MAYOR OF LONDON

Teach Computing

National Centre for Computing Education

Funded by Department for Education

Introduction to Primary Computing

Welcome to the session, we will be starting at **4pm.**

- Please use the text chat to communicate in this session. If you cannot hear the facilitator, please let us know in the text chat.
- Please keep your microphone muted at all times.
- Please do not share any personal data or confidential information in this session.

Course Materials

Please access the session materials & activities from the chat window, a link has been posted

or

use QR reader

SCAN ME

Music: https://www.bensound.com

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Introduction to Primary Computing

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Subject Matter Expert
NCCE & Stem Learning UK
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Session Aims

- Explore the three strands of the curriculum, considering what kinds of activities fit into each
- How to best support pupils to develop computational thinking skills
- Teaching the ‘Big 3’ programming concepts of sequence, repetition, and selection.
- Explore the wealth of resources, support and fully funded CPD available from the National Centre for Computing Education (NCCE).

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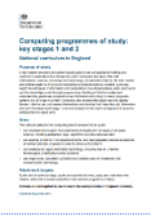
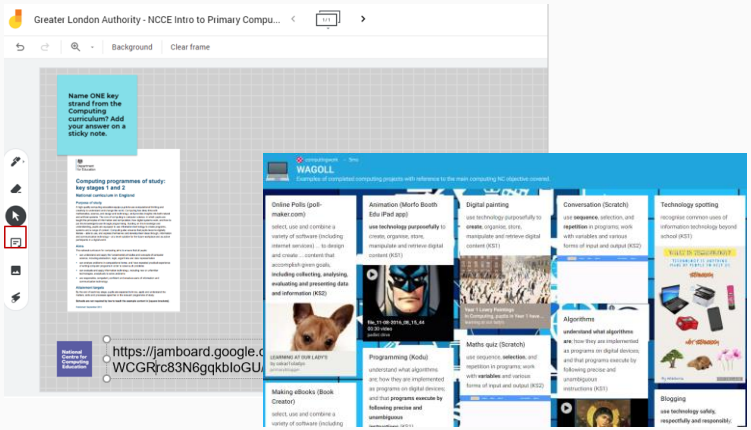
Session Material/Activities

NCCE - Session Materials: Introduction to Primary Computing
https://docs.google.com/document/d/1BRVPPMEEAd71GwDENCcwnMBxDoFfkJ7Znh-rbm2sK3I/edit?usp=sharing

Presentation Slide		Links
	Computing POS	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239033/PRIMARY_national_curriculum_-_Computing.pdf
	Participant activity - Name one key strand from the Computing curriculum.	https://jamboard.google.com/d/1ntyBtTJ_qgNdn0fGk7B1VLkwDWCGRrc83N6gqkbIoGU/viewer
	KS1 Computing POS	https://forms.gle/jDACjV2WEAmAqhkJ9
	KS2 Computing POS	https://forms.gle/5xux535gzbYMeNsL8
		https://padlet.com/computingwork/WAGOLL/wish/416923723
	Scratch 3- Interface	https://drive.google.com/file/d/1GZAq9v68gnNQGOlj15rLT

https://docs.google.com/document/d/1BRVPPMEEAd71GwDENCcwnMBxDoFfkJ7Znh-rbm2sK3I/edit?usp=sharing



Please access the session materials & activities from the chat window, a link has been posted

or

use QR reader

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Why computing?

Why it is important that we give our pupils a good standard of Computing education.

Why teach computing?

- 12m people don't have the skills to thrive in the digital era. (BT)
- the UK needs an estimated 1.2 million new digitally skilled people by 2022 to satisfy future skills needs (UK Digital Strategy).
- £63 billion of GDP pa is lost to the UK economy due to digital skills shortages which inhibits growth and opportunities for employment (UK Digital Strategy).
- we want to encourage young people to be positive, digital citizens.
- additionally, ‘there is a national shortage in computer science teachers that justifies schools recruiting from abroad’ (Home Office Migration Advisory's Committee [MAC]).

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The transition from ICT to Computing

What happened to ICT and how does this translate to our teaching of this ‘new’ subject Computing?

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Why the change from ICT to Computing?

"The current delivery of Computing education in many UK schools is highly unsatisfactory. Although existing curricula for Information and Communication Technology (ICT) are broad and allow scope for teachers to inspire pupils and help them develop interests in Computing, many pupils are not inspired by what they are taught and gain nothing beyond basic digital literacy skills such as how to use a word-processor or a database."

Shut down or restart? - Royal Society

A report into the standard of ICT teaching in schools, published January 2012.

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Main changes

- September 2014 name change to ‘Computing’
- greater emphasis on **computer science**
- higher expectations – children expected not just to ‘do’ but ‘understand’
- significantly more and harder CS objectives
- new vocabulary: **algorithms, debugging & variables**

***unplugged activities**

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The 3 strands of Computing

The 3 key components of the Computing curriculum.

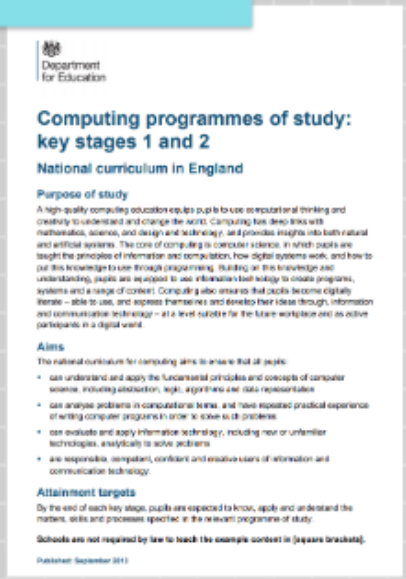
What should I be teaching?

Greater London Authority - NCCE Intro to Primary Compu...

1 / 1

Background | Clear frame

Name ONE key strand from the Computing curriculum? Add your answer on a sticky note.



Department for Education

Computing programmes of study: key stages 1 and 2

National curriculum in England

Purpose of study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Schools are not required by law to teach the example content in [square brackets].

Published: September 2013

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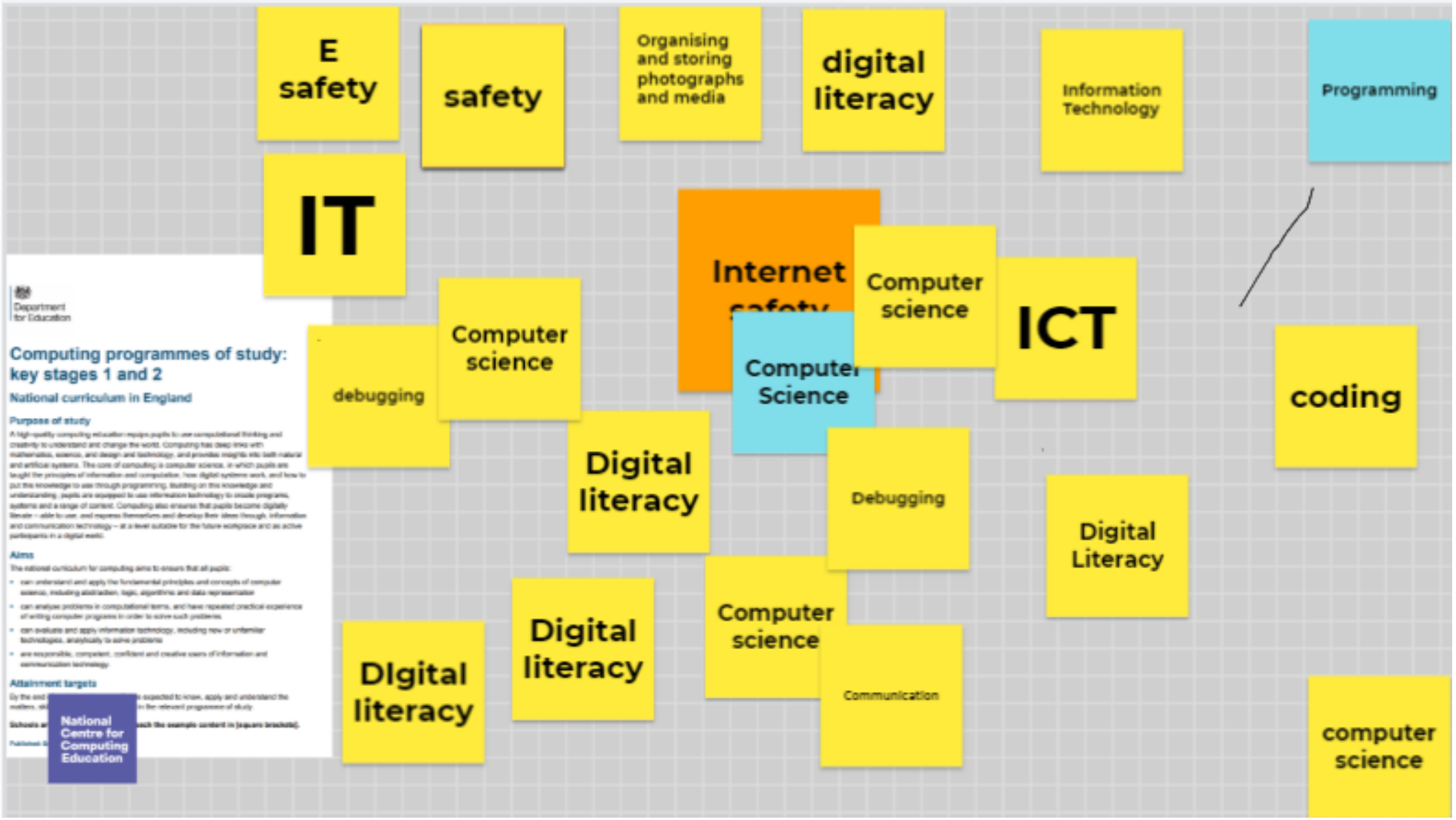
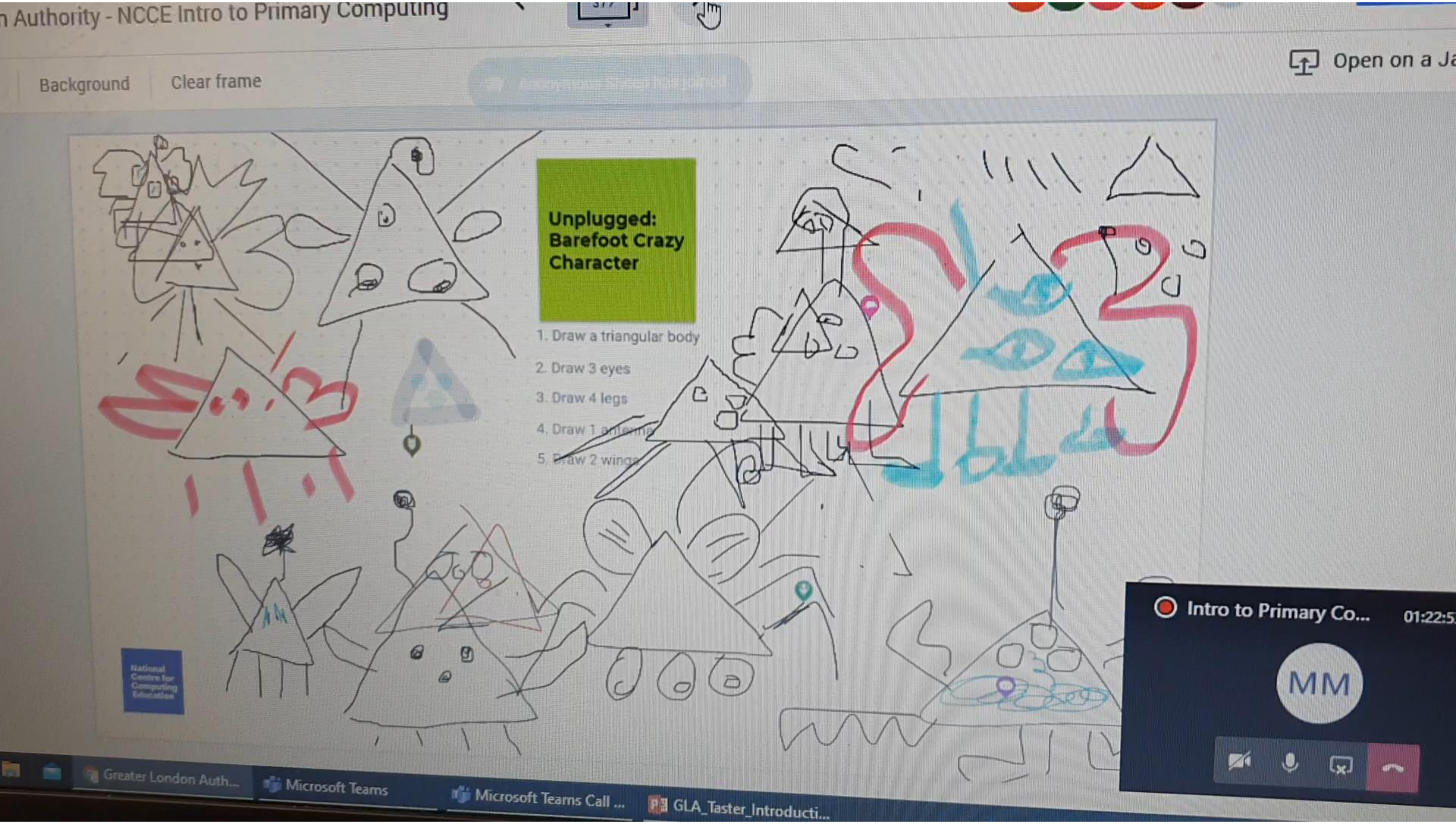
https://jamboard.google.com/d/1ntyBtTJ_qgNdn0fGk7B1VLkwDWCGRrc83N6gqkbIoGU/viewer


