

# Trial Evaluation Protocol

## [Same Day Intervention]

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<b>PROJECT TITLE</b>	Same Day Intervention
<b>DEVELOPER (INSTITUTION)</b>	Outwood
<b>EVALUATOR (INSTITUTION)</b>	Natcen
<b>PRINCIPAL INVESTIGATOR(S)</b>	Daniel Phillips
<b>PROTOCOL AUTHOR(S)</b>	Malen Davies, Daniel Phillips, Anysia Nguyen, Robert Wishart
<b>TRIAL DESIGN</b>	Two-arm cluster randomised controlled efficacy trial with random allocation at school level
<b>PUPIL AGE RANGE AND KEY STAGE</b>	Year 5, ages 9-10
<b>NUMBER OF SCHOOLS</b>	73
<b>NUMBER OF PUPILS</b>	c. 3,900
<b>PRIMARY OUTCOME</b>	GL Pupil achievement in maths assessment (Progress Test in Maths)
<b>SECONDARY OUTCOME</b>	Teacher workload

## Protocol version history

VERSION	DATE	REASON FOR REVISION
1.2 [ <i>latest</i> ]		
1.1		
1.0 [ <i>original</i> ]		<i>[leave blank for the original version]</i>

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## Intervention

The intervention being evaluated is Same Day Intervention (SDI). It provides targeted support so that all pupils attain a given level of mathematics understanding and thus prevents an achievement gap from emerging. SDI entails teachers and teaching assistants (TAs) receiving training, observing 'open classroom' sessions and receiving other support and access to teaching resources. Training and support to implement the SDI programme will be delivered by the Yorkshire and the Humber Maths Hub.

SDI classes are taught daily in place of traditional mathematics classes. Teachers demonstrate a topic, before pupils are given five or six diagnostic questions to complete independently. There is then approximately 15 minutes 'pit stop', during which teachers mark pupils' work, and pupils either attend a short assembly or are led in an activity by a TA. After the break, pupils are grouped according to their diagnostic activity performance and there is an intervention session designed to target pupils who need extra teaching, address common misconceptions and embed learning. Intermediate objectives are to improve attitudinal outcomes for pupils and teachers and reduce teacher workload. Ultimately, the programme is designed to increase pupils' maths attainment and reduce the achievement gap between poorest and highest performing students. The evaluation uses a randomised controlled trial (RCT) design with schools randomised to one of two conditions:

1. Intervention (schools will implement SDI)
2. Control (schools will not implement SDI and carry on with business as usual)

### Why: theory/rationale

SDI aims to ensure all pupils have grasped the key elements of a topic by the end of a class. This is influenced by the successful Shanghai model of education<sup>1</sup>. Maths lessons include a 'progress pit-stop' placed in the middle of it, during which teachers can assess and group children by a diagnostic activity performance. Such separation allows teachers to identify pupils with misconceptions and address them in order to reduce the learning gap. The programme's theory of change can be found in Appendix 1.

### What: Physical or informational materials used in the intervention

Teachers can source or write their own diagnostic questions and mark students' work according to a marking code which has been developed by the Yorkshire and the Humber Maths Hub. The marking code, a bank of questions and exemplar lesson resources are provided during training and made available online and on google classroom/Padlet<sup>2</sup>.

### What: Procedures, activities and/or processes used in the intervention

SDI aims to improve outcomes for children in mathematics. It involves restructuring maths lessons. Participating schools adhere to the following structure:

- Whole class input – high quality teaching, supported by Assessment for Learning strategies; scaffolding and differentiated questioning within the input (approximately 30 minutes and to include the diagnostic task).
- Complete diagnostic task – 5 to 6 carefully crafted questions that are completed independently by students and marked by the teacher.
- Marking time – the 'progress pit-stop' (15 minutes): The teacher marks pupils' work, and pupils are placed into one of two groups, based on achievement: (Group one) pupils who grasped the concept; (Group two) pupils who have not yet achieved the lesson outcome.
- SDI Time (approximately 30 minutes) – those in Group one will complete further reasoning and problem-solving work using independent worksheets with exercises designed to

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<sup>1</sup> McGarry, B. (2017) Same Day Intervention. 2016-17 Report. Maths Hubs. Yorkshire and the Humber.

<sup>2</sup> A platform used to deposit lesson resources

deepen and master the topic, supervised by the TA. Those in Group two will be taught by the teacher who will ensure scaffolding towards independence takes place. This will ensure students can grasp the concept by the end of the lesson and prevent a learning gap from forming daily. They can move on to the deepening work if they grasp the concept sooner.

### **Who: Intervention providers/implementers**

Teachers will implement the intervention and, where possible, teaching assistants will be trained to support. In addition, the Senior Leadership Team will create the structural change to the school day as needed.

### **How: Mode of delivery**

This intervention happens within the normal class setting, with a change to the timetable structure such that the teacher can be free for 15 minutes in order to mark and assess. Therefore the whole SDI classes are longer than usual, taking place over 75 minutes. This also means a change to the way a TA works with the class (supporting the children who have grasped the concept being taught and possibly leading a session for the whole class during the progress pit-stop).

