Digital
Schoolhouse

ukie
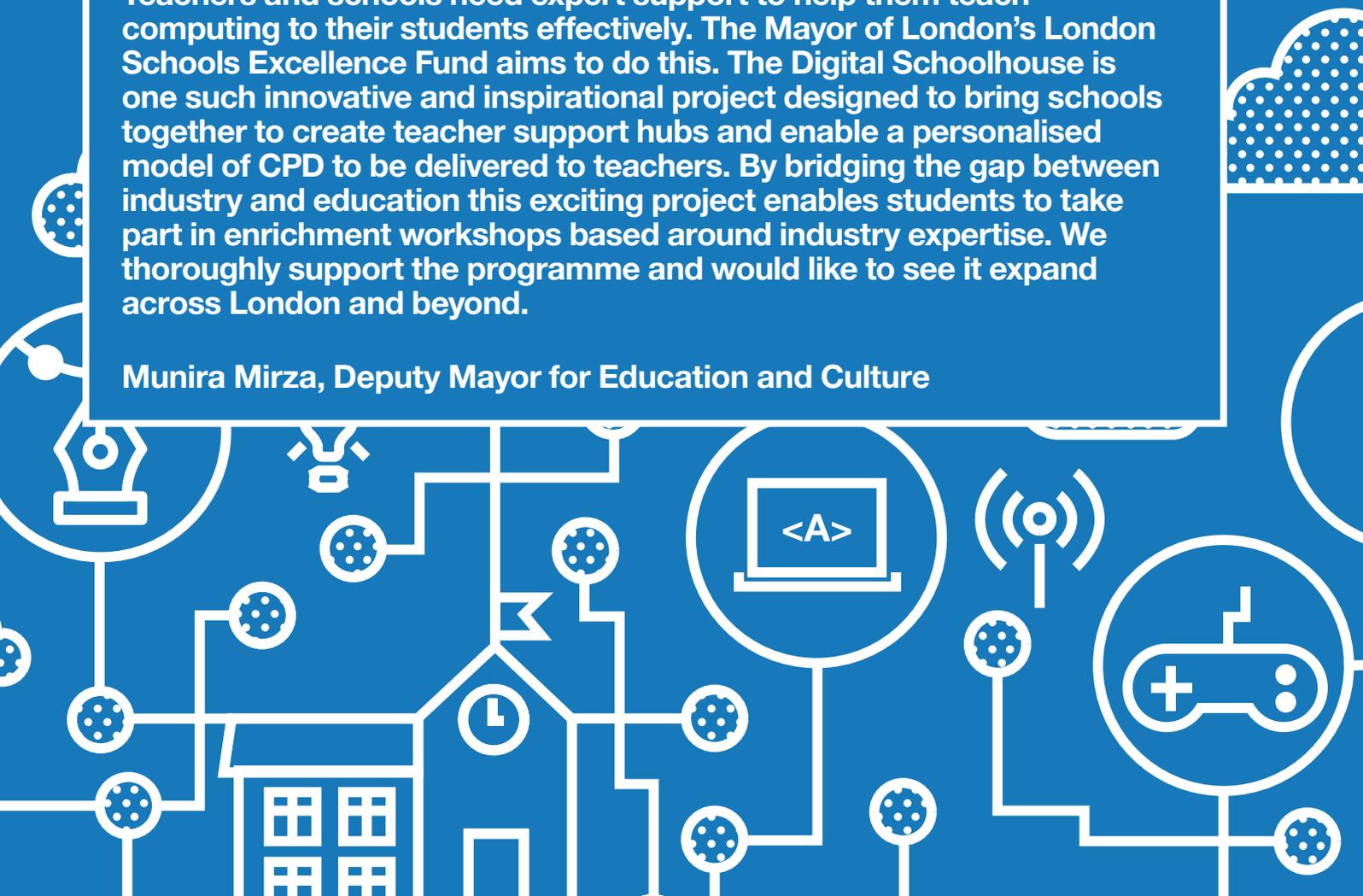
digital
schoolhouse
Inspirational Computing for Kids

SUPPORTED BY

MAYOR OF LONDON

Foreword

The new computing curriculum was introduced in September 2014 and brought in a new phase to computing education. While the new curriculum is just what we need to ensure our students are prepared for their Digital future, the journey doesn't end here.

Teachers and schools need expert support to help them teach computing to their students effectively. The Mayor of London's London Schools Excellence Fund aims to do this. The Digital Schoolhouse is one such innovative and inspirational project designed to bring schools together to create teacher support hubs and enable a personalised model of CPD to be delivered to teachers. By bridging the gap between industry and education this exciting project enables students to take part in enrichment workshops based around industry expertise. We thoroughly support the programme and would like to see it expand across London and beyond.