E safety
safety
Organising and storing photographs and media
digital literacy
Information Technology
Programming
IT
Department for Education
Computing programmes of study: key stages 1 and 2
National curriculum in England
Purpose of study
Aims
Attainment targets
National Centre for Computing Education
Internet safety
Computer science
ICT
debugging
Computer science
Computer Science
coding
Digital literacy
Debugging
Digital Literacy
Computer science
Digital literacy
DIgital literacy
Communication
computer science



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Computer Science	Information Technology	Digital Literacy
How computers and computer systems work & how they are designed and programmed	The purposeful use of existing programs to develop products and solutions	The skills, knowledge and understanding needed in order to participate fully and safely in an increasingly digital world.
Foundations	**Applications**	**Implications**

KS1 – Computer Science, Information Technology, Digital Literacy

Pupils should be taught to:

1. understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
2. create and debug simple programs
3. use logical reasoning to predict the behaviour of simple programs
4. use technology purposefully to create, organise, store, manipulate and retrieve digital content
5. recognise common uses of information technology beyond school
6. use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

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KS2 - CS, IT, DL

1. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
2. use sequence, selection, and repetition in programs; work with variables and various forms of input and output
3. use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
4. understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
5. use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
6. select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
7. use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

KS2 - **CS**, IT, DL

1. design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
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7. use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern**s about content and contact.**

Other considerations

What else is important in my teaching of Computing?

Ofsted

The inspection framework focuses very much on coverage across school on all curriculum areas (not just maths and English)!

Inspectors are looking to see if there is clear progression of learning across all year groups within the subject.

- does your teaching ensure that there is progression of knowledge and skills across the computing curriculum?
- how does this build on and fit in with what they learn in previous and subsequent year groups?

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The breadth of the curriculum

What kinds of things should I be teaching in order to cover the curriculum requirements?

5		Breadth and range of activities (Padlet)	https://padlet.com/computingwork/WAGOLL/wish/416923723

computingwork · 5mo

WAGOLL

Examples of completed computing projects with reference to the main computing NC objective covered.

Online Polls (poll-maker.com)

select, use and combine a variety of software (including internet services) ... to design and create ... content that accomplish given goals, **including collecting, analysing, evaluating and presenting data and information (KS2)**

LEARNING AT OUR LADY'S
by oskar1oladys
primaryblogger

Making eBooks (Book Creator)

select, use and combine a variety of software (including

Animation (Morfo Booth Edu iPad app)

use technology purposefully to create, organise, store, manipulate and retrieve digital content (KS1)

file_11-08-2016_08_15_44
00:30 video
padlet drive

Programming (Kodu)

understand what algorithms are; how they are implemented as programs on digital devices; and that **programs execute by following precise and unambiguous instructions** (KS1)

Digital painting

use technology purposefully to **create**, organise, store, manipulate and retrieve digital content (KS1)

Year 1 Lowry Paintings
In Computing, pupils in Year 1 have ...
learning at our lady's

Maths quiz (Scratch)

use sequence, **selection**, and repetition in programs; work with **variables** and various forms of input and output (KS2)

Conversation (Scratch)

use **sequence**, selection, and **repetition** in programs; work with variables and various forms of input and output (KS2)

Algorithms

understand what algorith
are; how they are implem
as programs on digital de
and that programs execu
following precise and unambiguous instructions (KS1)

Technology spotting

recognise common uses of information technology beyond school (KS1)

Blogging

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Sequence of learning

What do we hope our pupils will remember for future teachers?

https://pxhere.com/en/photo/1585491

Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs

Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration

What do we actually mean by programming?

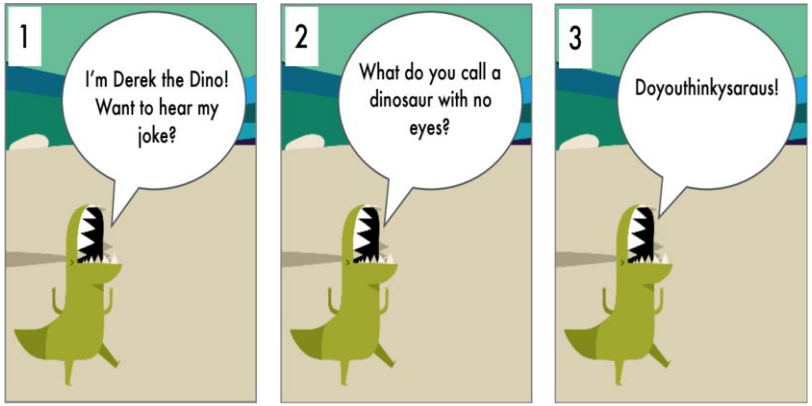
Both the Key Stage 1 and Key Stage 2 computing PoS references the word ‘programs’ or ‘programming’ frequently but what do we actually mean by this?

What is programming?

Adapted from : barefootcomputing.org

Design including an algorithm

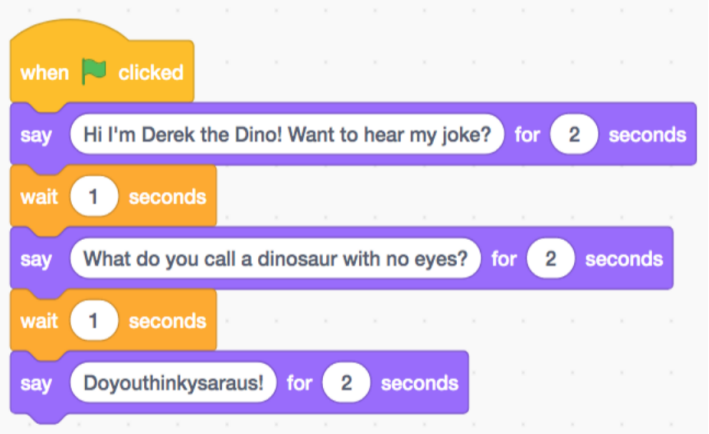
=



Deciding on the sequence of steps or rules needed to complete the task.

+

coding



Implementing the design and algorithm in a language the computer understands (e.g. Scratch)

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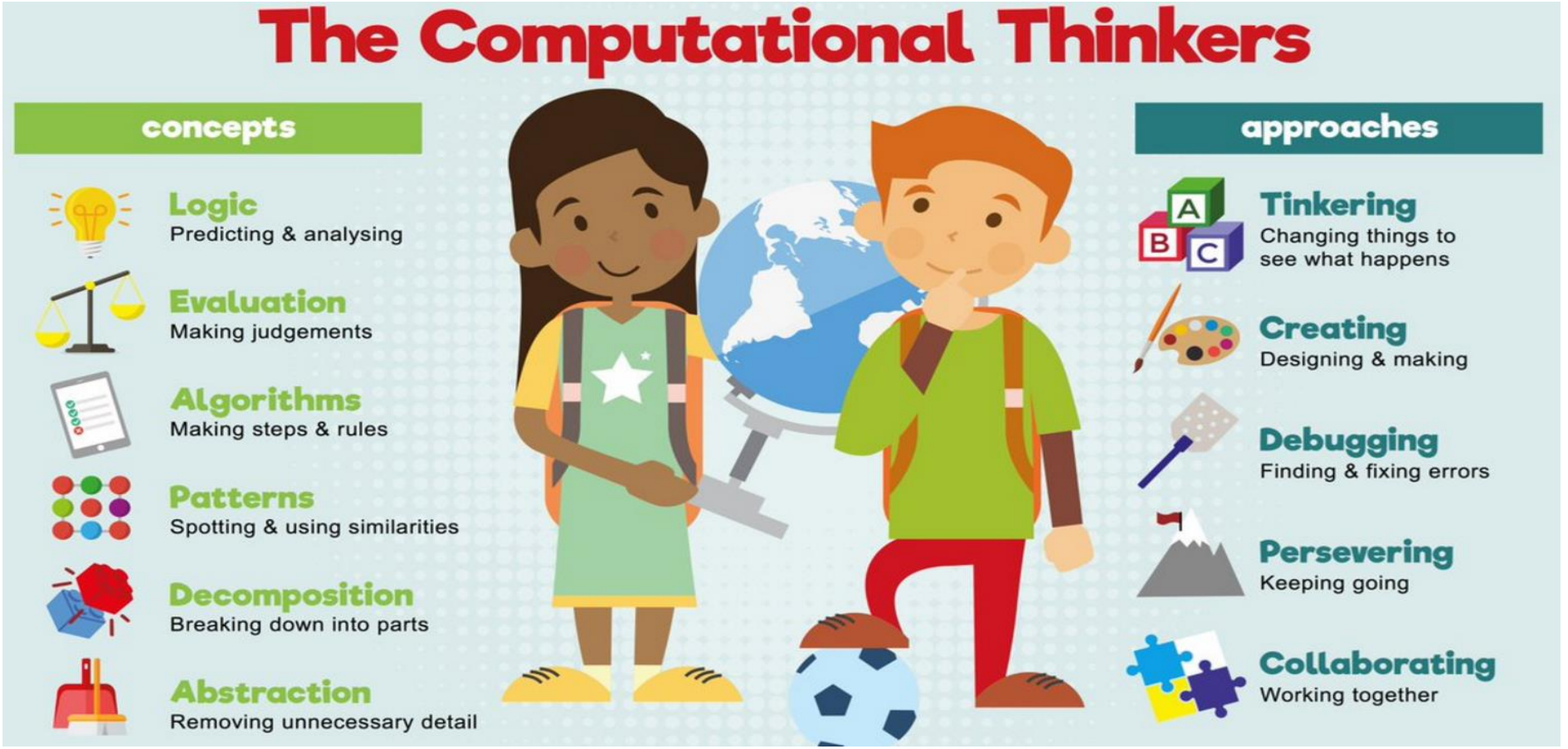
What is Computational Thinking?

source : barefootcomputing.org



A precise step by step guide to achieving a specific outcome

FROM ALGORITHMS TO PROGRAMS

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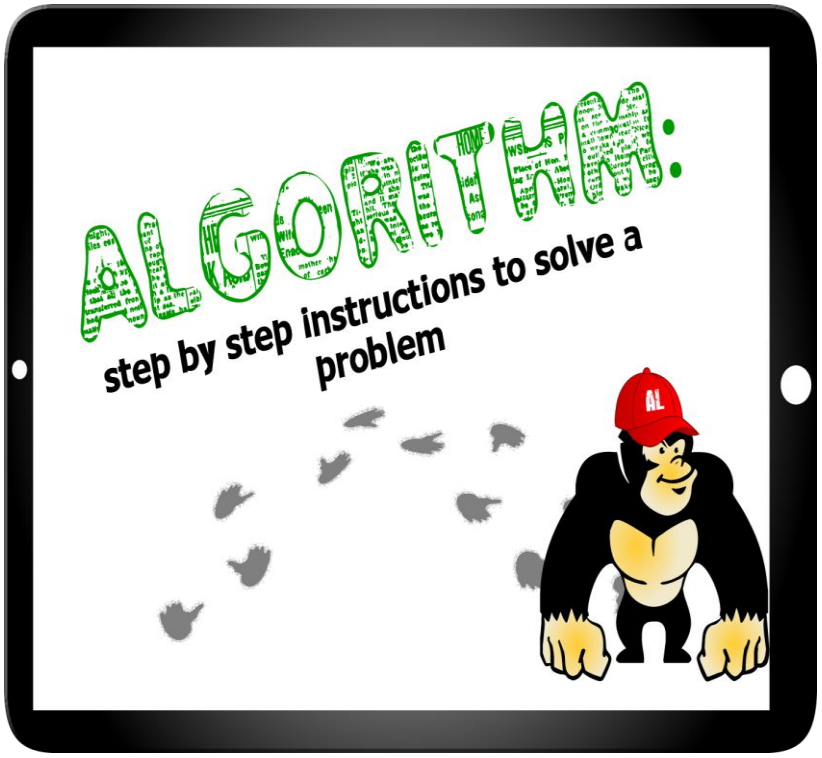
What is an algorithm?