### **Where: Location of the intervention**

Primary schools in Yorkshire and the Humber and surrounding areas (e.g. Lincolnshire, Derbyshire, and North West i.e. Oldham).

### **When and how much: Duration and dosage of the intervention**

Same Day Intervention will take place over approximately seven months and during regular maths classes. Classes last 75 minutes, including the 15-minute 'progress pit-stop'.

### **Tailoring**

The 'progress pit-stop' is non-negotiable. It is encouraged that teachers are released for this time by assemblies, although participating schools are welcome to change this if needed in order to allow interventions to take place (using TAs or pupil led activities). Teachers may plan from their own scheme of work using their own lessons but must follow the ethos of SDI through an appropriately paced scheme of work. In order to provide the progress pit-stop, classes will need the support of a TA.

## **Study rationale and background**

The MathsHubs were launched in 2014, and part of this was the DfE led Shanghai-England exchange where English maths teachers researched how and why the Shanghai teachers taught in a particular way. Shanghai currently tops the international maths league table published by the OECD, while the UK is in 26th position<sup>3</sup>. The Shanghai approach on which SDI is based, focuses on depth rather than breadth. It makes incremental progress, ensuring the class moves together as one, and aims to go over concepts until they are truly understood by everyone. Teachers use Same Day Intervention to ensure that gaps do not form.

SDI has been shown to be feasible, having been implemented in several schools both within the Outwood Trust and beyond, through Yorkshire and Humber Maths Hub. However, there is little programme level evidence regarding SDI. An evaluation of a pilot by McGarry (2017) explored programme implementation and perceived success in the UK<sup>4</sup>, but impact evaluation exploring SDI's effectiveness has so far been small-scale and without a control group, with results therefore only

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<sup>3</sup> <https://www.theguardian.com/education/2015/nov/26/shanghai-teaching-method-could-improve-uk-results-within-four-years>

<sup>4</sup> McGarry, B. (2017) Same Day Intervention. 2016-17 Report. Maths Hubs. Yorkshire and the Humber.

providing anecdotal evidence. This evaluation of SDI aims to provide robust evidence of whether the programme has an impact on Year 5 pupils' maths attainment and teacher workload.

## Impact Evaluation

### Research questions

The evaluation of Same Day Intervention aims to answer the following principal research questions:

- **Primary:** What is the impact of SDI on maths attainment of Year 5 pupils in England and how does it differ by FSM eligibility?
- **Secondary:** To what extent does participation in SDI affect teachers' workload?
- **Secondary:** To what extent does participation in SDI affect teacher perception regarding students' confidence in maths?
- **Additional analysis:** What is the impact of SDI on the size of the gap between higher achieving and lower achieving Year 5 pupils?

### Design

The evaluation will be conducted as a two-arm cluster (school-level) randomised controlled trial of the effect of Same Day Intervention on the maths attainment of students in Year 5.

A randomised controlled trial (RCT) uses the mechanism of randomisation to assess the causal impact of an intervention. Random assignment of schools to treatment and control groups ensures that, in principle, the two groups have the same baseline characteristics. Any differences at baseline are due to chance and are accounted for in the statistical analysis. As a result, any discrepancy in outcomes at the end of the trial can be attributed to the intervention itself. As an efficacy trial, the evaluation aims to test the effect of the intervention in ideal circumstances. The primary outcome of interest is maths attainment as measured by GL's Progress Test in Maths<sup>5</sup> and the secondary outcomes are teacher self-reported workload and teachers' perceptions of pupil confidence, as measured by a teacher survey<sup>6</sup>.

Schools assigned to the control condition implement a business-as-usual approach to teaching maths to Year 5 pupils and may choose to offer participation in Same Day Intervention in the following academic year. An incentive of £1,000 is being offered to all control schools to participate in the trial. The incentive is intended to mitigate the risk that schools are approached about the trial but choose instead not to participate once assigned to the control group.

Schools will be required to provide background information on all Year 5 pupils in academic year 2018-19. This will include the Unique Pupil Number (UPN), date of birth, first name and surname. This pupil information is collected in an Excel spreadsheet template and uploaded by schools using a secure NatCen website.

<b>Trial type and number of arms</b>	Two-arm cluster randomised controlled trial with random allocation at school level and stratification at regional hub level
<b>Unit of randomisation</b>	School

<sup>5</sup> <https://www.gl-assessment.co.uk/media/2308/glassessment-ptm.pdf>

<sup>6</sup> Questions in the teacher survey were developed with reference to question phrasing in the teacher workload survey, see, Higon, J., Leonardi, S., Choudhoury, A., Richards, N., Owen, D., & Sofroniou, N. (2017). Teacher workload survey 2016.