Munira Mirza, Deputy Mayor for Education and Culture

Welcome

With the advent of the new Computing curriculum we have a wonderful opportunity to do something completely different for the first time.

The Digital Schoolhouse programme aims to combine fun, creativity, innovation and play-based learning to bring a truly unique learning experience to classrooms. Externally verified results clearly show that our approach works. Through participation in the programme we have seen a significant impact on learner's progression and engagement with computing. Teachers too have reported improved motivation, confidence and understanding. Our collaborations with industry have enabled us to bring the latest innovation and expertise directly into the classroom. Everyone benefits, it's a win win situation. But it doesn't end here. We are aiming to get bigger and better than ever before and we need your help to do that.

If you have a great idea that you would like to see bought into the classroom, would like to become a Digital Schoolhouse or attend one; or if you would like to support us by funding the continuation of the programme then please get in touch. I look forward to working with you.

Shahneila Saeed
Head of Education at Ukie

What is the Digital Schoolhouse?

Delivered by the video games trade body UK Interactive Entertainment Association (Ukie) and supported by the Mayor of London's London Schools Excellence Fund, the Digital Schoolhouse model is a transition programme running out of primary and secondary schools.

Secondary schools become Digital Schoolhouses, and offer free weekly workshops to visiting primary school pupils and teachers. Each Digital Schoolhouse secondary school teacher is given bespoke training by universities and industry professionals to improve their subject knowledge and teaching pedagogy, as well as training on delivering highly effective CPD.

The local primary schools benefit from the expertise of the secondary teacher by booking for their pupils to visit their local Digital Schoolhouse and participate in an enrichment day. The aim of the day is to teach pupils computing in a way that is creative, innovative, inspirational, engaging and fun. Computer Science concepts are taught wherever possible without the use of computers and related to pupils existing 'real world' understanding and the fusion of art and science ('STEAM') e.g. through dance, art, mathematics, literacy and magic.

To develop primary school teachers' confidence in delivering the computing curriculum, each visiting primary school teacher is invited to jointly plan and prepare the enrichment day, with the Digital Schoolhouse teachers using the opportunity to learn from their primary colleagues to make it a much more collaborative approach to professional development.

During the workshop outstanding teaching is modelled, and the primary teachers are encouraged to participate in its delivery. All the teaching resources and activities are freely provided to the teacher at the end of the day, along with suggestions of extended activities that they can continue with at school.

Results show that primary schools will visit year on year taking the opportunity for sustained CPD across the full breadth and depth of the curriculum.

"Cool! Learning what an algorithm is and how we use it in our daily life. It was super interesting. I loved the robot dance. Great workshop."
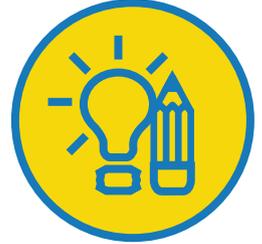
Leah

"*Participating in the Digital Schoolhouse programme improves teacher pedagogy.*"

Primary School Teacher

"*Many workshops written in collaboration with the creative industry.*"
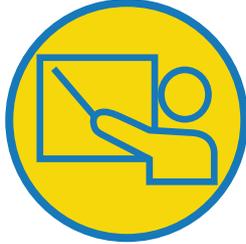
Creative Industries

Creative, innovative, inspirational, engaging and fun computing!
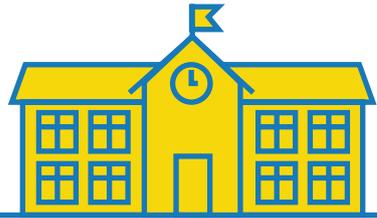
Support & training

Support

Digital Schoolhouse Secondary School

Training

"*Using latest educational and pedagogical research.*"

Primary School Pupils

Inspirational Computing & Enrichment Day

Universities

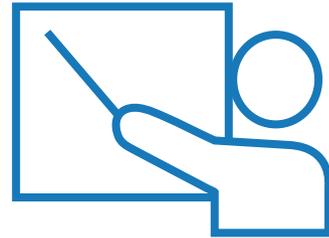"*Pupil feedback describes Digital Schoolhouse workshops using terms such as 'amazing' and 'I love it'.*"

Stats

In Year 1:

5500 pupils

600 teachers

192 workshops

80 schools

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Benefits

Through the research conducted it is evident that the programme has a number of proven benefits for teachers of both primary and secondary schools as well as the learners involved.