- A sequence of instructions or set of rules
- When followed, will give desired results each time - like a card trick
- Written for people to understand, not computers!

Primary computing keywords posters created by Pete Dring

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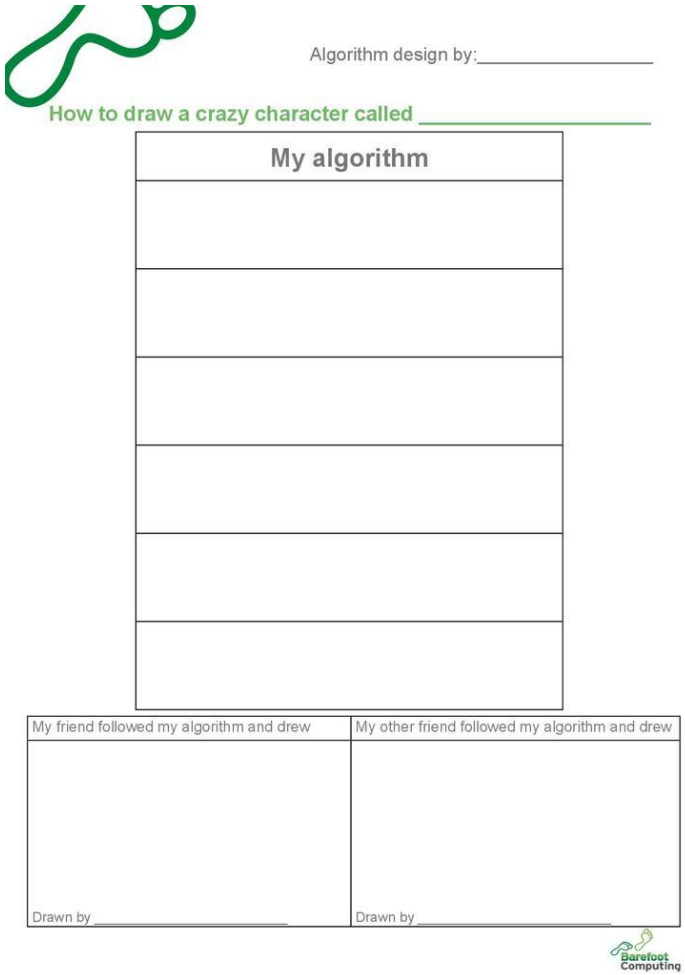
Unplugged

An activity by Barefoot Computing
www.barefootcomputing.org

1. Draw a triangular body
2. Draw 3 eyes
3. Draw 4 legs
4. Draw 1 antenna
5. Draw 2 wings



Background | Clear frame

Unplugged: Barefoot Crazy Character

1. Draw a triangular body
2. Draw 3 eyes
3. Draw 4 legs
4. Draw 1 antenna
5. Draw 2 wings

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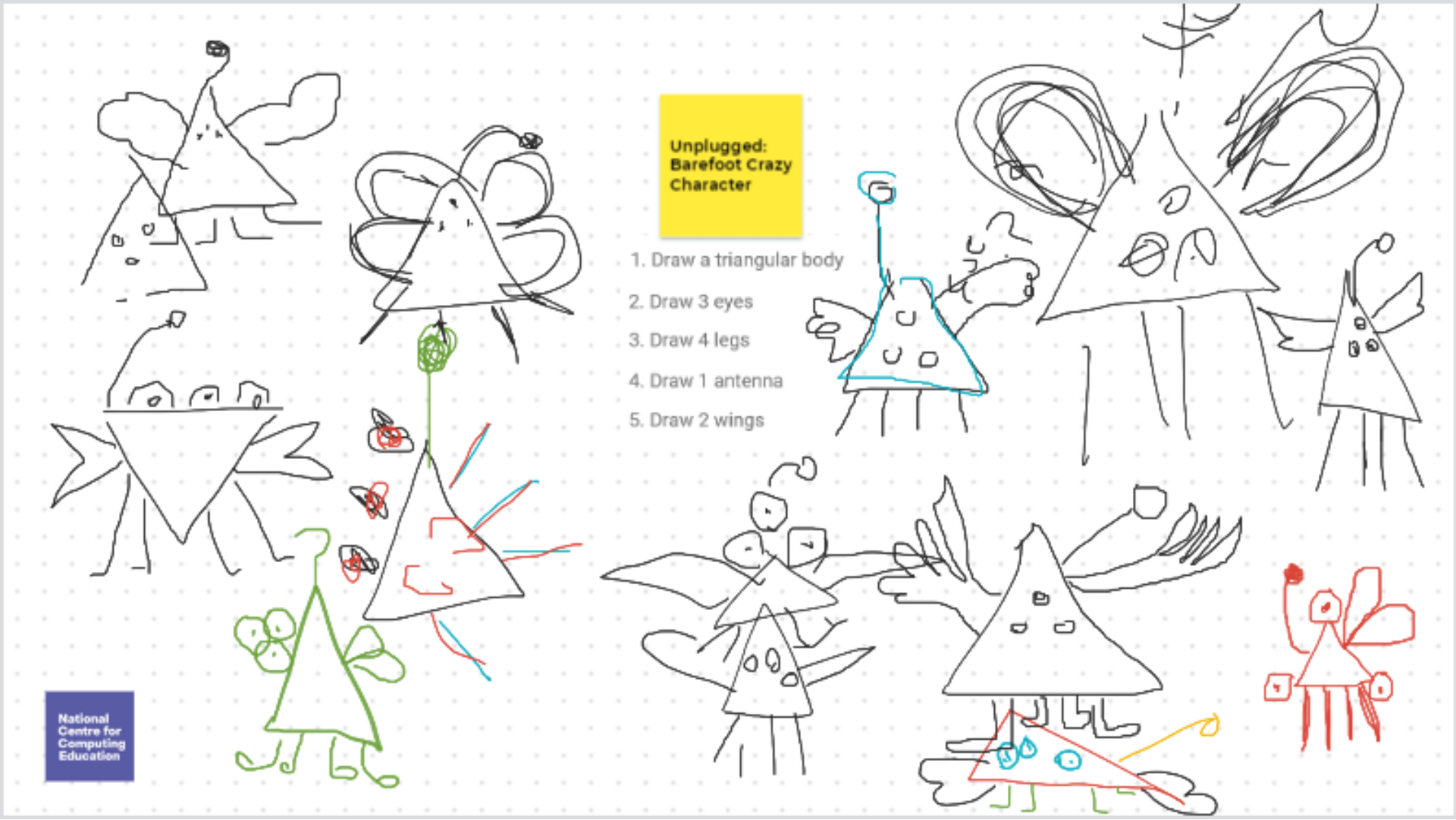

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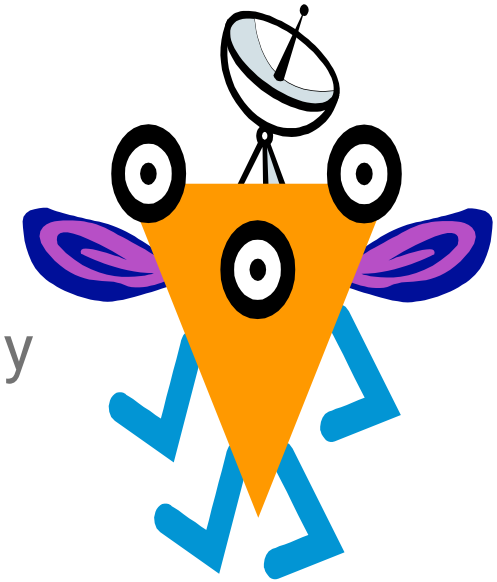
Education

Crazy Characters

An activity by Barefoot Computing
www.barefootcomputing.org



1. Draw an **inverted (upside down)** triangular body
2. Draw 3 eyes **one of these on each top corner and one in the middle**
3. Draw 3 legs **one on either side of the bottom point of the triangle and one on either side in the middle**
4. Draw 1 antenna **from the middle point of the top of the triangular body**
5. Draw 2 wings **perpendicular to the centre eye**

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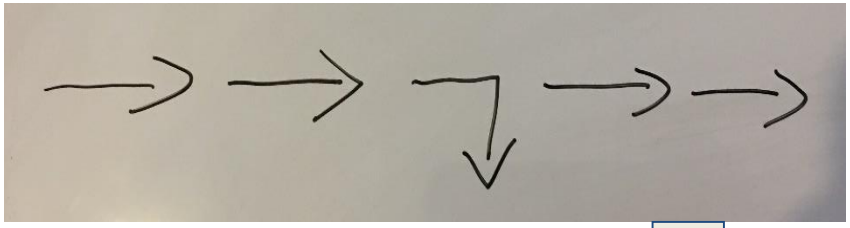
Transitioning from algorithms to programs (KS1)

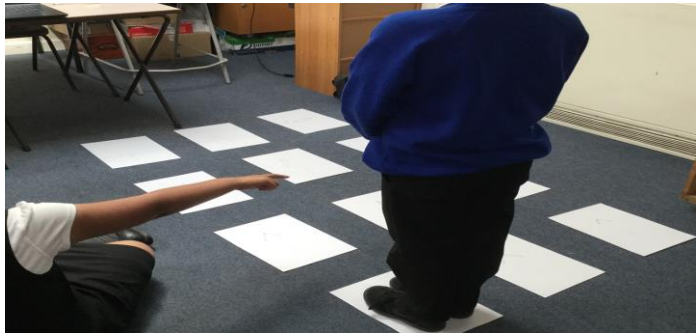
Bee-Bot symbols on a whiteboard



[Barefoot Bee-Bot resources]

Bee-Bot cards

[Code-it Bee-Bot resources]