<b>Stratification variables</b> (if applicable)		Regional hub
<b>Primary outcome</b>	variable	Year 5 student Maths attainment
	measure (instrument, scale)	GL's Progress Test in Maths
<b>Secondary outcome(s)</b>	variable(s)	Teacher workload, teachers' perceptions of pupil confidence
	measure(s) (instrument, scale)	Teacher survey

## Randomisation

Schools agreeing to participate in the trial will be allocated to one of the two groups using stratified randomisation by three regional hubs with a 50:50 ratio between treatment and control. This stratification will help control for possible differences between regions in terms of school characteristics and programme implementation and thus decrease the variance of the impact estimator. It will also allow the delivery team to deliver in roughly equal geographical hubs. Randomisation will be undertaken in Stata and both *do* and *log* files will be used to record the randomisation process. At time of randomisation, analysts will be blinded to school identity. School identifiers will then be merged with group allocation data after randomisation.

## Participants

Schools were judged eligible to take part if they met the following criteria:

- i. Location – schools had to be based in Yorkshire and Humber and surrounding areas.
- ii. Number of classes per school – schools should have at least one class of Year 5 students. Mixed year-group classes are not eligible.
- iii. SDI involvement – eligible schools could not have been involved in any SDI projects previously, though they could have employed other Shanghai methodologies or been involved in a Maths Hub project
- iv. Mainstream non-selective and non-special schools

All students in Year 5 classes of schools that met the criteria above were eligible.

Schools were recruited by the Yorkshire and the Humber Maths Hub<sup>7</sup>. They were drawn from the population of schools in Yorkshire and the Humber and surrounding areas. The Yorkshire and Humber Maths Hub undertook a number of information sessions in the local area to showcase the intervention and trial. Marketing material was also developed this included a dedicated webpage and leaflet. The webpage allowed schools to submit their interest in the trial and these schools were followed up and sent a Memorandum of Understanding (MOU) to be signed by headteachers, the Yorkshire and the Humber Maths Hub and NatCen as part of the recruitment process. The MOU provided an overview of the intervention, detailed requirements for the three parties and collected consent to be involved in the study.

<sup>7</sup> The Yorkshire and Humber Maths Hub is led by Outwood trained teachers, headteachers and teaching assistants. It delivers Same Day Intervention training and provides support and access to teaching resources.

Once participating schools were identified, parents of Year 5 pupils were informed about schools' participation in the trial and programme through a letter from the school. The letter explained that access to the programme would be determined by lottery and provided the opportunity for parents to withdraw from having their child's data included in the analysis or any other aspects of the trial.

Students in Same Day Intervention schools were enumerated, and baseline data collected from schools in Summer 2018 prior to randomisation of schools. Baseline measures of prior attainment (KS1<sup>8</sup> and EYFSP<sup>9</sup> results) and ever FSM status will be obtained from the NPD records in 2019.

Baseline data from Year 5 teachers was collected between February and June 2018 through a self-completion survey and will be collected again in May/June 2019 at the end of the Same Day Intervention.

## Sample size calculations

		OVERALL	FSM
<b>MDES</b>		0.27	0.3
<b>Pre-test/ post-test correlations</b>	level 1 (pupil)	0.5	0.5
	level 2 (class)	0.0	0.0
	level 3 (school)	0.1	0.1
<b>Intracluster correlations (ICCs)</b>	level 2 (class)	0.05	0.05
	level 3 (school)	0.14	0.14
<b>Alpha</b>		0.05	0.05
<b>Power</b>		0.8	0.8
<b>One-sided or two-sided?</b>		2	2
<b>Average cluster (school) size*</b>		54	8**
<b>Number of schools</b>	Intervention	37	37
	Control	36	36
	<b>Total</b>	73	73
<b>Number of pupils</b>	Intervention	1,998	296**
	Control	1,944	288**
	<b>Total</b>	3,942	584**

\*We assume an average of two classes per school and 27 students per class. Figures based on data from Department for Education, Schools, Pupils and their Characteristics: January 2017 - National Tables

\*\*Proportion of FSM students anticipated to be national average for age-group of 14.4%, as in Department for Education, Schools, Pupils and their Characteristics: January 2018 - National Tables

Originally, the trial of the Same Day Intervention was intended to incorporate 120 schools. However, the Sample Size Calculations table above provides calculations for the trial with the 73 schools that were actually recruited to the Same Day Intervention trial. An alternative table in Appendix 1 sets out the same calculations, but with the originally intended sample of 120 schools.

Randomisation was stratified by regional hub to allow for regional differences in implementation and school characteristics. For education programmes, the variance explained by pre-test scores can be

<sup>8</sup> The KS1\_MATH\_OUTCOME variable will be used.

<sup>9</sup> The FSP\_MAT\_G11 and FSP\_MAT\_G12 variables will be used.

relatively high if pre-test scores are used in adjusted analysis<sup>10</sup>. Our pre- and post-test measures are informed by Torgerson and Torgerson (2013)<sup>11</sup>. School-level intra-cluster correlations (ICCs) are based on an EEF guidance note, using ICCs relating to Key Stage 2 Total Maths Scores for the North-West<sup>12</sup>, while class-level ICCs are expected to be smaller.

The calculations were undertaken using PowerUp! And indicate that this study is powered to detect an effect of 0.27 standard deviations based on the above assumptions.

## Outcome measures

The primary outcome measure is a standardised measure of maths knowledge, GL's Progress Test in Maths Level 10. The test assesses mathematical content knowledge and pupil understanding and application of mathematical processes through reasoning and problem solving. This will be administered in May/June 2019 to all pupils that signed up. Markers will be allocation blinded.

