



ICT and Computing Curriculum 2014

Computing Curriculum Subject Content		
	Key Stage One	Key Stage Two
Computer Science	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</p> <p>Create and debug simple programs</p> <p>Use logical reasoning to predict the behaviour of simple programs</p>	<p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p>
Information Technology	<p>Recognise common uses of information technology beyond school</p> <p>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</p>	<p>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour</p>
Digital Literacy	<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content</p> <p>Recognise common uses of information technology beyond school</p>	<p>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</p> <p>select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p>

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**Computer
Science**

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



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Computer Science – Project Ideas and

Beebots



2DIY 3D Purplemash Resources



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

iPad app: Daisy the Dino



Key Ideas

- What kind of objects do we control at home? (e.g. washing machine, microwave etc..) how do the machines know what to do? (Through a computer program or algorithm)
- What computer games do you like? What makes them exciting? Who makes them and how?
- What do you think will happen if.. did it do what you expected it to?
- Why do you think that doesn't work? How could you check the instructions?

Ideas - Example Cross Curricular Computer Science Project

Literacy/Art/Computing/Geography Project

- Make and label a treasure map in art/literacy/geography
- Plan an adventure story using video camera on iPads to practise
- Write instructions to send the Beebots on a treasure hunt
- Did your Beebot go where you wanted it to? Can you work with your partner to check the instructions (the algorithm) for mistakes?

Explaining the Resources

The school subscribes to Purplemash. 2Code (see icon above) offers step by step resources and lesson ideas for teaching coding to young children. Use Beebots to show children how inputting instructions into a device can control it.

Daisy the Dino (see above) is an iPad app which lets you control the on-screen turtle. At the time of writing Scratch Junior is due to be released for iPad.



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Beebots 4



Computer Science – Project Ideas and Software Year 2

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



2DIY 3D Purplemash Resources



ad app: Daisy the Dino



Key Ideas

- What programs and apps do you like using? What do you like about them and how do they differ?
- What kind of people write computer programs? What do we need to control in every day life?
- How do you think that familiar objects work, such as washing machine, microwave?
- What do you think will happen if?
- Why do you think that doesn't work? How could you check the instructions?

Ideas -Example cross curricular computing project
Literacy/Art/Computing/Topic

- Retell your own version of a familiar story using the iPads (Puppet Pals or video camera app)
- Programme a simple animation using Scratch or Scratch Jnr as follows:
- In Scratch import or draw an appropriate background for your story using a range of digital tool
- Add a Sprite to your animation
- Write a simple algorithm or program that makes your sprite move across the screen

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Daisy the Dino (see above) is an iPad app which lets you control the on-screen turtle. At the time of writing Scratch Junior for iPad is due to be released. Scratch is free software installed on school PCs or available online. Simple animations can be programmed using Scratch (explore Scratch projects on the website: <http://scratch.mit.edu>)



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Computer Science – Project Ideas and

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

Key Ideas

- What programs and apps do you like using? What do you like about them and how do they differ?
- How do computers and computer programs help us to control things in our daily lives
- How do you think that familiar objects work? What kind of instructions are we asking them to execute? E.g. washing machine
- What examples can we think of where machines have inputs and outputs?
- Can you predict what will happen in this algorithm?
- Why do you think that doesn't work? How could you debug your code?

Ideas - Example cross curricular computing project

Literacy/Art/Computing/Topic

- Brainstorm the kind of computer games you like to play; what makes them exciting? Why do you like them?
- In art/literacy draw/paint describe/write about a baddy for your game
- In 2DIY 3D create a maze game. Use the digital tools to draw your baddy
- What other aspects of the game can you control? E.g. how long the game lasts/how many lives/sounds
- Find the instructions screen and add instructions for your players
- Send the embed code to a friend so they can play online.

Explaining the Resources

The school has recently purchased a class set of Lego Weedos. These come with resources and lesson plans and are designed to offer children hands-on experiences of creating computer programmes which control robots and machines. The Lego software is installed on computers throughout the school. 2DIY 3D (Purplemash resources) offers opportunities for children to devise their own computer game. There are supporting videos on the website to show you how. Hopscotch is an iPad app which allows you to control onscreen characters.