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PROGRAMMING : SEQUENCING, REPETITION AND SELECTION

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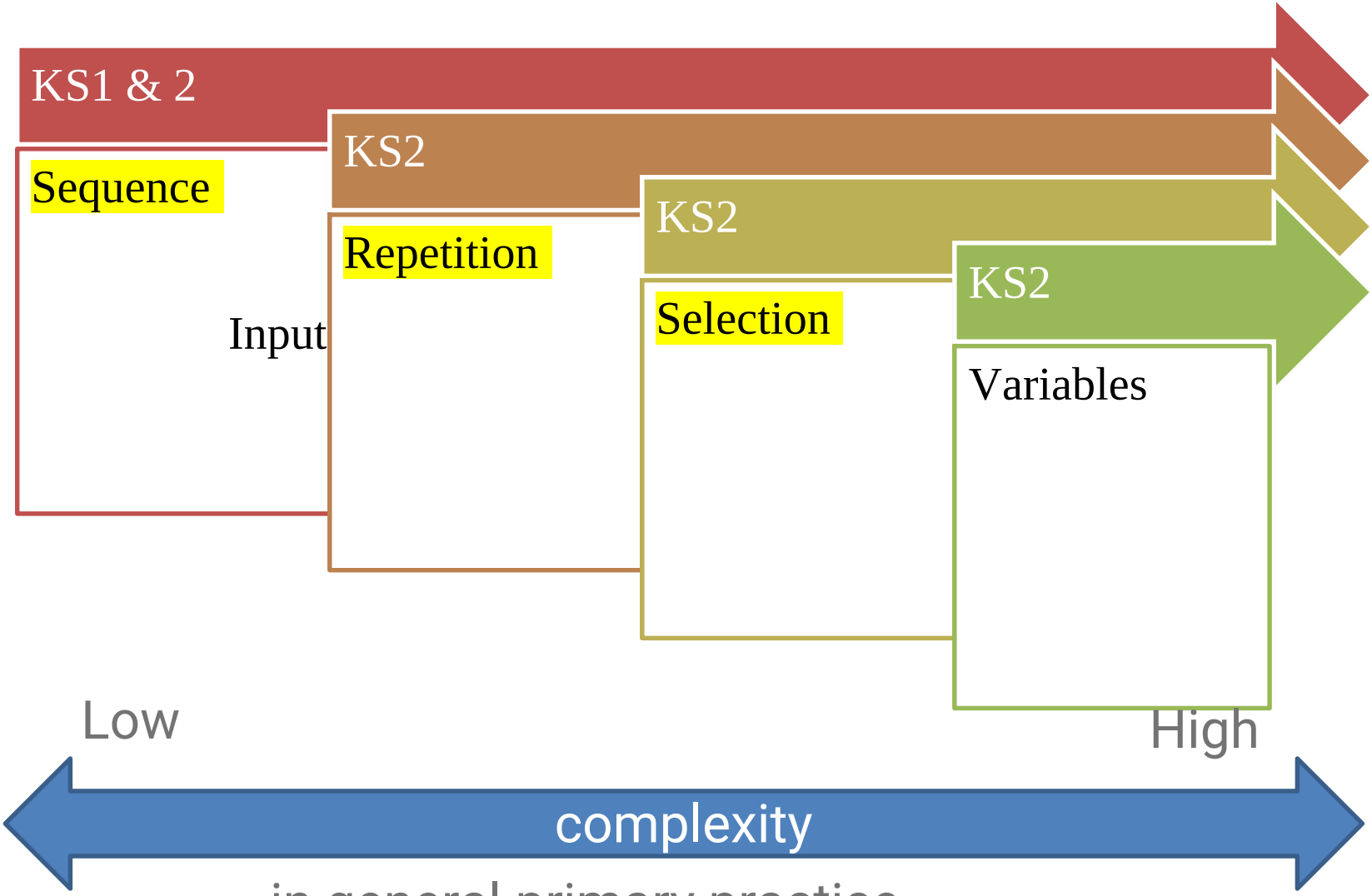
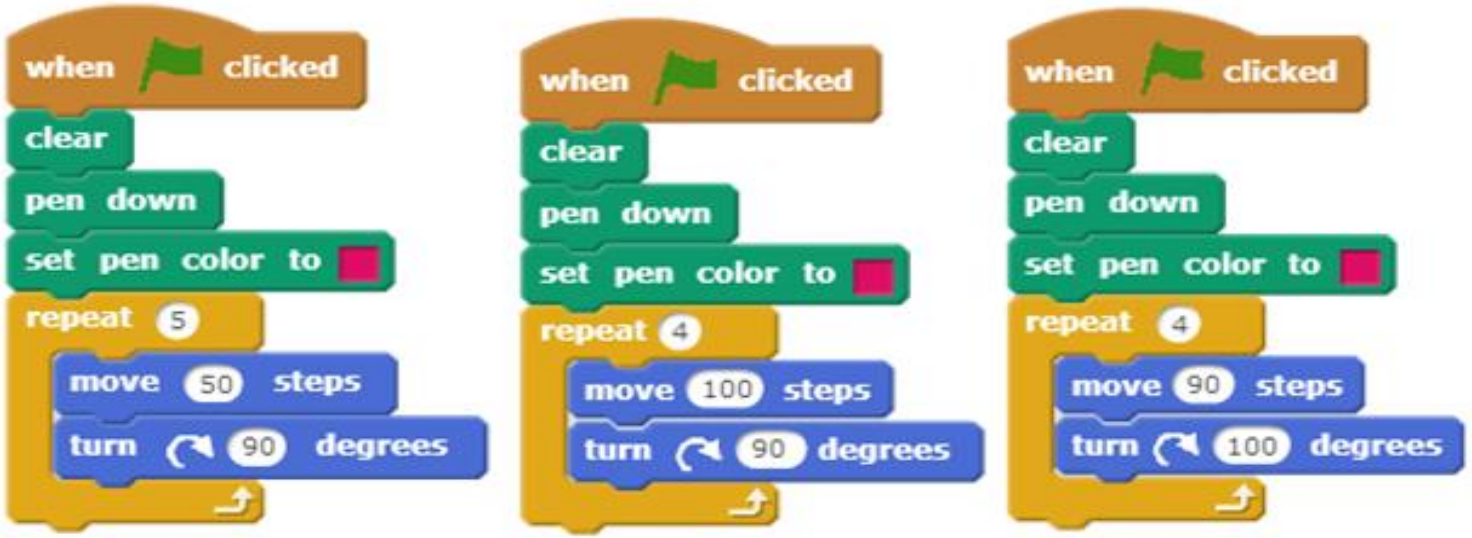

KS1 & 2
Sequence
KS2
Repetition
KS2
Selection
KS2
Variables
Input
Low
High
complexity
in general primary practice

Reading code

Learning a programming language is just like any other language … we first need to be able to read before we can write!!

Which program will create a square?



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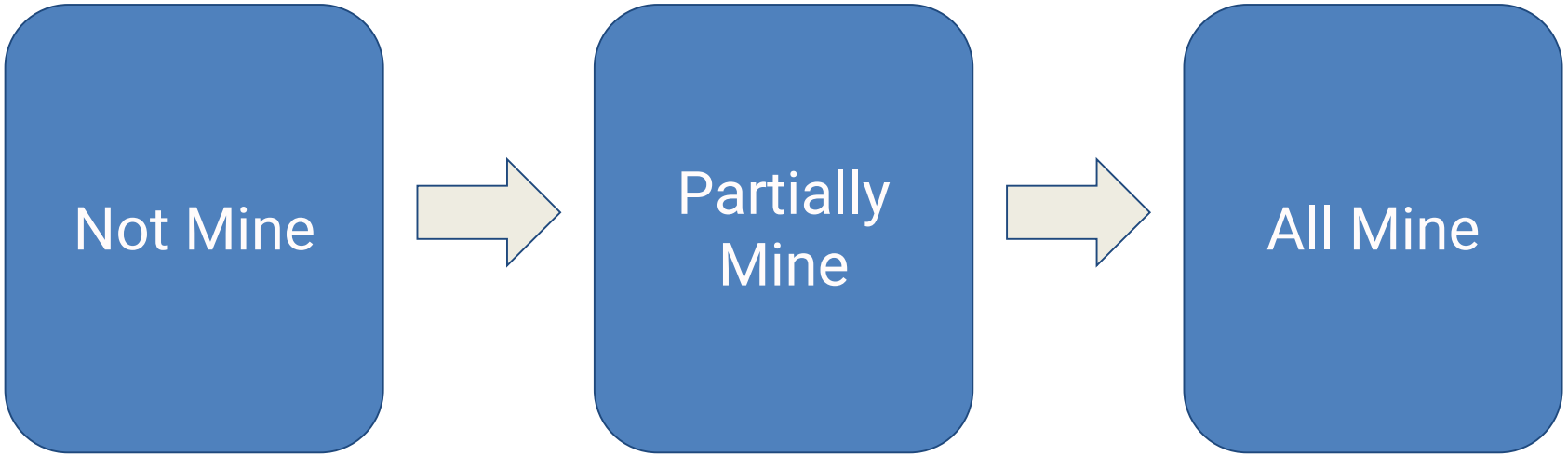
Pedagogy model for teaching programming effectively



Use - modify - create

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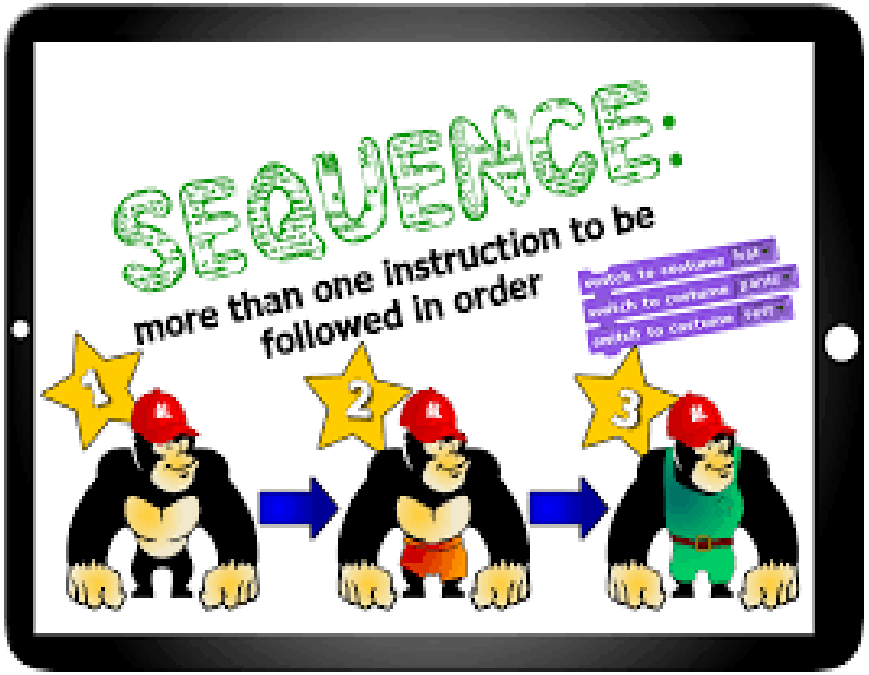
Sequencing



Primary computing keywords posters created by Pete Dring

- a sequence is the specific order in which instructions are performed within an algorithm

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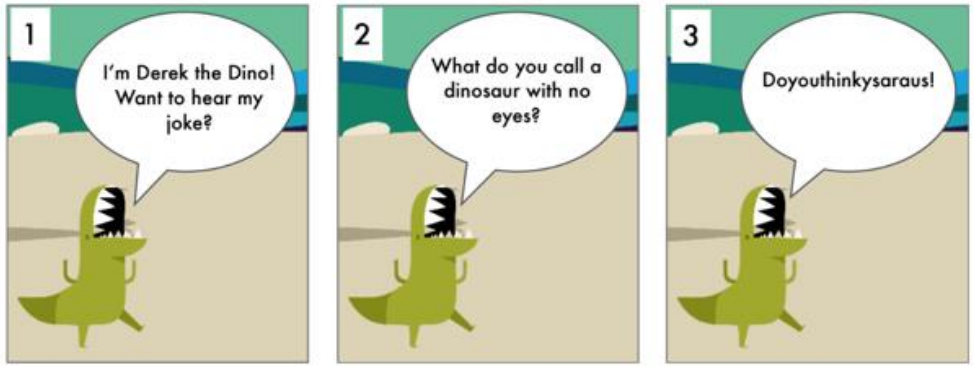
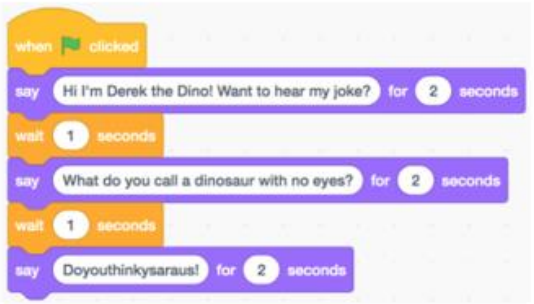
Sequencing

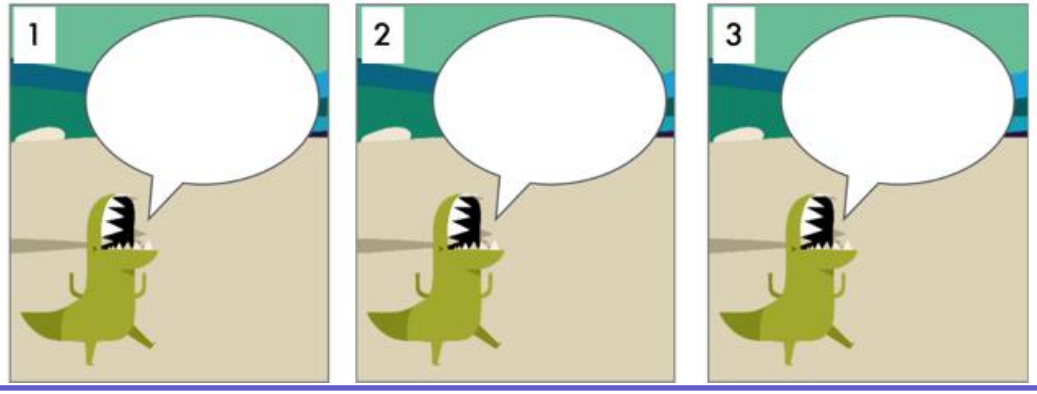
Create a design for your animation using the storyboard. The algorithm includes what you will say (you can add more boxes if you like).

Implement your algorithms as code using Scratch.





Your algorithm ...