We have also provided an option for evaluating Same Day Intervention's long-term impact after the intervention is completed on Key Stage Two maths exams, which could be collected from the NPD in 2020 for this cohort as a post-test measure of attainment. If this option is pursued, then analysis of this follow-up outcome will be published as an addendum to the Same Day report.

Other secondary outcome measures will assess teacher outcomes in May/June 2019. The trial will examine impact on:

- Teacher workload
- Teacher perception regarding students' confidence in maths

Collection of teacher outcomes will take the form of a self-completion survey of Year 5 teachers participating in the trial across trial schools (in both trial arms) in Spring 2018 (prior to randomisation) and again in Summer 2019.

## Analysis plan

This is a two-arm trial and will compare outcomes for the Same Day Intervention (treatment group) with those from a group receiving business-as-usual maths classes (control).

The primary analysis will estimate the intervention's impact on maths attainment, as measured by GL's Progress Test in Maths (raw scores, in line with EEF analysis guidance<sup>13</sup>), using an intention-to-treat approach. The analysis will use analysis of co-variance (ANCOVA), a multi-level model accounting for baseline Key Stage 1 and EYFSP outcomes in Maths at pupil. Impact will be expressed as a standardised effect size using Hedge's *g* with 95% confidence intervals.

If differential loss to follow-up creates an imbalance between trial groups or if attrition is high, the sensitivity of the estimated effect will be assessed by approximating missing outcomes using multiple imputation.

A second sensitivity analysis will include a saturated model, including a wider range of prognostic covariates to increase power. Covariates will include pupil attainment, gender and age. All covariate data will be obtained from the National Pupil Database or publicly available data.

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<sup>10</sup> Bloom, Howard S., Lashawn Richburg-Hayes, and Alison Rebeck Black. 2007. 'Using Covariates to Improve Precision for Studies That Randomize Schools to Evaluate Educational Interventions'. *Educational Evaluation and Policy Analysis* 29 (1): 30–59.

<sup>11</sup> Torgerson and Torgerson, 2013. *Randomised trials in education: An introductory handbook*. EEF

<sup>12</sup> EEF, *Intra-cluster correlation coefficients*, 2015.

<sup>13</sup> EEF, 2018. *Statistical analysis guidance for EEF evaluations*



One subgroup analysis will be carried out. This will be considered indicative and no adjustment for multiple hypothesis testing will be made. The effect of the intervention on the primary outcome for FSM pupils will be calculated using a separate model (using EVERFSM from the NPD). In addition to the subgroup analysis, an appropriate statistical test of interaction will be used to assess whether there is a difference between FSM and non-FSM pupils. The 'ever FSM' indicator in the NPD (indicating whether pupils have ever been eligible for FSMs) will be used to conduct this analysis.

### Additional analysis

We will also undertake explorative analysis to understand the impact of Same Day on the attainment gap within classes. This will be done by graphically displaying the distributions of the outcome and conducting statistical tests to measure the dispersion of scores between the treated and control groups.

## Implementation and process evaluation

We will conduct an implementation and process evaluation (IPE) alongside the impact evaluation.

Research questions in relation to implementation and delivery are:

- a) How is the intervention been implemented and delivered across the range of delivery sites?
- b) To what extent does contextual variation affect fidelity? What adaptations are put in place?
- c) What are the barriers to delivery and how are these addressed by schools and trainers?
- d) What facilitates successful delivery?

Research questions in relation to the programme theory of change are:

- e) To what extent does participation in SDI affect teachers' confidence and workload?
- f) To what extent does participation in SDI affect pupils' attitudes towards maths, their confidence and self-efficacy?

## Methods

The IPE will sit alongside the impact evaluation and qualitative and quantitative methods used will provide an in-depth insight into how the intervention was put into practice, identifying the key factors that underpin outcomes identified as part of the impact evaluation. The table below provides a summary of how each implementation dimension will be addressed in the IPE, including which method will be used to assess how SDI has been implemented and delivered, which research questions the methods provide a response to and how the method will address these questions

Implementation dimension	Method	IPE research question	How will be addressed
Fidelity	Case studies – qualitative interviews with teachers and TAs  Telephone interview with developer	a and b	Here we will explore the Same Day Intervention training and whether and how teachers followed the five key elements of the SDI approach – teaching, diagnosing, marking pit stop, assistance of a TA and grouping <sup>14</sup> .  Here we will explore any insights the developer have on the extent to which

<sup>14</sup> See section of this protocol on *What: Procedures, activities and/or processes used in the intervention* for details

			intervention schools were able to follow the four phases of SDI.
Dosage	Pre and post intervention teacher survey	a, b and e	Teachers will be asked how often SDI approach was used in Maths classes throughout the 2018/19 academic year.  Teachers will be asked about confidence and workload in both pre and post surveys.
Quality	Case studies – focus groups with pupils	a, b and d	Pupils will be asked about experience of new model of maths lessons.
Reach	Post intervention teacher survey	c	A question in the post intervention survey will ask whether all pupils in each year 5 class were able to participate in SDI approach.
Responsiveness	Case studies – qualitative interviews with teachers and TAs and focus group with pupils	f	Teachers and TAs will be asked about pupils' ability to engage with SDI approach.  Pupils will be asked about their experience of the new model of teaching.
Programme differentiation	Case studies – qualitative interviews with teachers and TAs  Observations of training and twilight sessions	a, b and d	Teachers and TAs will be asked about any changes to the four phases of SDI and why these were implemented.  Observations will allow evaluators to explore any emerging differences in implementation

Details of each of the methods used in the IPE are outlined below.