Primary schools

- Improved Key Stage 2 to 3 transition with local secondary school
- Significantly improved teacher confidence in delivery of the new curriculum
- Building teacher subject knowledge of concepts covered within the new curriculum
- Pupils find the workshops fun, engaging and inspirational, often continuing with the work in their own free time.
- Teachers welcome the receipt of personalised and sustained ongoing support from local secondary expert to aid delivery of the new curriculum.
- Participation in the workshops significantly improves pupil's confidence and understanding of computer science concepts, with clear signs of improved educational attainment

Secondary Schools

- Improving the transition experience from Key Stage 2 to Key Stage 3, enabling secondary school teachers to have a better understanding of the new intake.
- Improved links with feeder primary schools (and beyond)
- Improved understanding and development of pedagogical skills to enhance the delivery of the new curriculum. This results in better quality computing lessons for the visiting primary pupils and the Digital Schoolhouse teacher's own Key Stage 3 to Key Stage 5 students.
- Improved teacher confidence
- Raised profile of computing within the school and the local community
- Raised profile of the school within the local community

Additional benefits for participating within the programme are:

- Free training provided by Digital Schoolhouse leaders, university academics and professionals from the creative and ed-tech industries
- Free adaptable resources for Digital Schoolhouses and secondary classroom use (digitalschoolhouse. org.uk/workshops)
- Training local teachers through innovative CPD methods and meeting outreach needs
- Sustainability options for the Digital Schoolhouse through delivery of not for profit CPD and expert support
- Free adaptable resources, written in a cross–curricular, creative approach for primary schools to use (digitalschoolhouse.org.uk/workshops)

Playful Computing: getting creative!

Bridging the Gap between industry and the classroom

Many of the workshops in the Digital Schoolhouse London Programme are developed in collaboration with the creative industries to bring cutting edge resources and key principles into the classroom. Some collaborations include:

- **Disney:** collaborated on the development of two workshops. "Oddventurous Gaming" brings the industry's game design principles into the classroom; "DigiSafe: Be Smart…Be Cyber Smart!" was developed with the Disney Club Penguin team to teach digital literacy and e-safety.
- **Tech Will Save Us:** Using the DIY Gamer Kit to allow pupils to create their own handheld programmable games consoles, powered by Arduinos.
- **Apps for Good:** have contributed their expertise to developing the new workshop entitled "App in a Day" which provides primary level pupils with a taster day of their full 32-week programme.
- **Kuato Studios and the Video Games Ambassadors (STEMNET):** collaborated in the development of the "Loopy Games" workshop to teach games design principles
- **3Doodler:** Digital Schoolhouses are the first schools in the country to use this 3D printing pen to teach computational thinking.

- **Code Kingdoms:** Multiple resources developed including a popular board game which teaches pupils programming concepts using a game that teachers can literally print and play.

Do you have an idea that you'd like to see developed? Then let us know. We are actively seeking new partners to collaborate with on an interesting range of creative classroom ideas.

"Digital Schoolhouse operates in a fantastic sweet spot to connect schools with industry and professional development so that teachers are up-skilled and our students inspired by computing."

**Daniel O'Sullivan
COO of Code Kingdoms**

Play-based learning

The new Computing Curriculum places computational thinking and creativity at its heart. These concepts and ideas underpin the entire subject. But it's easier said than done! For starters, what is computational thinking and how do you teach creativity? Creativity needs the right conditions, including a playful state of mind; time and space to think; and the opportunity to bounce ideas off each other. The Digital Schoolhouse programme aims to foster creativity in the classroom by using a range of 'unplugged' and play-based learning techniques to teach computing and computational thinking.

Play-based learning provides a fun and innovative way to help learners understand and visualise otherwise potentially abstract (and complex) concepts. When compared to traditional teaching methods, play-based learning employs a looser, more creative lesson format and gives pupils greater scope to solve problems and discover solutions rather than working towards one prescribed 'correct' result.

Our free resources embed computational thinking and creativity into full lesson schemes and plans which are mapped onto the computing curriculum. Some of our unique range of activities include:

- Programming through dance
  ◊ through magic (a CS4FN collaboration)
  ◊ through playdough
  ◊ through board games
- Developing jigsaw puzzles to teach computational thinking
- Playing word games to asses understanding

We are always looking to develop more – so get involved if you have a unique idea

Curriculum & Assessment

Recent changes to education have left schools to develop their own strategy to deal with life after levels. How do we asses our learners effectively? While the Digital Schoolhouse doesn't propose a singular assessment model for schools to adopt, we do ensure all our materials are mapped to the widely recognised CAS Progression Pathways and the CAS Computational Thinking Framework. The Digital Schoolhouse programme developed a unique referencing system for each strand of the CAS Progression Pathways and Computational Thinking Framework (digitalschoolhouse.org.uk/content/curriculum-assessment). Each activity within every curriculum resource has been carefully mapped onto the different strands. Thereby signposting potential progression criteria for schools to use within their own assessment models.