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Planning a conversation in Scratch

Names:

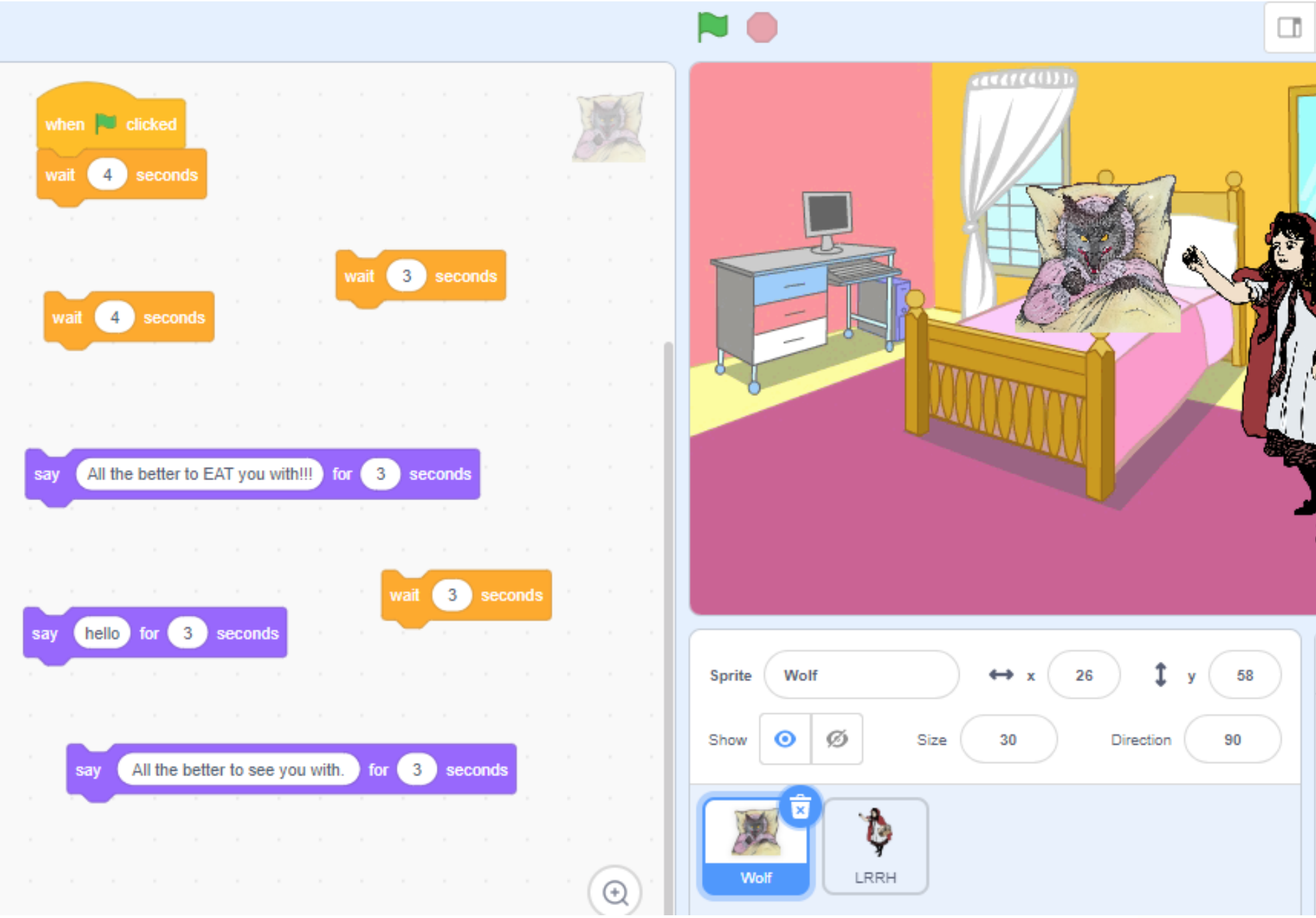
www.lttonline.net

Character: Little Red Riding Hood

	Speech / Command	Time (s)
LINE 1	say Oh, grandmother, your voice sounds so odd. Is something the matter? for	
	WAIT wait secs	3
LINE 2	say Oh, what big ears you have grandmother! for	4
	WAIT wait secs	
LINE 3	say And what big eyes you have! for	3
	WAIT wait secs	
LINE 4	say Oh, grandmother, and what big teeth you have! for	5
	WAIT wait secs	6
LINE 5	say for	
	WAIT wait secs	

Character: Grandmother

	Speech / Command	Time (s)
	WAIT wait secs	
LINE 1	say Oh, I just have a bit of a cold. for	
	WAIT wait secs	3
LINE 2	say All the better to hear you with. for	3
	WAIT wait secs	3
LINE 3	say All the better to see you with. for	
	WAIT wait secs	
LINE 4	say All the better to eat you with! Ha, ha, ha, ha, ha! for	
	WAIT wait secs	
LINE 5	say for	


when clicked
wait 4 seconds
wait 3 seconds
wait 4 seconds
say All the better to EAT you with!!! for 3 seconds
wait 3 seconds
say hello for 3 seconds
say All the better to see you with. for 3 seconds
Sprite Wolf
x 26
y 58
Show
Size 30
Direction 90
Wolf
LRRH

Cross curricular applications

- history : Code the dialogue between 2 main historical figures (e.g. Rosa Parks and the bus driver, Lord Carnavon and Howard Carter, Icarus and Daedalus ...).
- MFL : How about asking pupils to program a conversation in a different language? (Scratch online has a built in translation tool!)
- english : Code the key dialogue from two important characters within a text you are currently using in class

What ideas can you think of for your class ...?

Repetition

Primary computing keywords posters created by Pete Dring

Repetition means repeating a sequence of instructions a certain number of times, or until some specific result is achieved

Repetition

Scratch project here

13/05/20 | Shorifa Khanam

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Explore the Dancing Monster Scratch project. Notice how the sprite has different costumes to represent the 8 different dance moves that he can do.


Statue


Right arm raised


Headstand


The Hulk


Left arm raised


Teapot right


Teapot left


The Grizzly Bear

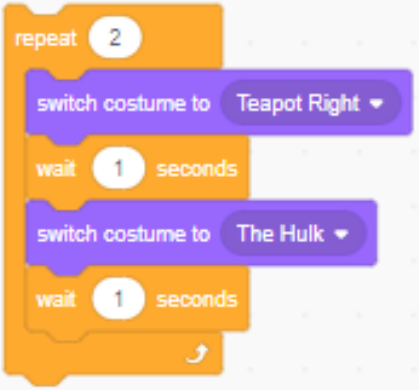
My algorithm ...

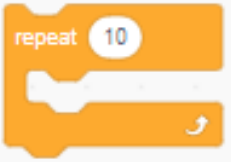
Example algorithm ...

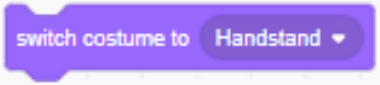
Repeat whole sequence **forever**

Repeat 2x
Teapot right
The Hulk

Repeat 2x
Left arm raised
Right arm raised







Explore the Dancing Monster Scratch project. Notice how the sprite has different costumes to represent the 8 different dance moves that he can do.


Statue


Right arm raised


Headstand


The Hulk


Left arm raised


Teapot right


Teapot left


The Grizzly Bear

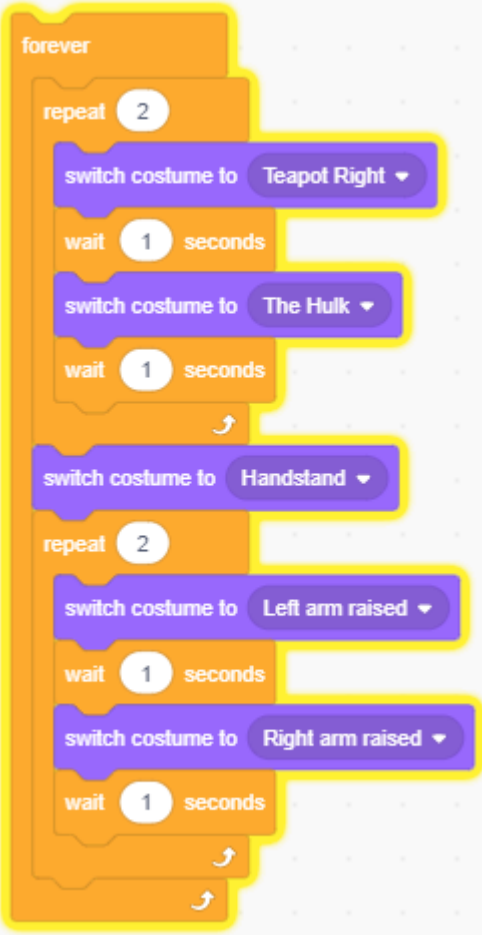
My algorithm ...

Example algorithm ...

Repeat whole sequence **forever**

Repeat 2x
Teapot right
The Hulk

Repeat 2x
Left arm raised
Right arm raised



Selection

Selection means a question is asked, and depending on the answer, the program takes one of two courses of action, after which the program moves on to the next event.

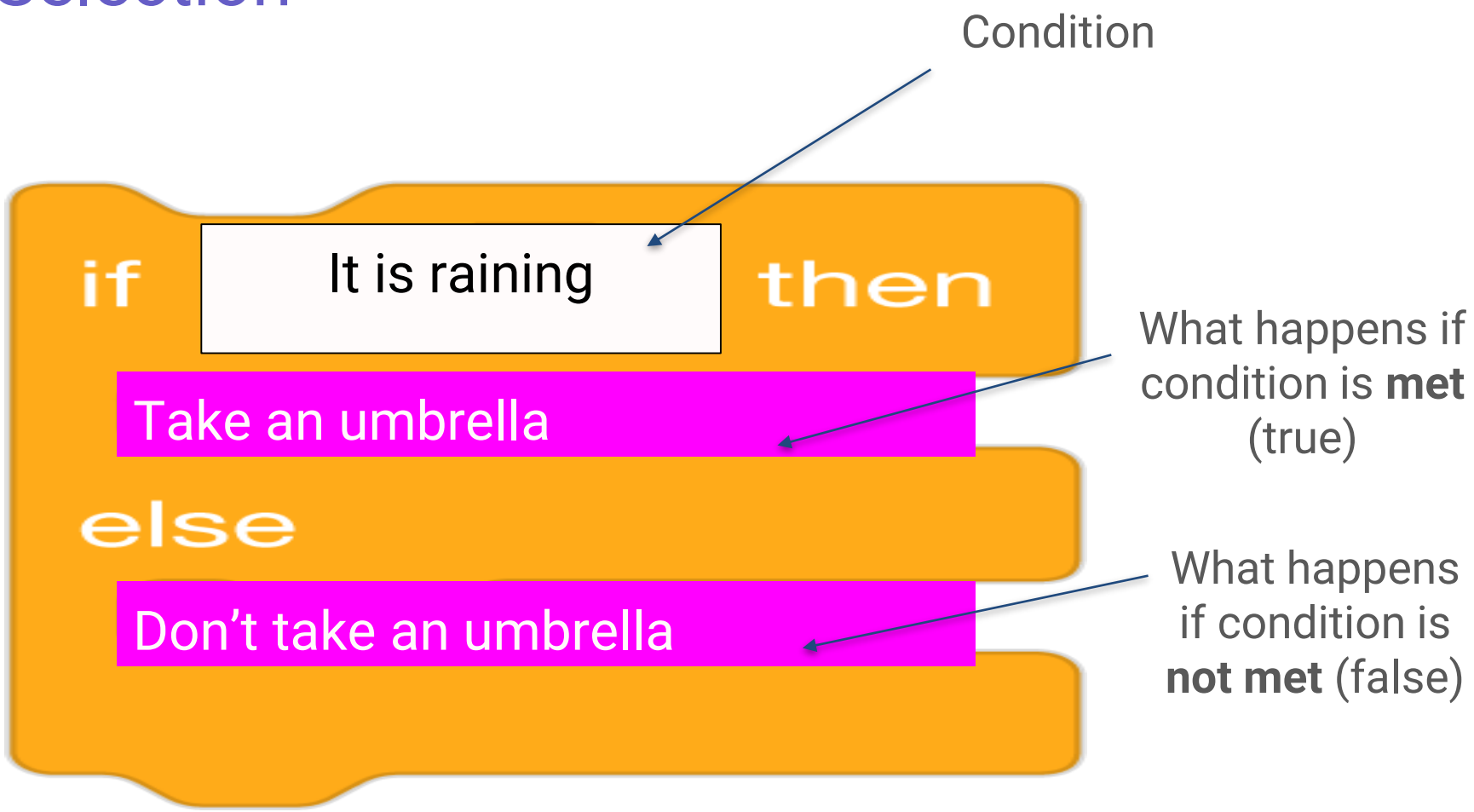
Selection

Scratch project here

Primary computing keywords posters created by Pete Dring

National Centre for Computing Education

Selection


Condition
if
It is raining
then
Take an umbrella
else
Don't take an umbrella
What happens if condition is **met** (true)
What happens if condition is **not met** (false)

Selection coding example

When the program is run, pose the question “what is 9 x 5”?

