***The ScratchMaths project is a randomised control trial that seeks to establish if the learning of computer programming in Scratch can improve not only computational thinking but also mathematics performance at Key Stage 2. It runs from late 2014 to the middle of 2017 and if successful, will subsequently be rolled out across the country.* *Please read through the following information and sign and return one copy of this document if you wish to join the project*.**

We hope that your school will take the opportunity to be one of 100 schools in England to participate in this innovative project based at the UCL Institute of Education and supported by the Education Endowment Foundation (EEF). Project partners include Sheffield Hallam University, London Connected Learning Centre (CLC) and The National Association for the Advancement of Computer Education (Naace).

This project will produce materials and offer professional development that is aligned with the Computing Curriculum (Y5) and the Mathematics Curriculum (Ys 5 and 6). It will aim to boost mathematics scores at KS2 by approaching some of the mathematics involved through creative programming in Scratch.

Participating schools will normally be two-form entry. Schools will also need to meet the technical requirements set out in the memorandum of understanding.

The project is a randomised control trial – similar to those used in medicine to test the effectiveness of a new treatment. The 100+ schools selected will be randomly split into 50 *treatment schools* and 50 *control schools* in March 2015.

Involvement in the CPD and delivery of the interventions will be staggered.

**Treatment schools will**

* receive two specially designed curriculum-aligned interventions for Ys 5 and 6 in *computational thinking* and *mathematical thinking*, which include free student materials and teacher guidance using MIT’s Scratch software (<http://scratch.mit.edu/>). In addition we will provide two days of CPD, separated by a couple of weeks, in each of the summer terms 2015 and 2016 after KS2 testing.
* receive free CPD for teachers who will be teaching the interventions (computational thinking in Y5 and ScratchMaths in Y6).
* be invited to participate in an online teacher community for mutual support and advice.

be require not to share Y5 project resources with other schools (in year one of the project) and Y6 project resources (in year two)

**Control schools** will receive free access to Y5 ScratchMaths materials and training in computational thinking in summer 2016. They will receive all of the materials for Y6, in 2017. They will be invited to participate in an online community in summer 2016.

All schools will receive feedback on the outcomes of the study to inform future practice.

Sheffield Hallam University will be conducting the analysis of the effects of the intervention. To take part, schools will need to provide Sheffield Hallam with data on teachers who will be taking part as well as the Unique Pupil Numbers (UPNs) for all Year 5 pupils in the school. Schools will also need to inform parents and give them the choice for their children to opt-out.

To see if the programme is effective, Sheffield Hallam University will retrieve KS1 scores for the Y5 pupils from the National Pupil Database. In Summer 2016, the Y5 pupils will take an on-line test of computational thinking arranged by Sheffield Hallam. Support will be given to schools to administer this. Test taking can be staggered and schools will be able to choose when the pupils will take the test, within a given time period. At the end of the trial, Sheffield Hallam will retrieve KS2 data from the National Pupil Database.

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|  | **Treatment schools** | **Control schools** |
| **Application to apply** | Complete MOU. Provide pupils UPN to SHU | Complete MOU. Provide pupils UPN to SHU |
| **Summer ‘15** | CPD computational thinking (Y5) | (ongoing school activities for Y5 computing ) |
| **Autumn ’15 /Spring ‘16** | Computational thinking intervention (Y5)online teacher survey | (ongoing school activities for Y5 computing)online teacher survey |
| **Summer ‘16** | CPD ScratchMathsComputational thinking test (Y5)online teacher survey | CPD computational thinkingComputational thinking test Y5 online teacher survey |
| **Autumn ’16 /Spring ‘17** | CPD ScratchMaths intervention (Y6)online teacher survey | Computational thinking intervention (Y5)online teacher survey Computational thinking test (Y5)  |
| **Summer ‘17** | Key Stage 2 Mathematics test as normal | Key Stage 2 Mathematics test as normal |

100 schools will be selected for the trials and randomly split into 50 treatment schools and 50 control schools. Prior to the trial starting ALL schools will…

***Technical requirements***

* ensure adequate Internet connectivity is available for Y5 and Y6 pupils at the time of the interventions.
* ensure enough machines are available (one between two at least) for the Y5 and Y6 pupils at the time of the interventions.
* to run Scratch 2.0 online with the whole group/class of pupils in parallel, you will need a relatively recent web browser (Safari, Chrome 7 or later, Firefox 4 or later, or Internet Explorer 8 or later) with Adobe Flash Player version 10.2 or later installed. Scratch 2 is designed to support screen sizes 1024 x 768 or larger.
* Scratch 2.0 does not work on iPads and similar devices, so we advise testing Scratch on the computers to be used before agreeing to take part in the project.

