 (2.03)
	Agree	2 (1.7)	14 (9.4)	16 (6.0)
	Strongly agree	1 (0.9)	3 (2.0)	4 (1.5)

Table 2. Responses to subscale 1 of the Practitioner Confidence Survey for identified Maths Champions only

Your Beliefs about Nursery Aged Children and Maths items	**Response**	**Intervention group (n=30)**
Most children in my group enter nursery with little maths knowledge	Strongly disagree	0 (0.0)
	Disagree	10 (33.3)

	Neither agree nor disagree	11 (36.7)
	Agree	9 (30.0)
	Strongly agree	0 (0.0)
Most children in my group have the cognitive abilities to learn maths	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	3 (10.3)
	Agree	18 (62.1)
	Strongly agree	8 (27.6)
Most children in my group should be helped to learn maths in nursery	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	2 (6.9)
	Agree	14 (48.3)
	Strongly agree	13 (44.8)
Most children in my group are very interested in learning maths	Strongly disagree	0 (0.0)
	Disagree	2 (6.9)
	Neither agree nor disagree	4 (13.8)
	Agree	17 (58.6)
	Strongly agree	6 (20.7)
Most children in my group need to learn maths in nursery to be ready for school	Strongly disagree	1 (3.4)
	Disagree	0 (0.0)
	Neither agree nor disagree	6 (20.7)
	Agree	13 (44.8)
	Strongly agree	9 (31.0)
Most children in my group learn a great deal about maths through their everyday activities	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	1 (3.3)

	Agree	7 (23.3)
	Strongly agree	22 (73.3)
Most children in my group need structured maths instruction in nursery	Strongly disagree	2 (6.7)
	Disagree	7 (23.3)
	Neither agree nor disagree	11 (36.7)
	Agree	8 (26.7)
	Strongly agree	2 (6.7)
Most children in my group should be helped to learn maths using a published maths curriculum (for example EYFS)	Strongly disagree	5 (16.7)
	Disagree	16 (53.3)
	Neither agree nor disagree	8 (26.7)
	Agree	0 (0.0)
	Strongly agree	1 (3.3)

Table 3. Responses to subscale 2 of the Practitioner Confidence Survey by randomised group for all respondents

Your Confidence in Helping Nursery Aged Children Learn Maths items	**Response**	**Intervention group (n=118)**	**Control group (n=154)**	**Total (n=272)**
I am confident in my knowledge of what the children in my classroom know about maths when they enter nursery	Strongly disagree	1 (0.8)	0 (0.0)	1 (0.4)
	Disagree	2 (1.7)	5 (3.3)	7 (2.6)
	Neither agree nor disagree	13 (11.0)	23 (15)	36 (13.3)
	Agree	78 (66.1)	103 (67.3)	181 (66.8)
	Strongly agree	24 (20.3)	22 (14.4)	46 (17.0)
I am confident in my knowledge of reasonable maths goals for nursery aged children	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Neither agree nor disagree	0 (0.0)	6 (3.9)	6 (2.2)
	Agree	80 (69.0)	100 (65.4)	180 (66.9)
	Strongly agree	36 (31.0)	45 (29.4)	81 (30.1)

I am confident in my knowledge of the best practices and strategies for helping nursery aged children learn maths	Strongly disagree	0 (0.0)	2 (1.3)	2 (0.7)
	Disagree	0 (0.0)	2 (1.3)	2 (0.7)
	Neither agree nor disagree	8 (6.8)	17 (11.1)	25 (9.2)
	Agree	78 (66.1)	99 (64.7)	177 (65.3)
	Strongly agree	32 (27.1)	33 (21.6)	65 (24)
I am confident in my knowledge of local or national maths standards for nursery aged children (for example, EYFS and EYFS profile results)	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	2 (1.7)	3 (2.0)	5 (1.8)
	Neither agree nor disagree	10 (8.5)	13 (8.5)	23 (8.5)
	Agree	68 (57.6)	86 (56.2)	154 (56.8)
	Strongly agree	38 (32.2)	50 (32.7)	88 (32.5)
I am confident in my knowledge of the best ways to assess children's maths knowledge and understanding throughout the year	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Neither agree nor disagree	11 (9.3)	15 (9.8)	26 (9.6)
	Agree	74 (62.7)	101 (66)	175 (64.6)
	Strongly agree	33 (28.0)	36 (23.5)	69 (25.5)
I am confident in my ability to observe what nursery aged children know about maths	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Neither agree nor disagree	4 (3.4)	4 (2.6)	8 (3.0)
	Agree	66 (55.9)	97 (63.8)	163 (60.4)
	Strongly agree	48 (40.7)	50 (32.9)	98 (36.3)
I am confident in my ability to incorporate maths learning into common nursery situations (such as art or dramatic play)	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Neither agree nor disagree	3 (2.5)	6 (3.9)	9 (3.3)
	Agree	61 (51.7)	91 (59.9)	152 (56.3)
	Strongly agree	54 (45.8)	54 (35.5)	108 (40.0)
	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)