If the player responds with the correct answer say “Well done that is correct”

If the players response is incorrect say “Sorry that is incorrect”

Scratch selection project to view [here]

National Centre for Computing Education

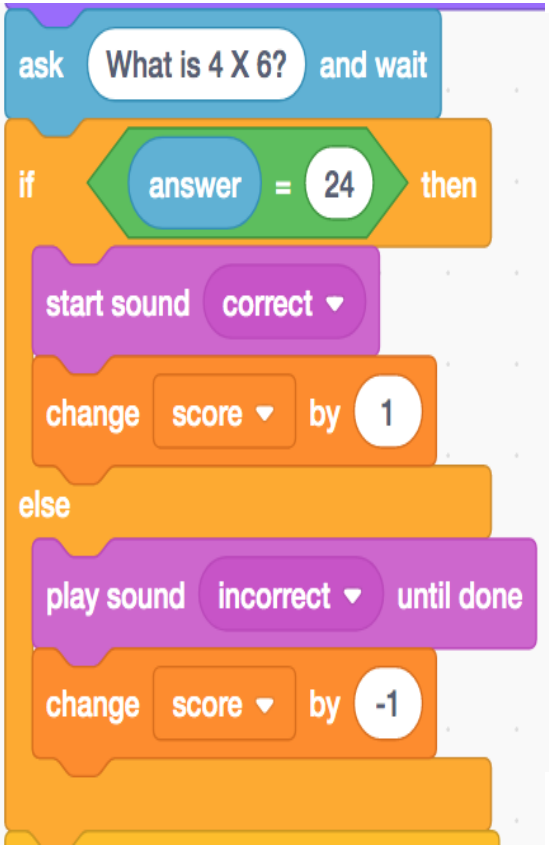
Debugging

- process of finding and fixing ‘bugs’
- use of ‘buggy code’ (deliberate errors)
- continual peer / self assessment to find and fix bugs

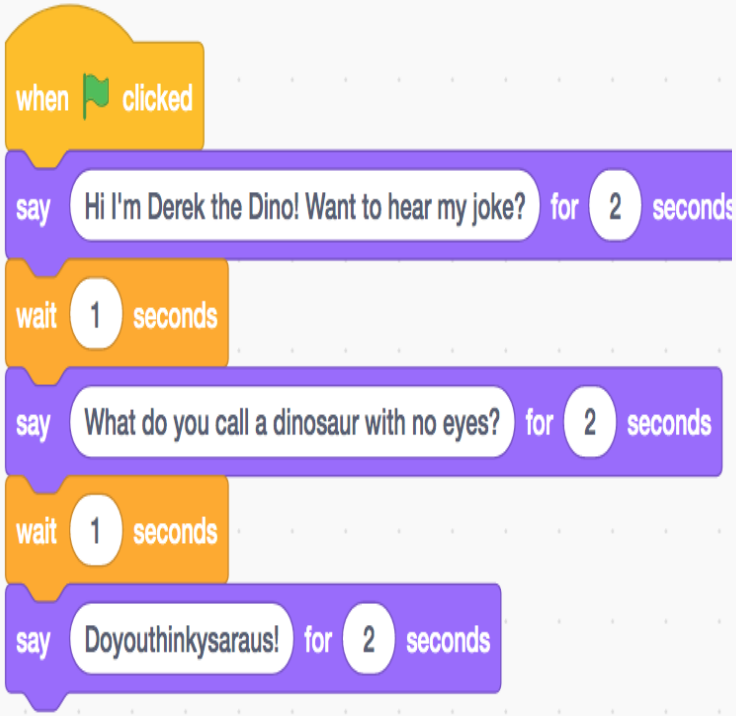
Primary computing keywords posters created by Pete Dring

Sequence, repetition or selection?

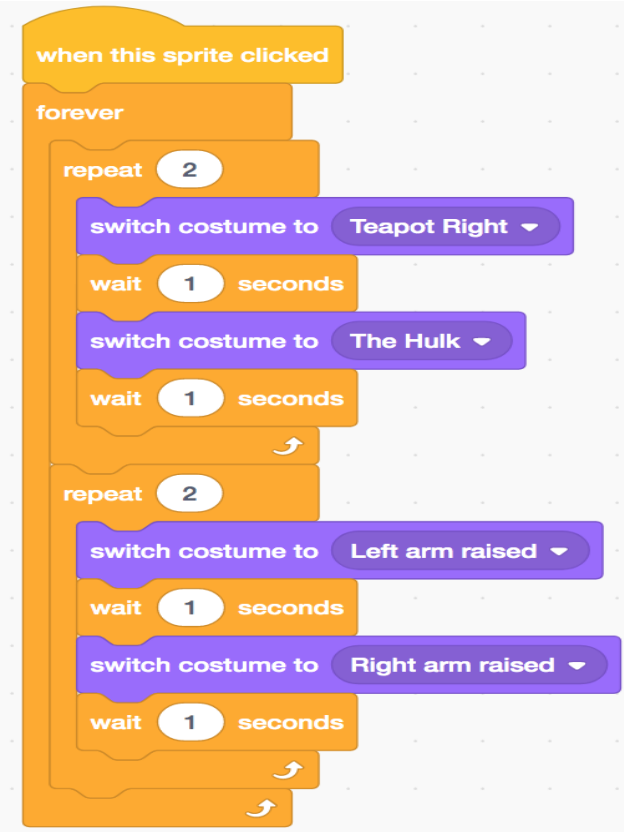
A



B



C



National Centre for Computing Education

Further useful resources

- NCCE ‘Primary programming and algorithms’ course
- teaching resources

… all available via teachcomputing.org

National Centre for Computing Education

The bigger picture

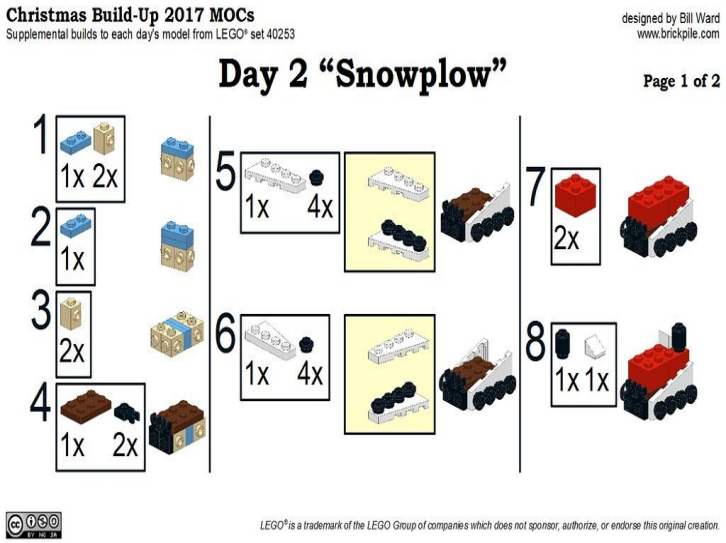
- 1st class Computer Science degree!

- how pupils learn
- how to sequence progressive lessons
- how to present new information in a variety of ways
- how to diagnosis misunderstandings
- how to give children opportunities to apply their understanding
- how to support all learners
- **a better understanding of the computing curriculum, the underlying principles of computational thinking and some practical experience of teaching programming effectively**

National Centre for Computing Education

The bigger picture

Which is the greater achievement?



or

image source :
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Image source:
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SUPPORT NETWORKS

What support is available to you as you move forward in your teaching / leading of computing?

National Centre for Computing Education

What is the NCCE?

STEM LEARNING

Raspberry Pi

bcs The Chartered Institute for IT

Drawing on their strengths, each organisation in the consortium is leading on different aspects of the NCCE

National Centre for Computing Education

Teach Computing

KS1-4

isaac computer science

KS5

“Our vision is for every child in every school in England to have a world-leading computing education”

Our Vision

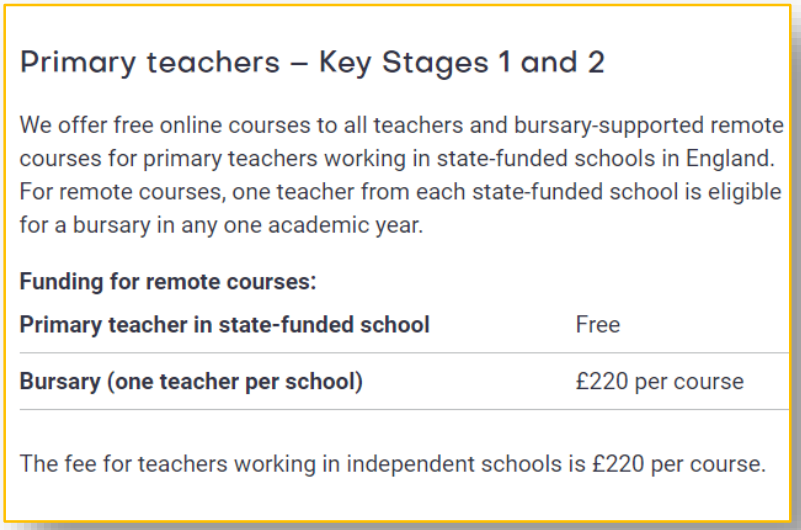
National Centre for Computing Education

Primary TeachComputing Courses

- **Teaching and leading key stage 1 computing - Module 1 & Module 2**
- **Teaching and leading key stage 2 computing - Module 1 & Module 2**
- **Introduction to primary computing**
- **Primary Programming and algorithms**

Upcoming:

- **Computing for new subject coordinators**
- **Closing the gap - outstanding primary computing for all**



Primary teachers – Key Stages 1 and 2

We offer free online courses to all teachers and bursary-supported remote courses for primary teachers working in state-funded schools in England. For remote courses, one teacher from each state-funded school is eligible for a bursary in any one academic year.

Funding for remote courses:

Primary teacher in state-funded school	Free
Bursary (one teacher per school)	£220 per course

The fee for teachers working in independent schools is £220 per course.

https://teachcomputing.org/primary-teachers

Secondary TeachComputing Courses

Includes:

- **Key Stage 3 computing for the non-specialist teacher**

Upcoming:

- **New to secondary computing subject leadership**
- **Bridging the Gender Gap**

Secondary teachers – Key stages 3 and 4

For Key Stage 3 and 4 pedagogy, we offer free online courses to all teachers and free remote courses for teachers working in state-funded education.

Course fees for remote CPD:

State-funded schools	Free
Independent schools	£220 per day

Teachers who have completed the Computer Science Accelerator Programme are eligible to attend all our CPD for free. Details will be sent on successful completion of the programme.

Computer Science Accelerator Programme

- Highly personalised, modular programme, to improve GCSE **subject knowledge**
- **Diagnostic test** to help identify gaps in knowledge
- Live remote CSA course + 1 other course = 10 hours
- Short summative **assessment**
- Gain **certification** in GCSE **Subject Knowledge**
- Schools and colleges receive **bursary** per teacher **£920**

Secondary teachers – GCSE level

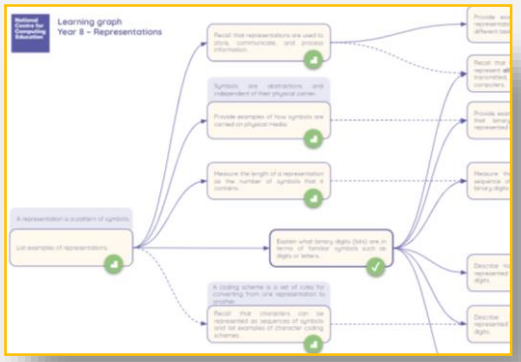
The Computer Science Accelerator Programme offers free online courses to all teachers and free remote courses for teachers in state-funded education.

Secondary teachers working in state-funded education are eligible for a bursary of £920, paid to your school or college, as shown in the table below.

Bursary allocation	Your school will receive:
Complete the programme and pass final test	£620
Additional funding for classroom practice	£300
Total bursary	£920

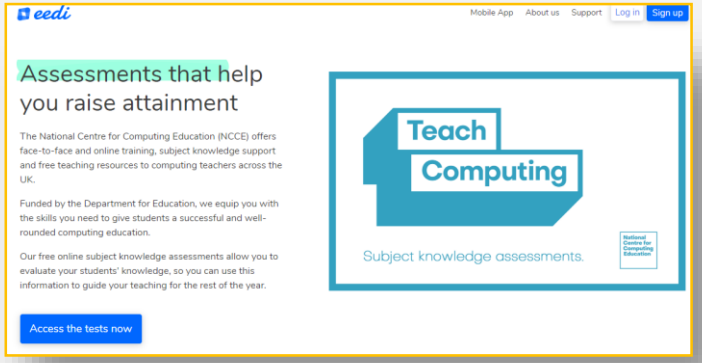
Resource Repository

teachcomputing.org/resources



Subject Knowledge Assessments

https://www.eedi.co.uk/projects/teach-computing

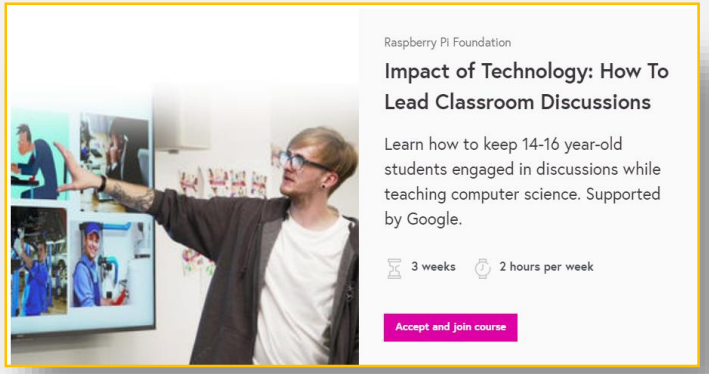


Certification

teachcomputing.org/primary-certificate

Online Courses

https://teachcomputing.org/courses



Resource Repository

World-class lesson plans, unit guides and teacher guides to help you **teach computing**.