NOTE: The project team has received written consent from MIT's Scratch team that each school will be allowed to set up individual Scratch accounts for each of their participating pupils.

***Data***

* provide information on request about the school and two teachers who will be involved in the project. This includes teachers’ attendance at CPD, current activities related to programming and the National Curriculum for Computing; information on any other use of Scratch programming in the school; information on any testing procedures for computing. A link to a short online form will be sent to each school for completion.
* issue information about the project and opt - out consent forms to parents and provide details of any parents opting out.
* Provide Unique Pupil Numbers (UPNs) for the pupils who are involved in the trial and agree that the research team can access the National Pupil Database to retrieve KS1 and KS2 data as well as demographic data such as free school meals status, gender and so on.

 **(no individual school or pupil will be named in any report or publication arising from the research.)**

**Surveys/testing**

* agree for participating teachers to take part in online surveys during 2015/17.
* allow pupils to take part in the Y5 computational thinking test in Summer 2016, administered by SHU (30 minutes maximum length), and for members of the Sheffield Hallam team to visit if needed to review how the tests are conducted.

agree to recording any issues that might affect the fidelity of the implementation of the intervention e.g. any changes in the teachers who deliver the interventions.

**Schools selected as TREATMENT SCHOOLS will…**

***Teaching***

* allow for up to 20 hours of teaching time per school year for engagement with the specially designed curriculum units (computational thinking, Y5, 2015-16 leading to ScratchMaths, Y6, 2016-2017).

***CPD***

* allow two teachers to attend CPD sessions (after KS tests), two days summer 2015 and two days summer 2016. The teachers trained will be those who are teaching the targeted group the following September, (that is Y5 for September 2015/16 and Y6 for 2016/17).

***The research***

* allow members of the ScratchMaths project team to visit and observe lessons at pre-arranged convenient times.
* allow participating staff to take part in, for example, research interviews, surveys and events as required by the project within reasonable scope of their time and availability.

**Materials**

* be required not to share Y5 project resources with other schools (in year one of the project) and Y6 project resources (in year two)

**Schools selected as CONTROL SCHOOLS will…**

***Teaching***

* continue your normal teaching programme of computing and mathematics 2015/16
* choose to use intervention computational thinking materials in 2016/17

***CPD***

* allow two teachers to attend CPD sessions, two days in summer 2016.

***The research***

* allow members of the ScratchMaths project team to visit and observe lessons at pre-arranged convenient times.
* allow participating staff to take part in research interviews, surveys and events as required by the project within reasonable scope of their time and availability.

**The PROJECT will make the following commitments:**

***Feedback***

* provide feedback on how the school could develop its approach to pupils' development of computational thinking by providing responses to computational thinking tests.

***CPD and student/teacher materials***

* provide professional development and all the materials for Y5 and Y6 as set out above by the end of the project.

***Ethics/ Data protection***

* perform all necessary ethical checks to make sure school staff and pupils and project researchers are acting in accordance with ethical procedure. All researchers entering school premises will hold a current DBS (formerly CRB) check.
* Test results and pupil data will be treated with the strictest confidence. The tests results will be matched with data from the National Pupil Database (including if available item-by-item scores)and potentially other government data sets, and shared with researchers at Sheffield Hallam University, The University of London, the Education Endowment Foundation's data archive and the UK data archive for research purposes We will not use pupil name or the name of the school in any report arising from the research.
* We will provide outcomes of the tests to your child's school so that the teachers can use the results to decide how they can help children to learn more

***Support for computational thinking test***

* Sheffield Hallam University will provide written, email and telephone support for testing

If the above terms are acceptable, please sign and date both copies, keep one for your records and return one to J. O’Toole, ScratchMaths, LKL, 23 Emerald St, London, WC1N 3QS or by email to j.otoole@ioe.ac.uk

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| **Signed** | Macintosh HD:Users:oojcdadt:Desktop:current:Celia signature.png | **Signed** | Description: Macintosh HD:Users:oojcdadt:Desktop:Screen Shot 2014-09-15 at 15.44.27.png |
| **Name** | Prof. Dame Celia Hoyles, ScratchMaths project | **Name** | Professor Richard Noss, ScratchMaths project |
| **Signed** |  |  |  |
| **Name** | Dr Mark Boylan, Evluator, Sheffield Hallam University |  |  |
| **Name** |  | **School** |  |
| **Role** | **Headteacher** | **Date** |  |
| **Maths Co-ordinator name** |  | **Maths Co-ordinator email** |  |
| **Computing/ICT Co-ordinator name** |  | **Computing/ICT Co-ordinator email** |  |
| **My school is \_\_\_ form-entry (current Year 4)** |