### **Teacher and school survey (pre- and post-intervention)**

Before the intervention and randomisation, all schools in both treatment schools and control schools will complete an online survey. Pre-intervention surveys are completed by Year 5 teachers in the 2017/18 academic year. The survey will gather information on the school, pupils and teachers, including contextual information within which SDI is being delivered. It will also gather information on teacher workload in relation to maths, gathering information on time taken to plan and mark math lessons.

The post-intervention teacher survey will be aimed at all Year 5 teachers within the academic year 2018/19. The survey will gather up-to-date contextual information on the school, as well as up-to-date information on the workload of teachers in both treatment and control schools. In the treatment schools, the post-intervention survey will also examine fidelity to the intervention and adaptation.

The process evaluation will explore any changes in teacher practices and the teacher survey will enable us to explore time spent on marking.

### **Case studies at treatment schools**

Case studies will be conducted with ten treatment schools. The key purpose of the case studies is to gain an in-depth insight into implementation, exploring the factors that underpin successful delivery of the intervention, as well as barriers to delivery.

We will use a purposive sampling approach to select schools, to ensure there are a wide range of experiences and circumstances across the sample. The primary sampling criteria will include:

- **Number of year 5 classes in school** – ensuring the sample includes schools with varying numbers of year 5 classes

- **Experience of training** – ensuring the sample includes both schools who have experienced the full complement of training, as well as schools who missed some training dates
- **Hub location** – ensuring the sample includes schools from across the three hubs

Face-to-face interviews will be conducted with SDI teacher(s), SDI teaching assistant(s) and the head teacher in each case study school. The interviews will aim to gather in-depth information on school context, resource requirements, expected and perceived benefits of programme participation, implementation fidelity and whether there were any adaptations to the delivery of SDI and what these were and key delivery challenges and successes.

Small discussion groups with Year 5 pupils will also take place in case study schools. A group of between four to six pupils will be invited to participate in a group discussion which will explore pupils' views and experiences of the structure and content of their maths lessons and their attitude and confidence towards maths.

A total of five telephone interviews will be conducted with Year 5 teachers in control schools. These interviews will explore what business as usual looks like within control schools.

Each interview and discussion group will last approximately 45 minutes. With permission from participants all interviews and discussions will be recorded. All recordings will be managed using NatCen's Framework approach. This will involve managing interview data and conducting case-and-theme-based analysis. Key topics emerging from the transcripts will first be identified. A thematic framework will then be developed and used to organise the data from each participant. Then the coded data will be reviewed in detail, drawing out the range of experiences or views, identifying similarities and differences, developing and testing hypotheses, and interrogating data to seek to explain patterns and findings.

## Compliance

A measure of compliance will be constructed according to teacher and headteacher attendance to training and the extent of fidelity of implementation of key elements of the Same Day Intervention.

Attendance to training was identified in the Theory of Change (ToC) as a key element for the intervention. Teachers and Headteachers are required to attend training. Teachers are required to attend three full-day training sessions, whilst Headteachers are required to attend one full day of training. There are additional 'twilight' sessions which teachers can attend if they wish, but are not a compulsory part of the intervention. Therefore, the attendance element of compliance will not account for attendance to 'twilight' sessions but solely utilise attendance of teachers and headteachers to compulsory training.

Compliance in the intervention group will be determined at class-level. The attendance element of compliance will be constructed as follows:

- Classes taught by each teacher will be given one point for each of the three compulsory training sessions a teacher attended
- All classes in a school will be given an additional point if the headteacher attended training. In instances where another senior school staff member attends training on behalf of a headteacher, classes in the school will not be awarded this point.

The total score will then be divided by four to give the attendance element of compliance a possible range of  $0 \leq Comply_A \leq 1$ .

We will also construct an index capturing each of the elements of implementation fidelity outlined below, to be captured via the post-intervention survey of teachers.

an index

1. Use of Same Day Intervention pedagogical techniques to model new concepts at the start of each Same Day lesson
2. Use of a 'diagnostic' assessment to assess the learning of pupils
3. Re-structuring the maths lesson to an hour and fifteen minutes to incorporate a 'pitstop' for teachers to mark the diagnostic assessment
4. Availability of a Teaching Assistant for Same Day Intervention classes
5. Splitting the class into two-groups based on the results of the assessment, with the teacher teaching the group in need of more support and the teaching assistant working with the other group

This index will be re-scaled to have a range of  $0 \leq Comply_F \leq 1$  and combined with the attendance measure (with equal weighting placed on each element) to provide an overall measure of compliance with a range from zero to one.