- ➔ A comprehensive collection of material to support 500 hours of teaching materials, facilitating the delivery of the computing curriculum Key Stages 1 to 4 (5-16 year-olds).
- ➔ All resource repository content is free, and editable (Open Government License (OGL)) ensuring the resources can be tailored to each individual teacher and school setting.
- ➔ Suitable for all students regardless of their ability, background and additional needs.
- ➔ All content launched by July 2020.

teachcomputing.org/resources

Resource Repository

World-class lesson plans, unit guides and teacher guides to help you **teach computing**.

Each unit includes:

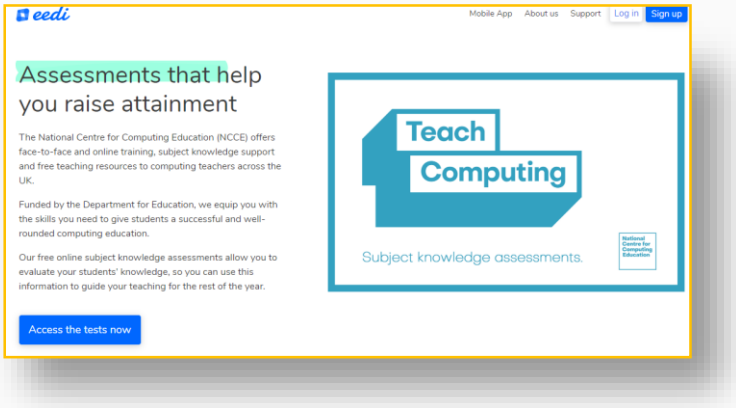
- ➔ **Lesson Plans** -- 6 per unit (approx.): Step-by-step plans, outlining the delivery of a single one hour lesson to students of varied abilities.
- ➔ **Slides** -- one per lesson, for use by the classroom teacher.
- ➔ **Homework** -- 2 (approx.) per unit: Follow up work to be done either to extend or assess students' learning
- ➔ **Individual Activities** -- multiple per lesson plan
- ➔ **Progression mapping** -- a visual representation of the stages encountered by learners within a particular topic and the structure of these stages, i.e. the relations between them.
- ➔ **Assessment** -- A multiple choice end of unit summative quiz, and formative assessment throughout.
- ➔ **Pedagogy** -- Based on most up to date research in delivering good computing lessons.

teachcomputing.org/resources

Subject Knowledge Assessments

Comprehensive assessment suite for KS3 Computing and GCSE computer science.

The quality-assured short online tests, collectively known as NCCE Subject Knowledge Assessments, cover the breadth and depth of the curriculum, and will allow teachers to accurately assess the subject knowledge of their students, using the popular Eedi platform.



- ➔ Algorithms
- ➔ Data & Information
- ➔ Design & Development
- ➔ Programming
- ➔ Computer Systems
- ➔ Computer Networks
- ➔ Creating Media
- ➔ Effective Use of Tools
- ➔ Safety & Security
- ➔ Impact of Technology

https://www.eedi.co.uk/projects/teach-computing

Primary Certification

Complete

- ➔ One F2F course/remote live course
- ➔ One online course
- ➔ Contribute to online discussion (CAS forum)

Plus 1 of:

- ➔ Host or attend Barefoot Workshop
- ➔ Attend CAS CoP meeting
- ➔ Review a resource on CAS

Plus 1 of:

- ➔ Lead a session at a regional/national conference
- ➔ Run an after school code club
- ➔ Lead a CAS CoP

teachcomputing.org/primary-certificate

Your Local Hub(s)

Hubs and Areas covered

- ➔ Network of up to 40 Computing Hubs based in secondary school nationwide
- ➔ providing local, responsive and appropriately tailored support to all computing teachers in state primary and secondary schools and colleges in their area
- ➔ the focal point for local computing CPD, drawing upon local expertise to provide a range of CPD opportunities for all teachers, particularly in category 5 and 6 Local Authority Districts

School Engagement Programme

- **Subject Matter Experts** engaging with schools and colleges that require support:
  - ‘Non-GCSE’ Schools*
  - Priority Schools (LAD 5 & 6)

*
- *Schools that do not offer GCSE computer Science currently,*
- *including schools who have dropped it recently*
- *Schools who are at risk of dropping GCSE*
- *Recent adopters (criteria to be met)*

Priority School Support

➔ Heads of Dept. and Teachers

Analyse the needs of the department

Discuss possible support over the coming years

➔ Create a department action plans

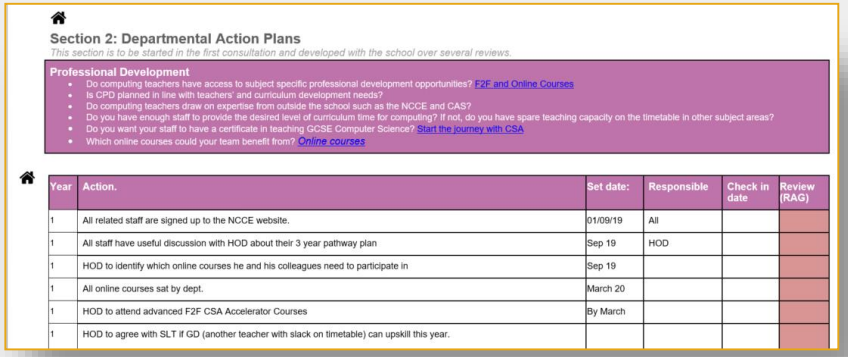
➔ Create teacher CPD plans

➔ Support school in the action plan

0.5days

With other schools with similar need

➔ SME will support this year, department will have a 3 year plan.



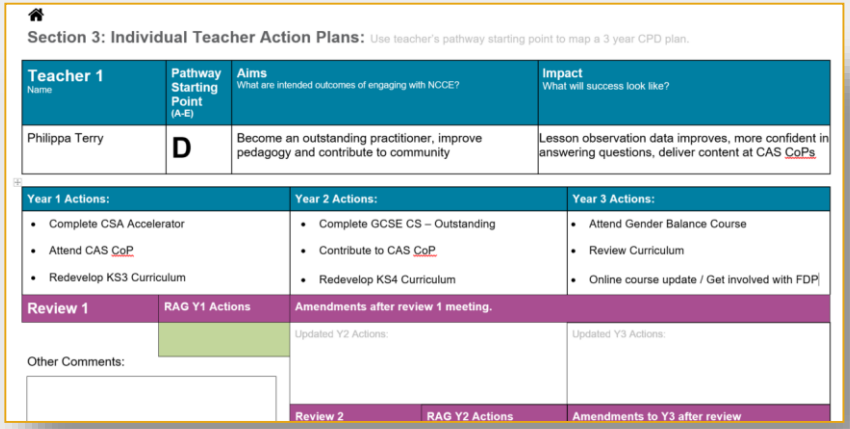
Section 2: Departmental Action Plans

This section is to be started in the first consultation and developed with the school over several reviews.

Professional Development

- Do computing teachers have access to subject specific professional development opportunities? F2F and Online Courses
- Is CPD planned in line with teachers' and curriculum development needs?
- Do computing teachers draw on expertise from outside the school such as the NCCE and CAS?
- Do you have enough staff to provide the desired level of curriculum time for computing? If not, do you have spare teaching capacity on the timetable in other subject areas?
- Do you want your staff to have a certificate in teaching GCSE Computer Science? Start the journey with CSA
- Which online courses could your team benefit from? *Online courses*

Year	Action.	Set date:	Responsible	Check in date	Review (RAG)
1	All related staff are signed up to the NCCE website.	01/09/19	All		
1	All staff have useful discussion with HOD about their 3 year pathway plan	Sep 19	HOD		
1	HOD to identify which online courses he and his colleagues need to participate in	Sep 19			
1	All online courses sat by dept.	March 20			
1	HOD to attend advanced F2F CSA Accelerator Courses	By March			
1	HOD to agree with SLT if GD (another teacher with slack on timetable) can upskill this year.				



Section 3: Individual Teacher Action Plans: Use teacher's pathway starting point to map a 3 year CPD plan.

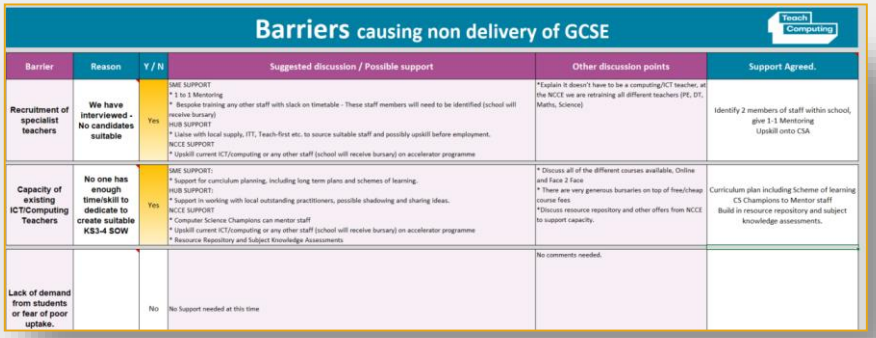
Teacher 1 Name	Pathway Starting Point (A-E)	Aims What are intended outcomes of engaging with NCCE?	Impact What will success look like?
Philippa Terry	D	Become an outstanding practitioner, improve pedagogy and contribute to community	Lesson observation data improves, more confident in answering questions, deliver content at CAS CoPs

Year 1 Actions:	Year 2 Actions:	Year 3 Actions:
• Complete CSA Accelerator • Attend CAS CoP • Redevelop KS3 Curriculum	• Complete GCSE CS – Outstanding • Contribute to CAS CoP • Redevelop KS4 Curriculum	• Attend Gender Balance Course • Review Curriculum • Online course update / Get involved with FDP

Review 1	RAG Y1 Actions	Amendments after review 1 meeting.	
Other Comments:		Updated Y2 Actions:	Updated Y3 Actions:
		Review 2	RAG Y2 Actions / Amendments to Y3 after review

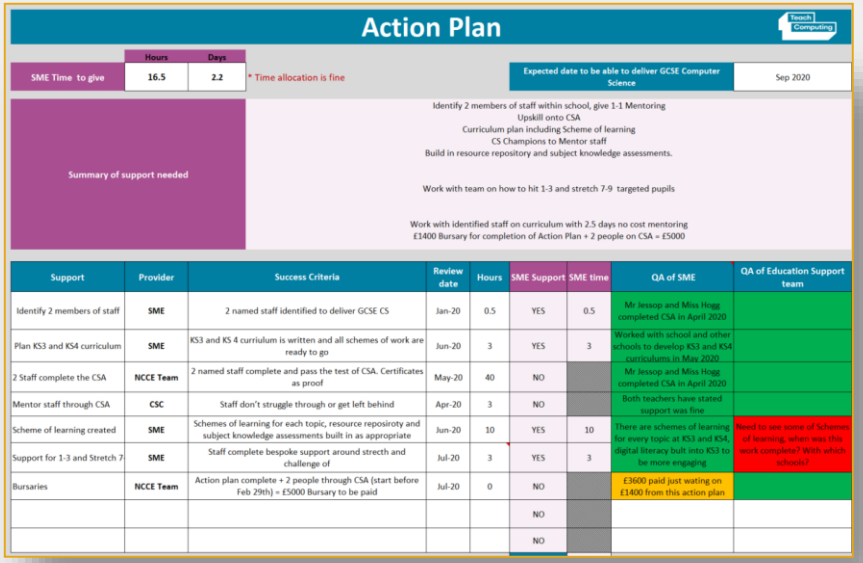
Non GCSE Support

- ➔ SMEs work with Senior Leaders and HOD, using a dedicated Toolkit
- ➔ Analyse the reasons for not offering(barrier) - Discuss possible support to remove barriers
- ➔ Create an action plan
- ➔ Support school in the action plan
  - ◆ 4 - 9 months is suggested time-frame of support on the action plan



Barriers causing non delivery of GCSE

Barrier	Reason	Y / N	Suggested discussion / Possible support	Other discussion points	Support Agreed.
Recruitment of specialist teachers	We have interviewed - No candidates suitable	Yes	SME SUPPORT * 1 to 1 Mentoring * Bespoke training any other staff with slack on timetable - These staff members will need to be identified (school will receive bursary) HUB SUPPORT * Liaise with local supply, ITT, Teach-first etc. to source suitable staff and possibly upskill before employment. NCCE SUPPORT * Upskill current ICT/computing or any other staff (school will receive bursary) on accelerator programme	*Explain it doesn't have to be a computing/ICT teacher, at the NCCE we are retraining all different teachers (PE, DT, Maths, Science)	Identify 2 members of staff within school, give 1-1 Mentoring Upskill onto CSA
Capacity of existing ICT/Computing Teachers	No one has enough time/skill to dedicate to create suitable KS3-4 SOW	Yes	SME SUPPORT: * Support for curriculum planning, including long term plans and schemes of learning. HUB SUPPORT: * Support in working with local outstanding practitioners, possible shadowing and sharing ideas. NCCE SUPPORT * Computer Science Champions can mentor staff * Upskill current ICT/computing or any other staff (school will receive bursary) on accelerator programme * Resource Repository and Subject Knowledge Assessments	* Discuss all of the different courses available, Online and Face 2 Face * There are very generous bursaries on top of free/cheap course fees *Discuss resource repository and other offers from NCCE to support capacity.	Curriculum plan including Scheme of learning CS Champions to Mentor staff Build in resource repository and subject knowledge assessments.
Lack of demand from students or fear of poor uptake.		No	No Support needed at this time	No comments needed.	