"A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world."
Computing National Curriculum, September 2013

Highgate Wood School Digital Schoolhouse

At Highgate Wood school we run the Digital Schoolhouse programme by visiting our local feeder primary school. This gives our primary schools the ability to utilise their facilities and learning environment. We conduct initial visits to the local primary schools to see what they would like from the programme and to see how we as a school can help the teachers to be able to teach their students computer science.

With the changes in the national curriculum, we found that our local primary school found the new computer science curriculum as a steep learning curve. After discovering the Digital Schoolhouse programme we found this as a perfect opportunity for us as a school to help develop the primary school students and their teachers and prepare them for secondary school. Our expectations of the programme were to prepare primary school students for secondary school and for us as a school to build our relationship with the primary schools.
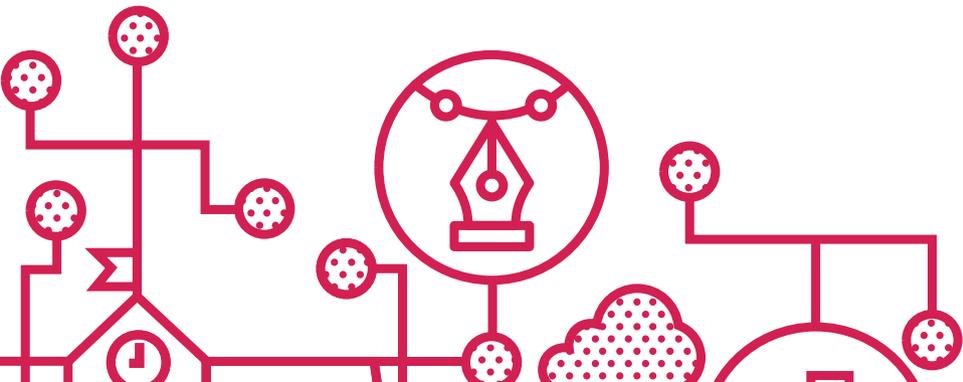
The programme has been successful we found that those students who undertook the programme and ended up attending the school as Year 7 students found the transition from primary to secondary an easy one. This met our expectations as their knowledge, understanding and skills have been enhanced due to the programme.

The teaching and learning of the department as a whole has also changed as we gained a greater understanding of primary school teaching. This resulted in a change in the way we teach our year 7 students and making transition between key stage 2 and 3 easier for the students. The content of our curriculum has also been developed to take into account previous knowledge due to their participation in the programme.

> *"This was the funniest activity. Nothing I've ever seen before. I thought the Arduino were so cool, I wish I had one of my own to play with at home."*
>
> **Rachel Shure**

Case study

Woodford County High School, Digital Schoolhouse

This case study is based on Ilford Jewish Primary School that attended the DSH on Thursday 26th February 2015. There were a total of 23 students accompanied by two staff.

The day was packed out with workshops that all students fully enjoyed and exceeded the expectations of the teachers who attending the day. The teachers greatly appreciated how the DSH facilities and refreshments met their expectation. Students were well mannered and were fully engaged. It was interesting to see how quickly the students picked up the skills taught and how they were able to apply their knowledge to develop their understanding. The unplugged workshop has allowed students to develop computational thinking through the interactive activities (sorting algorithm cards, role play, algorithm dance, identifying steps in a flow chart). This is an important workshop that many of the primary schools choose to participate in as the schools find that the theory aspect is difficult to teach and then apply.

Students particularly enjoyed workshop 2 – using the Arduino Gamer. This workshop focussed on student interaction with software, creating their image/animation and processing the output which was displayed on the hardware. They quickly picked up the skills of creating some basic to complex animations. This gave them an opportunity to realise the importance of planning and engaging in the thought process which allowed them to produce the output on the Gamer. They really found this fascinating and were interested in buying it as their next birthday present! Students were also fully engaged and excited by the thought of creating their own first web page using HTML coding. Students were introduced to HTML with "Hello World" and were amazed to see the text in web browser. This developed their interest to focus on coding further. They learned the HTML tags, opening and closing, using heading and changing background colour. This final workshop used HTML to teach the concept if correct use of HCI.