In summary, compliance will be measured as a continuous variable derived from the measures of attendance and implementation fidelity set out above.

## Cost evaluation

Cost information will be collected through the process evaluation from all intervention schools. When evaluating the per pupil cost of the intervention the approach set out in EEF's published guidance will be followed. Calculating the average cost of delivery enables comparisons to be made with other interventions based on both the average effectiveness and costs incurred. The total cost per pupil will be calculated based on information provided by schools in the school post-intervention survey about direct and indirect costs incurred.

Costs that will be collected and reported in monetary terms include:

### Schools costs

#### Start-up costs (financial)

- Three days of training – teachers
  - Return travel per teacher
  - Course cost per teacher
- One day of training – head teachers
  - Return travel per teacher
  - Course cost per teacher
- Admin – timetabling adjustment/restructure of the school day by SLT so that maths lessons occur over break time/assembly
- Materials – new lesson plans, new teaching materials (e.g. PowerPoint slides, photocopying)

#### Start-up costs (time)

- Teaching supply cover (per teacher, per course attended)
- Time takes to arrange cover

#### Ongoing costs (time)

- Time spent accessing support e.g. via the online support the Yorkshire and Humber Math Hub project lead (Ben McGarry is setting up)
- Additional time spent planning lessons

### **Developers costs (financial and time)**

- Cost and time took to set up three all training events
- Cost and time of providing additional support to schools (e.g. online forum)

We will ask schools to provide cost information in the survey at the end of the school year. To help maximise response, we will ensure questions are kept as simple as possible. We will follow EEF guidance to calculate costs over three years<sup>15</sup> by calculating future costs for the programme (such as arranging for TAs to be present in Same Day Intervention classes) to cover a three-year total programme duration and dividing costs by three. We will also ask the developer about costs incurred at the end of the programme.

## **Ethics and registration**

### **Process for ethical approval**

NatCen has a robust ethics governance procedure. Research projects are scrutinised by the NatCen Research Ethics Committee (REC). The committee consists primarily of senior NatCen staff. If necessary external research experts or professional experts ('lay people') may also be invited to review individual studies. Depending on the nature of the research and the perceived level of risk, projects undergo either an expedited review (scrutiny by the REC Chair) or a full review by the sitting REC.

For this evaluation we believe that a full review is appropriate given the scale of the project, the range of research of tasks and the age of the children and young people involved. The REC procedure is designed to provide ethical advice and guidance, and to ensure that all research undertaken by NatCen is ethically sound and meets the ethical standards of government and other funders. The process provides reassurance to potential research participants and, where relevant, to gatekeepers through whom they are approached.

The REC has reviewed the design of this project, provided guidance that has been incorporated into this final protocol, and will continue to be involved on an ongoing basis. For example, the REC will review any changes to the study and consent and recruitment materials as they are developed.

### **Parental permissions**

Schools that sign an MoU sent out letters to parents/ carers of all Year 4 children who were due to be in Year 5 in 2018-19 school year. NatCen provided the letter electronically; schools printed the letter and sent it out. The letter explained that the school is taking part in the study and provided the parents with detailed information about the evaluation and offered them the opportunity to withdraw their children from the study. Specifically, the letter informed parents of the data collection and allowed them to opt out of data processing:

1. For the school to send data securely to NatCen. This will include their child's name, date of birth and their Unique Pupil Number.
2. To link their child's data to the National Pupil Database (NPD).
3. For their child to take part in a maths assessment in June/ July 2019.
4. For their child to take part in a student discussion group in May/ June 2019 (should they be invited to take part).

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<sup>15</sup> EEF Guidance on Cost Evaluation March 2016

5. For data from the NPD to be shared with NatCen and then stored in the Education Endowment Foundation's archive (which is managed by the Fischer Family Trust) and in anonymised form to the UK Data Archive.

NatCen provided clear instructions to schools to maintain a log of opt-outs, requests for which could be made using a return slip attached to the letter, by email or letter or verbally by speaking to a member of school staff. If parents/ carers opted their children out of the evaluation schools did not provide any information in the pupils' information form to NatCen.

## Data protection

NatCen has a range of policies and practices in place to ensure secure data handling. These are summarised below.

### GDPR

The National Centre for Social Research (NatCen) is the data controller and data processor for this project. This means that we are responsible for deciding the purpose and legal basis for processing data. From May 2018, under chapter 2, article 6 of the general data protection regulation<sup>16</sup>, the legal basis for processing data is 'legitimate interest'. A privacy notice was published on the study page on NatCen's website in May 2018 and subsequently issued to all schools. It can be found here: <http://www.natcen.ac.uk/taking-part/studies-in-field/evaluation-of-same-day-intervention/privacy-notice/>

All data collected for this study will be kept securely. We will safeguard the anonymity of all participants and no school, staff member or pupil will be named in any outputs or reports. School or pupils that decide that they no longer want to take part in the study may on request have their data deleted at any point and prior to the submission of a draft report to the EEF.