I am confident in my ability to plan activities to help nursery aged children learn maths	Disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Neither agree nor disagree	2 (1.7)	4 (2.6)	6 (2.2)
	Agree	54 (45.8)	87 (57.6)	141 (52.4)
	Strongly agree	62 (52.5)	58 (38.4)	120 (44.6)
I am confident in my ability to further children's maths knowledge when they make spontaneous maths comments/ discoveries	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Neither agree nor disagree	1 (0.8)	0 (0.0)	1 (0.4)
	Agree	58 (49.2)	81 (54)	139 (51.9)
	Strongly agree	59 (50)	68 (45.3)	127 (47.4)
I am confident in my ability to make sense of children's' confusions when they learn maths	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Neither agree nor disagree	9 (7.6)	14 (9.4)	23 (8.6)
	Agree	70 (59.3)	97 (65.1)	167 (62.5)
	Strongly agree	39 (33.1)	36 (24.2)	75 (28.1)
I am confident in my ability to translate assessments into curriculum plans (i.e. turning assessments of children into next steps for learning)	Strongly disagree	0 (0.0)	1 (0.7)	1 (0.4)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Neither agree nor disagree	5 (4.3)	15 (10.0)	20 (7.5)
	Agree	70 (59.8)	86 (57.3)	156 (58.4)
	Strongly agree	42 (35.9)	48 (32.0)	90 (33.7)

Table 4. Responses to subscale 2 of the Practitioner Confidence Survey for identified Maths Champions only

Your Confidence in Helping Nursery Aged Children Learn Maths items	**Response**	**Intervention group (n=30)**
I am confident in my knowledge of what the children in my classroom know about maths when they enter nursery	Strongly disagree	1 (3.3)
	Disagree	2 (6.7)
	Neither agree nor disagree	3 (10.0)

	Agree	16 (53.3)
	Strongly agree	8 (26.7)
I am confident in my knowledge of reasonable maths goals for nursery aged children	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	16 (55.2)
	Strongly agree	13 (44.8)
I am confident in my knowledge of the best practices and strategies for helping nursery aged children learn maths	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	17 (56.7)
	Strongly agree	13 (43.3)
I am confident in my knowledge of local or national maths standards for nursery aged children (for example, EYFS and EYFS profile results)	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	14 (46.7)
	Strongly agree	16 (53.3)
I am confident in my knowledge of the best ways to assess children's maths knowledge and understanding throughout the year	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	2 (6.7)
	Agree	14 (46.7)
	Strongly agree	14 (46.7)
I am confident in my ability to observe what nursery aged children know about maths	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	1 (3.3)
	Agree	13 (43.3)

	Strongly agree	16 (53.3)
I am confident in my ability to incorporate maths learning into common nursery situations (such as art or dramatic play)	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	9 (30.0)
	Strongly agree	21 (70.0)
I am confident in my ability to plan activities to help nursery aged children learn maths	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	9 (30.0)
	Strongly agree	21 (70.0)
I am confident in my ability to further children's maths knowledge when they make spontaneous maths comments/ discoveries	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	12 (40.0)
	Strongly agree	18 (60.0)
I am confident in my ability to make sense of children's' confusions when they learn maths	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	1 (3.3)
	Agree	15 (50.0)
	Strongly agree	14 (46.7)
I am confident in my ability to translate assessments into curriculum plans (i.e. turning assessments of children into next steps for learning)	Strongly disagree	0 (0.0)
	Disagree	0 (0.0)
	Neither agree nor disagree	0 (0.0)
	Agree	15 (50.0)
	Strongly agree	15 (50.0)

Table 5. Responses to subscale 3 of the Practitioner Confidence Survey by randomised group for all respondents

Your Confidence in your own Math Abilities	**Response**	**Intervention group (n=118)**	**Control group (n=154)**	**Total (n=272)**
Maths was one of my best subjects in school	Strongly disagree	17 (14.4)	32 (21.1)	49 (18.1)
	Disagree	40 (33.9)	50 (32.9)	90 (33.3)
	Neither agree nor disagree	28 (23.7)	35 (23.0)	63 (23.3)
	Agree	22 (18.6)	21 (13.8)	43 (15.9)
	Strongly agree	11 (9.3)	14 (9.2)	25 (9.3)
Just the word “maths” can make me feel nervous	Strongly disagree	6 (5.1)	10 (6.6)	16 (5.9)
	Disagree	14 (11.9)	27 (17.8)	41 (15.2)
	Neither agree nor disagree	39 (33.1)	43 (28.3)	82 (30.4)
	Agree	44 (37.3)	42 (27.6)	86 (31.9)
	Strongly agree	15 (12.7)	30 (19.7)	45 (16.7)
I’m not a “maths person”	Strongly disagree	8 (6.8)	14 (9.5)	22 (8.3)
	Disagree	29 (24.6)	42 (28.4)	71 (26.7)
	Neither agree nor disagree	39 (33.1)	47 (31.8)	86 (32.3)
	Agree	31 (26.3)	27 (18.2)	58 (21.8)
	Strongly agree	11 (9.3)	18 (12.2)	29 (10.9)
I can easily rotate objects in my mind	Strongly disagree	4 (3.4)	4 (2.6)	8 (3.0)
	Disagree	11 (9.3)	15 (9.9)	26 (9.6)
	Neither agree nor disagree	22 (18.6)	30 (19.7)	52 (19.3)
	Agree	67 (56.8)	87 (57.2)	154 (57.0)
	Strongly agree	14 (11.9)	16 (10.5)	30 (11.1)
I like coming up with creative ways to solve maths problems	Strongly disagree	1 (0.8)	8 (5.3)	9 (3.3)
	Disagree	18 (15.3)	19 (12.5)	37 (13.7)
	Neither agree nor disagree	41 (34.7)	47 (30.9)	88 (32.6)