Woodford County has run many DSH days and all have been very successful. We aim to deliver quality, interactive and fun workshops based on the KS2 curriculum in our fully packed one day of computing of the chosen topics. It has met the expectations of the schools visited here at Woodford County as well as our expectation. The Digital Schoolhouse programme has allowed creativity and attention to detail in teaching and learning within our own school and through the workshops. The creative hardware provided has allowed us to be innovative with our workshops and engaging for the primary students.

So, how can we get involved?

Schools, fancy becoming a Digital Schoolhouse?

Signing up to become a Digital Schoolhouse is simple. Simply take two minutes to register your details at digitalschoolhouse.org.uk/signup or email Shahneila@ukie.org.uk. Once you've told us you are interested, we'll get in touch to arrange a visit to your school to help you set up.

Everybody else…

Do you have an innovative resource that we can use to teach computing at the Digital Schoolhouse? Or do you have some expertise that you'd like to share with us and/or our pupils? Then tell us how you'd like to get involved by taking two minutes to sign up here: bit.ly/DSHRegisterInterest or send an email to Shahneila@ukie.org.uk

Funding

The Digital Schoolhouses provide a free service to all primary schools. This means that they do not charge for the workshops or much of the CPD that they deliver. All the Digital Schoolhouse resources available via our website are also currently freely available. In order for this to continue, funding is vital to our cause. There are two suggested models of funding.

Sponsor a School
Would you like to help set up or help support a Digital Schoolhouse in your area? A recommended sum of approximately £10-15k can help run a Digital Schoolhouse for an entire academic year. This could mean making a difference with hundreds of children within your local area. If you are interested and would like to discuss this option further, then please email Shahneila@ukie.org.uk or register your interest at bit.ly/DSHRegisterInterest

Fund the project's 3-year expansion plan
Funding of £1.2m over 3 years is sought to establish at least one Digital Schoolhouse hub in each of the 15 video games clusters in England identified by NESTA (London, Brighton, Guildford-Aldershot, Manchester, Liverpool, Sheffield-Rotherham, Oxford, Warwick-Stratford-upon-Avon, Cambridge, Wycombe-Slough, Birmingham, Nottingham, Newcastle-Durham, Bristol, Luton-Watford).

Please email the Programme Director at Shahneila@ukie.org.uk if you would discuss this further.
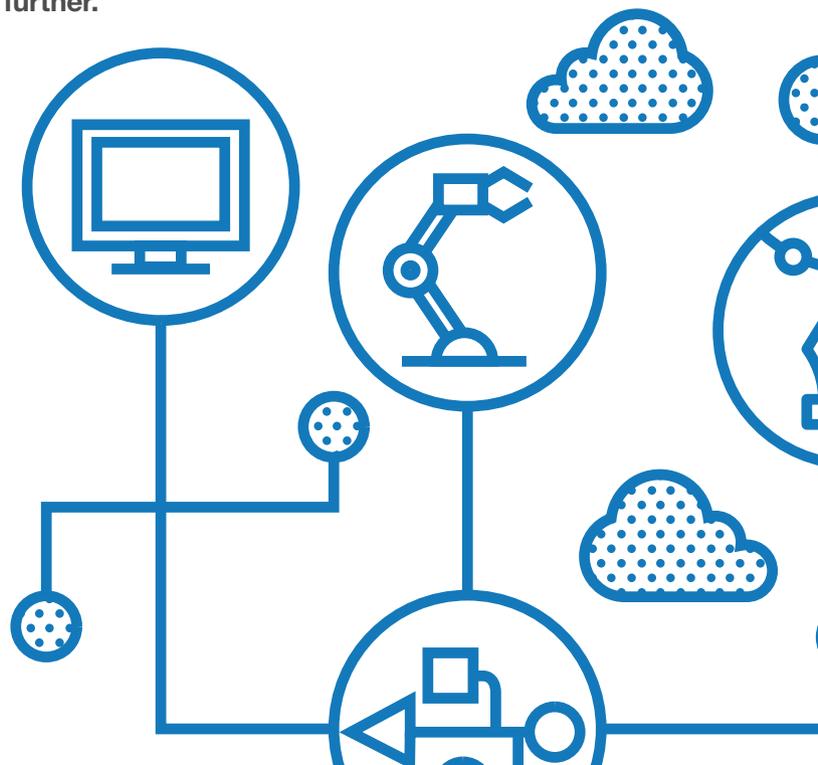
"My experience of Woodford County High school was amazing because I learned so many things!"

Mahnoor Imtiaz

DigitalSchoolhouse
digitalschoolhouse.org.uk

DigitalSchoolhouse on Youtube
bit.ly/DSHYouTube

Playful Computing
digitalschoolhouse.org.uk/content/
playful-computing

Sign up
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bit.ly/DSHRegisterInterest

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