At the end of the research, all pupil data will be anonymised before being archived. Once the data is archived, EEF will take on the responsibility of data controller. All personal information, and any other data held on the project, will be securely deleted once the project is complete in July 2020.

Secure data handling NatCen has a range of policies and practices in place to ensure secure data handling. These are summarised below. We categorise all data and files to 5 different levels, dictating how they are stored, handled and transmitted. The sample data for this study is Level 3 - 'Respondent Confidential'. Only those who carry out research tasks and those who need to check or process the data will have access to names and addresses. Our confidentiality measures for Level 3 data include:

### Encryption

All staff and freelancer laptops that hold Level 3 respondent confidential data have a hard drive encrypted using PGP Whole Disk Encryption by Symantec. This means that should the laptop be lost or stolen, the data contained on the hard drive is inaccessible. The encryption used by PGP is certified to FIPS 140-2 standards. We also use encrypted digital recorders for qualitative interviews.

### Password Policy for office-based staff

- Complex passwords: change every 30 days
- 10 password history automatically enforced
- Account locked out after 5 wrong attempts

### Access control

- Access to project data is managed via compliant segregation
- Strict access control policy: limited to named authorised individuals

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<sup>16</sup> <https://eugdpr.org/>

- Unique serial numbers assigned to avoid use of personal information.

### Data Security Plans

- Project data security plan detailing data security procedures.
- Rights of access recorded before granted.

### File Systems Auditing

- File System Auditor used to monitor activities logging what was created, updated, moved, renamed and deleted and when.

NatCen processes for retention and destruction of personal data exceed ISO 20252 requirements on archiving and secure deletion.

## Personnel

### Project team at Yorkshire and the Humber Maths Hub:

The project is managed by an Education and Leadership Consultant in the Yorkshire and the Humber Maths Hub. The trial manager is Kathryn Greenhalgh (Executive Director of Maths) and assisted by Diane Heritage (Education Manager) and Ben McGarry (Project Officer).

### Evaluation team at NatCen:

The project is managed in the Evaluation team at NatCen. The trial was initially led by Rakhee Patel (Research Director) who left NatCen and was replaced by Daniel Phillips in May 2018. The project is managed in the Children and Families team at NatCen. The trial manager will be Daniel Phillips (Research Director), assisted by Malen Davies (Senior Researcher) and Robert Wishart (Senior Researcher – Analyst). Martina Vojtkova, Head of Evaluation at NatCen will provide quality assurance at design, analysis and reporting stages. Other members of the research team include Tanya Basi and Anysia Nguyen. The researchers will work closely with other departments and specialists at NatCen including the evaluation team, statisticians and the Operations Department.

## Risks

The main risks to the project are:

**Recruitment of schools and pupils.** Despite great efforts placed on recruitment, it was not possible to recruit the 120 schools originally planned to power the study. As agreed with EEF, NatCen have revised the IPE elements of the evaluation to ensure that they can provide in-depth information regarding key implementation and process dimensions.

**Non-participation in post-intervention pupil testing and teacher surveys, particularly among control schools (low/medium risk).** There is a risk that schools are unwilling to participate in the post-intervention research tasks. This will be addressed by setting out clearly the requirements for the trial in the MoU; timing payments of the £1,000 incentive for control schools to be paid on completion of the post-intervention research tasks; and providing schools with clear instructions at the start of the project on what needs to be done and when.

**High levels of opt-out (low/medium risk).** Parents will receive opt-out consent forms, and the evaluation team has assumed that only small numbers of families will return these forms based on other trial responses. However, it is possible that parents may not want their child to participate in the evaluation, or a large number of opt-out forms may be received within certain schools. This is not typically a problem in EEF trials, but the evaluation team will monitor this closely.

**Access to NPD data (low risk).** We will need to access NPD data for our baseline measures of student attainment and FSM eligibility. The new GDPR compliant procedures and processes that are being implemented by NPD and the Department of Education are likely to result in a delay in

obtaining an NPD data extract for conducting. The implications of this have been accounted for in the reporting milestones set out in the timetable below.