	Agree	47 (39.8)	64 (42.1)	111 (41.1)
	Strongly agree	11 (9.3)	14 (9.2)	25 (9.3)
I can easily convert fractions into percentages	Strongly disagree	16 (13.7)	21 (13.9)	37 (13.8)
	Disagree	28 (23.9)	44 (29.1)	72 (26.9)
	Neither agree nor disagree	28 (23.9)	32 (21.2)	60 (22.4)
	Agree	38 (32.5)	47 (31.1)	85 (31.7)
	Strongly agree	7 (6.0)	7 (4.6)	14 (5.2)
I have a bad sense of direction	Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Disagree	21 (18.4)	23 (16.4)	44 (17.3)
	Neither agree nor disagree	20 (17.5)	26 (18.6)	46 (18.1)
	Agree	53 (46.5)	61 (43.6)	114 (44.9)
	Strongly agree	20 (17.5)	30 (21.4)	50 (19.7)
I'm good at looking at numeric data and finding patterns	Strongly disagree	2 (1.7)	12 (7.9)	14 (5.2)
	Disagree	19 (16.1)	26 (17.2)	45 (16.7)
	Neither agree nor disagree	39 (33.1)	51 (33.8)	90 (33.5)
	Agree	46 (39.0)	56 (37.1)	102 (37.9)
	Strongly agree	12 (10.2)	6 (4.0)	18 (6.7)
I'm good at estimating how tall something is or the distance between two locations	Strongly disagree	5 (4.2)	10 (6.6)	15 (5.6)
	Disagree	28 (23.7)	39 (25.7)	67 (24.8)
	Neither agree nor disagree	35 (29.7)	48 (31.6)	83 (30.7)
	Agree	43 (36.4)	49 (32.2)	92 (34.1)
	Strongly agree	7 (5.9)	6 (3.9)	13 (4.8)

Table 6. Responses to subscale 3 of the Practitioner Confidence Survey for identified Maths Champions only

Your Confidence in your own Math Abilities	**Response**	**Intervention group** **(n=30)**

Maths was one of my best subjects in school	Strongly disagree	3 (10.0)
	Disagree	13 (43.3)
	Neither agree nor disagree	3 (10.0)
	Agree	5 (16.7)
	Strongly agree	6 (20.0)
Just the word “maths” can make me feel nervous	Strongly disagree	0 (0.0)
	Disagree	5 (16.7)
	Neither agree nor disagree	12 (40.0)
	Agree	6 (20.0)
	Strongly agree	7 (23.3)
I’m not a “maths person”	Strongly disagree	0 (0.0)
	Disagree	6 (20.0)
	Neither agree nor disagree	10 (33.3)
	Agree	8 (26.7)
	Strongly agree	6 (20.0)
I can easily rotate objects in my mind	Strongly disagree	1 (3.3)
	Disagree	4 (13.3)
	Neither agree nor disagree	4 (13.3)
	Agree	17 (56.7)
	Strongly agree	4 (13.3)
I like coming up with creative ways to solve maths problems	Strongly disagree	0 (0.0)
	Disagree	4 (13.3)
	Neither agree nor disagree	10 (33.3)
	Agree	12 (40.0)
	Strongly agree	4 (13.3)
	Strongly disagree	2 (6.9)

I can easily convert fractions into percentages	Disagree	7 (24.1)
	Neither agree nor disagree	5 (17.2)
	Agree	13 (44.8)
	Strongly agree	2 (6.9)
I have a bad sense of direction	Strongly disagree	0 (0.0)
	Disagree	4 (13.3)
	Neither agree nor disagree	4 (13.3)
	Agree	17 (56.7)
	Strongly agree	5 (16.7)
I'm good at looking at numeric data and finding patterns	Strongly disagree	0 (0.0)
	Disagree	6 (20.0)
	Neither agree nor disagree	5 (16.7)
	Agree	16 (53.3)
	Strongly agree	3 (10.0)
I'm good at estimating how tall something is or the distance between two locations	Strongly disagree	1 (3.3)
	Disagree	6 (20.0)
	Neither agree nor disagree	11 (36.7)
	Agree	12 (40.0)
	Strongly agree	0 (0.0)

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