Action Plan

	Hours	Days			
SME Time to give	16.5	2.2	* Time allocation is fine	Expected date to be able to deliver GCSE Computer Science	Sep 2020

Summary of support needed:

Identify 2 members of staff within school, give 1-1 Mentoring
Upskill onto CSA
Curriculum plan including Scheme of learning
CS Champions to Mentor staff
Build in resource repository and subject knowledge assessments.

Work with team on how to hit 1-3 and stretch 7-9 targeted pupils

Work with identified staff on curriculum with 2.5 days no cost mentoring
£1400 Bursary for completion of Action Plan + 2 people on CSA = £5000

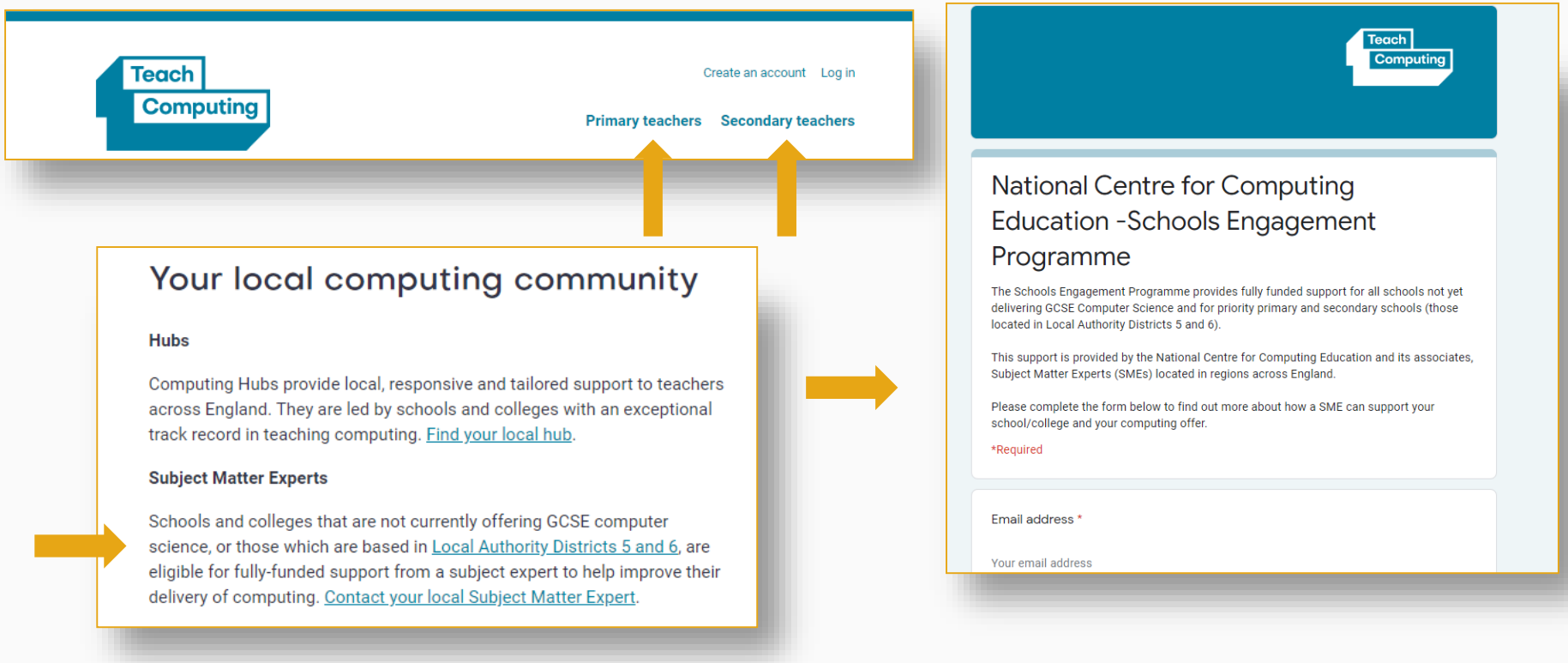
Support	Provider	Success Criteria	Review date	Hours	SME Support	SME time	QA of SME	QA of Education Support team
Identify 2 members of staff	SME	2 named staff identified to deliver GCSE CS	Jan-20	0.5	YES	0.5	Mr Jessop and Miss Hogg completed CSA in April 2020	
Plan KS3 and KS4 curriculum	SME	KS3 and KS 4 curriculum is written and all schemes of work are ready to go	Jun-20	3	YES	3	Worked with school and other schools to develop KS3 and KS4 curriculums in May 2020	
2 Staff complete the CSA	NCCE Team	2 named staff complete and pass the test of CSA. Certificates as proof	May-20	40	NO		Mr Jessop and Miss Hogg completed CSA in April 2020	
Mentor staff through CSA	CSC	Staff don't struggle through or get left behind	Apr-20	3	NO		Both teachers have stated support was fine	
Scheme of learning created	SME	Schemes of learning for each topic, resource reposiroty and subject knowledge assessments built in as appropriate	Jun-20	10	YES	10	There are schemes of learning for every topic at KS3 and KS4, digital literacy bult into KS3 to be more engaging	Need to see some of Schemes of learning, when was this work complete? With which schools?
Support for 1-3 and Stretch 7	SME	Staff complete bespoke support around strecth and challenge of	Jul-20	3	YES	3		
Bursaries	NCCE Team	Action plan complete + 2 people through CSA (start before Feb 29th) = £5000 Bursary to be paid	Jul-20	0	NO		£3600 paid just wating on £1400 from this action plan	
					NO			
					NO			

What an SME can support you with.

- ➔ Supporting teachers who want to **convert/upskill**
- ➔ Guiding teachers - relevant **courses**, **resources** and **communities**.
- ➔ Support on **curriculum intent and implementation**
- ➔ **Schemes of work** and equivalent.
- ➔ Bespoke **subject knowledge** support
- ➔ **Infrastructure** and **software** guidance
- ➔ **Physical programming** support
- ➔ **Multi-school** support
- ➔ **Raising profile** of subject
- ➔ Raising **engagement of girls**
- ➔ Plus ***much more***.

How do I request support?

➔ There is a form you can complete from teachcomputing.org website:



CAS communities of practice

Computing at School

- meet at least once a term
- provide at least one resource for the teachers attending to use in their classroom
- have a theme or topic relevant to teachers of computing
- enable teachers to collaborate on a task or activity - to "have a go"
- provide opportunity for teachers to chat and network with each other

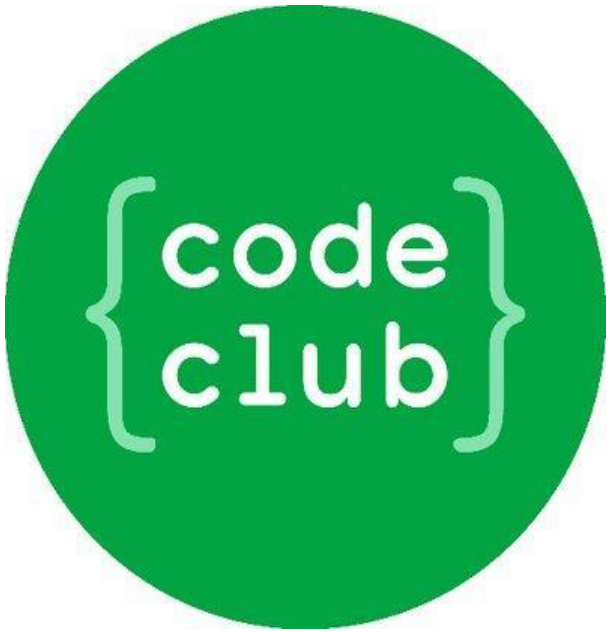
computingatschool.org.uk

Barefoot ambassadors/volunteers

- barefoot computing provide simple, accessible resources to help deliver the primary computing curriculum effectively www.barefootcomputing.org

- schools can request a free CPD workshop for their school, where trained volunteers will take Barefoot straight into their classroom.

Volunteers



- international network of free, volunteer-led after school coding clubs for children aged 9-13
- sign up on the website www.codeclub.org fill in your school details and tick the box to request a volunteer to contact you

Volunteers

- an exciting free resource for teachers and others engaging with young people inside and out of the classroom
- register from the STEM website www.stem.org.uk/stem-ambassadors to find a STEM Ambassador

National Centre for Computing Education

Social Media

- Twitter #CASchat every Tuesday 8 - 9pm

- Primary Computing coordinators Facebook group (over 2000 members)

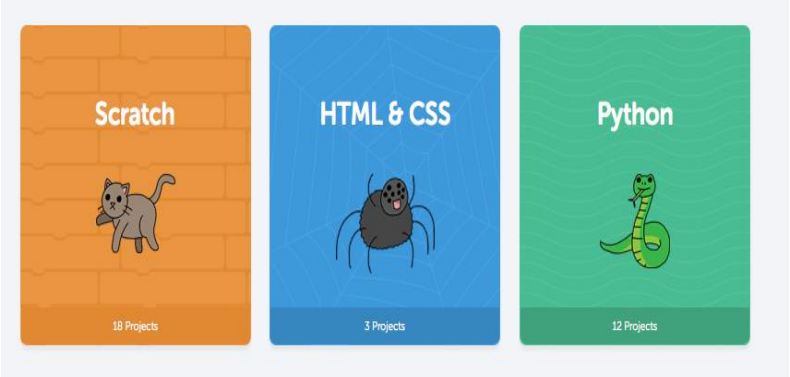
National Centre for Computing Education

RESOURCES TOOLKIT

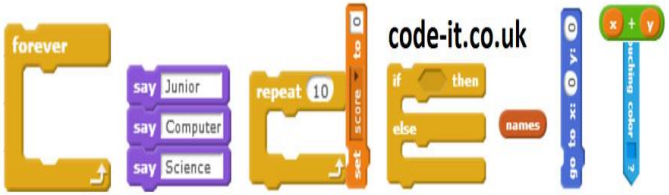
13/05/20 | Shorifa Khanam
National Centre for Computing Education

National Centre for Computing Education

Useful go to resources ...



HOUR OF CODE



National Centre for Computing Education

teachcomputing.org/resources

CAS Barefoot

Supported by BT

National Centre for Computing Education

Useful Links

NCCE Website: https://teachcomputing.org/
NCCE Primary: https://teachcomputing.org/primary-teachers
NCCE Resources: https://teachcomputing.org/resources
NCCE Bursaries: https://teachcomputing.org/bursary
NCCE SME Support: https://docs.google.com/forms/d/e/1FAIpQLSeSmjJgi5jsUI0u6AxUR-FmEkudj-jgeGYLAVumaHgxGilEIw/viewform
Raspberry Pi: https://www.raspberrypi.org/
Barefoot Computing: https://www.barefootcomputing.org/
Code Club: https://codeclub.org/en/
CAS: https://www.computingatschool.org.uk/
Stem Ambassadors: https://www.stem.org.uk/stem-ambassadors
Code It: http://code-it.co.uk/philbagge
Hour of Code: https://hourofcode.com/uk
Quickstart Computing Primary: https://community.computingatschool.org.uk/resources/3042/single#v1
Scratch: https://scratch.mit.edu/
The Royal Society: https://royalsociety.org/topics-policy/projects/computing-in-schools/report/

Intended learning outcomes

By the end of this session you will be able to:

- identify the three strands of the curriculum, considering what kinds of activities fit into each
- support pupils to develop computational thinking skills
- show more confidence in teaching the ‘Big 3’ programming concepts of sequence, repetition, and selection.
- find the wealth of resources, support and fully funded CPD available from the National Centre for Computing Education (NCCE).

National Centre for Computing Education

Next steps

Following this course there are a number of further opportunities. These include

- further NCCE courses that build on this one
- computing at School communities and forums
- primary Computing courses at Futurelearn
- Barefoot courses and resources
- forums and advice via STEM Learning
- ideas and materials via the Raspberry Pi Foundation

Teach Computing

National Centre for Computing Education

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Introduction to Primary Computing

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