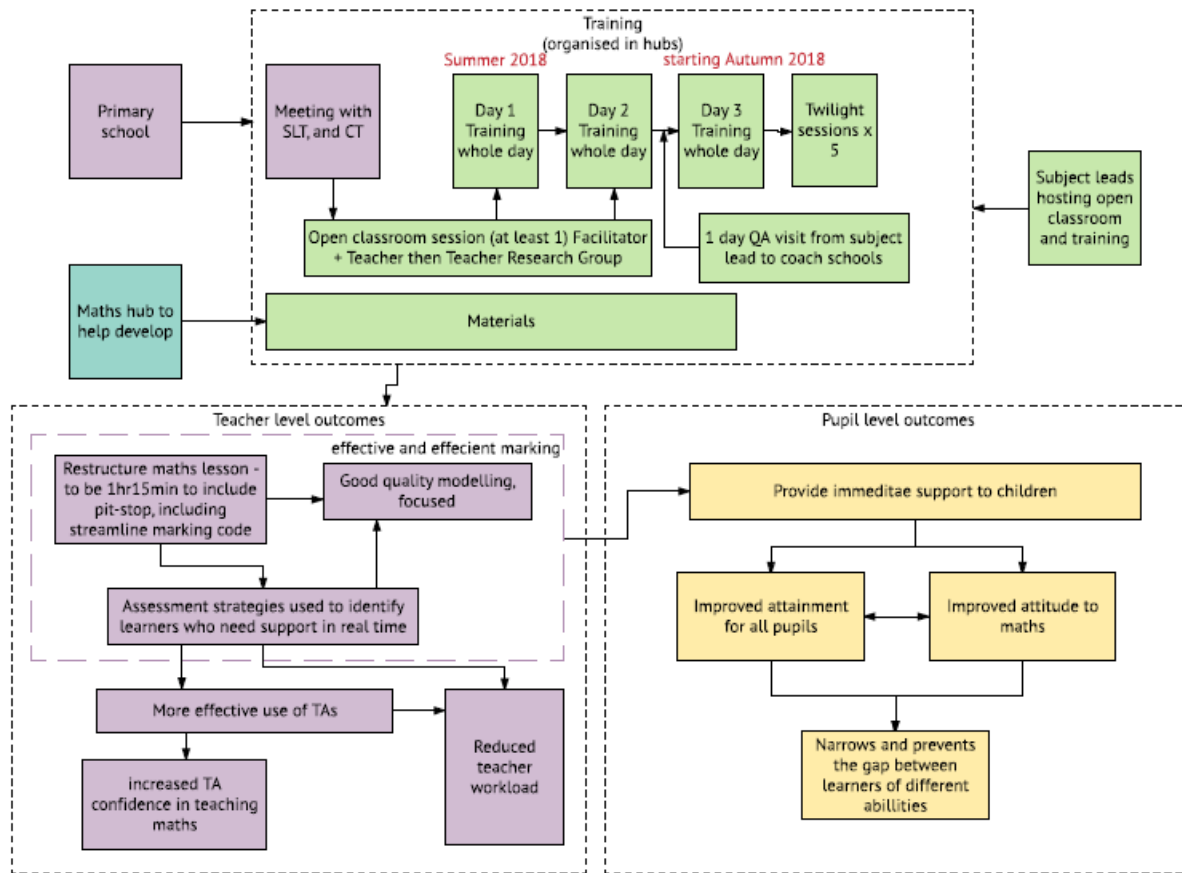
## Timeline

Dates	Activity	Staff responsible/ leading
January 2018 – May 2018	Schools recruitment	Yorkshire and the Humber Maths Hub
February - May 2018	Parental opportunity to withdraw period	NatCen
March - May 2018	Teacher pre-intervention survey and collection of pupil data	NatCen
June 2018	Randomisation completed and schools notified	NatCen
September 2018	Delivery of intervention begins	Yorkshire and the Humber Maths Hub
Feb-March 2019	NPD data request (baseline attainment, FSM status etc)	NatCen
March - April 2019	Qualitative – Case study visits	NatCen
March - April 2019	Telephone interviews with control schools	NatCen
May – June 2019	Teacher post intervention survey	NatCen
May - June 2019	Pupil assessment	NatCen
July 2019	Delivery of intervention ends	Yorkshire and the Humber Maths Hub
July - August 2019	Marking of tests	NatCen (GL to do marking)
September - Nov 2019	Draft of report	NatCen
Dec - Feb 2019	Peer review and finalisation of report	EEF and NatCen
October - December 2020	Optional follow-up: Obtain Key Stage 2 SATs from NPD. Draft addendum report.	NatCen
March-May 2021	Optional follow-up: Peer review and final addendum report.	EEF and NatCen



# Appendices

## Appendix 1: Theory of Change



**Trial Evaluation Protocol**  
**[Same Day Intervention]**  
 Evaluator (institution): NatCen  
 Principal investigator(s): Daniel Phillips



Template last updated: March 2018

**Appendix 2: Initial power calculations**

The table below provides the original power calculations for an efficacy trial of Same Day Intervention incorporating 120 schools.

		OVERALL	FSM
<b>MDES</b>		0.21	.23
<b>Pre-test/ post-test correlations</b>	level 1 (pupil)	0.5	0.5
	level 2 (class)	0.0	0.0
	level 3 (school)	0.1	0.1
<b>Intracluster correlations (ICCs)</b>	level 2 (class)	0.05	0.05
	level 3 (school)	0.14	0.14
<b>Alpha</b>		0.05	0.05
<b>Power</b>		0.8	0.8
<b>One-sided or two-sided?</b>		2	2
<b>Average cluster (school) size*</b>		54	8**
<b>Number of schools</b>	Intervention	60	60
	Control	60	60
	<b>Total</b>	120	120
<b>Number of pupils</b>	Intervention	3240	480**
	Control	3240	480**
	<b>Total</b>	6,480	960**

\*We assume two classes per school and 27 students per class. Figures based on data from Department for Education, Schools, Pupils and their Characteristics: January 2017 - National Tables

\*\*Proportion of FSM students anticipated to be national average for age-group of 14.4%, as in Department for Education, Schools, Pupils and their Characteristics: January 2018 - National Tables