2DIY 3D Purplemash Resources



2DIY 3D

ICT and Computing Curriculum 2014

Computer Science – Project Ideas and



2DIY 3D Purplemash Resources



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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Weedo



Scratch



Hopscotch



Key Ideas

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Hopscotch



Computer Science – Project Ideas and

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Scratch



Key Ideas

- What programs and apps do you like using? What do you like about them and how do they differ?
- How do computers and computer programs help us to control things in our daily lives
- How do you think that familiar objects work? What kind of instructions are we asking them to execute? E.g. washing machine
- What examples can we think of where machines have inputs and outputs?
- Can you write an algorithm that achieves a specific goal?
- Can you think of different ways to debug your code?
- Can you add forever loops and variables to your programs and explain what they do?

Ideas - Example cross curricular computing project

Literacy/Art/Computing/Topic

- Brainstorm the kind of computer games you like to play; what makes them exciting? Why do you like them?
- In art/literacy draw/paint describe/invent and write about a superhero character. What are his superpowers? Story board and write an adventure story
- Explore the Scratch websites and find some example projects to inspire your own. Plan your computer game, what will happen? How will you win points? What will add challenge to the game?
- Use Scratch to devise a computer game that includes forever loops and variables.
- Create a Scratch accounts and post your game online

Explaining the Resources

Scratch is a programming language and online community, which allows children and adults alike to create computer games, animations and stories. The software is downloaded on the school computers and is also available online at <http://scratch.mit.edu>. Explore the online projects to see how members of the Scratch community have used Scratch to program games animations and digital stories. Encourage the children to explore and click on 'look inside' to examine and re-mix other people's code before embarking on their own projects. Send a letter home encouraging parents to allow their children to create Scratch accounts at home.

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Weedo



Scratch



Computer Science – Project Ideas and

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Hopscotch



Key Ideas

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- What examples can we think of where machines have inputs and outputs?
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- Can you add forever loops and variables to your programs and explain what they do?

Ideas - Example cross curricular computing project

Literacy/Art/Computing/Topic

- Explore the Scratch websites and find some example projects to inspire your own. Plan your computer game, what will happen? How will you win points? Can you add animation to your characters using costumes? Can you use the broadcast function to change the scene or level in your games? Can you use the sensing coding blocks to make something happen? Can you add forever loops and variables?
- Create a Scratch accounts and post your game online
- Use Python to control a turtle on your screen
- Explore HTML (the programming language used internationally to create websites and web pages)

Explaining the Resources

Scratch is a programming language and online community, which allows children and adults alike to create computer games, animations and stories. The software is downloaded on the school computers and is also available online at <http://scratch.mit.edu>. Explore the online projects to see how members of the Scratch community have used Scratch to program games animations and digital stories.

Python is a programming language that historically has only been taught in secondary schools. It is the natural progression from Scratch. Online tutorials and resources can be found at:

<https://wiki.python.org/moin/BeginnersGuide/NonProgrammers>



ICT and Computing Curriculum 2014

Information Technology - Project Ideas and Software - **KS1**

2DIY 3D Purplemesh Resources



Information Technology

Recognise common uses of information technology beyond school
 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



http://www.thinkuknow.co.uk/5_7/LeeandKim/



<http://www.bbc.co.uk/cbbc/topics/stay-safe>

Key Ideas

- Do you think you know how you can stay safe when you are using the computer?
- Do you know who to talk to if you see something that upsets you?
- Did you know that you can use the Internet to communicate and share ideas with people all over the world?
- How can you know whether you can trust the content you find online? (language used/source/URL (school/museum?))
- Can you think of key words that will make your search results more reliable?



<http://www.childline>

See Lesson Plans



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Information Technology Project Ideas and Software **KS2**



<http://www.bbc.co.uk/cbbc/topics/stay-safe>

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

Use technology safely, respectfully and responsibly; know a range of ways to report concerns and inappropriate behaviour



http://www.thinkuknow.co.uk/5_7/LeeandKim/



<http://www.childline.org.uk>

Key Ideas

- Do you know who to talk to if you see something that upsets you?
- Did you know that you can use the Internet to communicate and share ideas with people all over the world?
- How can you know whether you can trust the content you find online? (language used/source/URL (school/museum?))
- Can you think of key words that will make your search results more reliable? Discuss the following:
 - Do the headings look relevant?
 - Does the content seem up to date?
 - Where does the content originate?
 - Is the content easy to read and understand?
 - Does it provide everything they need?
 - Are the links useful?
 - Does it present a one-sided point of view?

See Lesson Plans



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Digital Literacy

Project Ideas and Software Year 1



iPad Camera

Use technology purposefully to create, organise, store, manipulate and retrieve digital content

Recognise common uses of information technology beyond school

2DIY 3D Purplemash Resources



Key Ideas

- What do we use computers for?
- What are the different ways that I can present my ideas on a computer (i.e. photo/film/video/digital story)
- How do we log on and off/what's my class logon?
- Where shall I save my work?
- Begin to understand how drives and folders are organised on a computer

Explaining the Resources

The school has purchased a whole school set of iPads as well as 2 iPads per classroom. The video camera on the iPad is simple to use but children will need to agree to a set of class rules before using iPads eg:

- Always close the cover when a teacher is talking
- Always share the iPad with your partner
- Don't walk around with the iPad without permission

Prior to starting an activity like the one suggested put aside a little time to explain how the video camera works, what makes a good film (hold the iPad steady, point at people's faces etc).

The school has a subscription to Purplemash which is an online resource. A link to Purplemash is available on the school website. You and children will need to be provided with a login to access the resources. Speak to the IT team to get this. 2Create a Story is available as part of the Purplemash suite in Purplemash/Creative tools.

Example cross curricular computing projects

- Use iPads (one between two/three). Chn take turns to think up questions/hot-seat/film one another on class book or topic
- Use 2Create a story (Purplemash resources) to combine words, pictures, sounds and animations. Children could write own versions of a familiar story or showcase some topic learning.

(see Year 2 Projects for more ideas and software)



Digital Literacy

Project Ideas and Software Year 2

I can animate



Book Creator



PuppetPals



Use technology purposefully to create, organise, store, manipulate and retrieve digital content

Recognise common uses of information technology beyond school

Key Ideas

- What do we use computers for?
- What are the different ways that I can present my ideas on a computer (i.e. photo/film/video/digital story)
- How do we log on and off/what's my class logon?
- Where shall I save my work?
- Begin to understand how drives and folders are organised on a computer

Explaining the Resources

The school has purchased a whole school set of iPads as well as 2 iPads per classroom. The camera on the iPad is simple to use but children will need reminding of class rules before using iPads e.g.:

- Always close the cover when a teacher is talking
- Always share the iPad with your partner
- Don't walk around with the iPad without permission

Build on learning in Y1 to explain how the camera works, what makes a good photo (hold the iPad steady, point at people's faces etc.). Puppet Pals is a fantastic app that allows children to use virtual puppets to act out a puppet show. The children can use the puppets in the software or their own from camera roll to create their own stories with voice recordings. Use the different settings in Puppet Pals as a vehicle for discussing story settings. Children can import their own choice of background from camera roll or Internet.

Example cross curricular computing projects

- **Use video camera on iPads (one between two) to rehearse story based on class book or topic. Use Book Creator or I Can Animate to create a simple book or animation using their ideas**
- **Look at some puppet shows on the Internet to give context. In pairs children take pictures of one another using the camera on the iPad. Import photos into Puppet Pals and in pairs use a prepared story-board to plan a joint story. Use the puppetry in Puppet Pals to act the story out, recording sound and moving the digital puppets around the screen.**
- See Y1 for more ideas

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Digital Literacy

Project Ideas and Software Year 3

Keynote



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

Use a range of software (including internet services) on a range of devices including collecting, analysing

Key Ideas

- As their repertoire of different software grows, children should increasingly be encouraged to make their own choices of how to present their information
- Children should have growing awareness and responsibility for saving their own work and navigating their way around the school drives and their online space within Purple Mash.
- Update school blog

Explaining the Resources

Purplemash is an online creative suite of resources, links to the school's portal can be found on the school website. You will need individual pupil logins or a whole class login to access the resources. Contact school IT curriculum support for this. Keynote is available on the school iPad as a lite version of Apple's answer to Powerpoint. Encourage children to use both of these and make comparisons/transfer skills. Children should be encouraged to add text, images, graphics, video, images and sound effects into their presentations making them both informative and visually effective.

Example cross curricular computing projects

- **Research and plan a presentation on topic work. Save relevant images and information from the Internet into a folder. Film some footage of each other pretending to be a reporter. Create a presentation combining all of these elements using Keynote on the iPads or Power Point.**
- **Create a range of letters, leaflets and posters using clip art and your own images using 2Publish Extra in the Purplemash Creative tools.**
- **Use iPad apps such as 'brushes' to paint digital pictures**



Digital Literacy

Project Ideas and Software Year 4



iMovie



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

select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Key Ideas

- What programmes and apps do they like using?
- What similarities or differences do the programmes have?
- Can they present the same information in different ways using a variety of programmes of their choice?
- Can they begin to apply to transfer their skills to make deductions about how software works?
- Children should have increasing awareness and responsibility of how and where to save their own work and navigate their way around the school drives and their online space within Purple Mash.
- Update school blog



Explaining the Resources

iMovie and Pages are available in school on iPads. They are lite versions of the equivalent software on Mac. Windows movie maker and Word are both Microsoft products available on school PCs. Prior to starting their projects the children will need one or two discreet lessons where they familiarise themselves with the features of each software package.

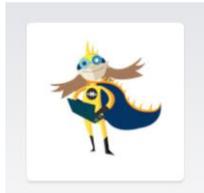
Example cross curricular computing projects

- **Watch a range of movie trailers on the Internet.**
- **Discuss similarities/differences; why are trailers made and what qualities make them engaging? Collaborate in teams to plan a movie trailer based on a book they have read. Plan the backstory together deciding which highlights from the main film to include in the trailer. Help children to structure their team deciding who will be the camera person who will be the actors etc. Film and edit using iMovie on iPads or Moviemaker**
- **Create advertising posters linking with persuasive writing or other theme using Word on PCs or Pages on iPads, include clip art, images from Internet, tables or other graphics. Explore tools. Discuss and compare different software and effects.**



Digital Literacy

Project Idea



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



select, use and combine a variety of software (including internet services) and digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.



WORDPRESS

Key Ideas

- What programmes and apps do they like using?
- What similarities or differences do the programmes have?
- Can they present the same information in different ways using a range of programmes of their choice?
- Can they present the same information in different ways using different apps and programmes?
- Children should have increasing awareness and responsibility of where to save their own work and navigate their way around the internet
- Update school blog

Explaining the Resources

The school website is built using WordPress and at the time of writing each class has a school blog. Children will need careful supervision when updating any content on the website. Work in small groups rather than the whole class at once on this kind of project. Blogger is an alternative tool and online accounts can be easily made using the teachers school email. Pivot offers stick figure animation software on PCs. SketchUp is a 3D drawing used by architects, engineers and Designers all over the world. Watch the help videos within SketchUp for familiarisation with the drawing tools.

Example cross curricular computing projects

- Use websites such as Hackasaurus to show how websites can be manipulated and cons of wikis, collaborating online. Ask the children to find out about and discuss their findings. Look at a range of blogs on the web. Discuss language do they think the blogs are aimed at? Create a class blog or individual posts on the school website or using another tool such as Google Blogger.
- Create a storyline in literacy and use Pivot to create an animation to match
- Use the 3D tools in Sketchup to design a simple 3D house
- Programme the Lego Weedos using Lego computer Software
- Make presentations using online resources such as Prezi using incorporating images from various sources such as Flickr.



Digital Literacy

Project Ideas and Software Year 6

Keynote



iMovie



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



WORDPRESS

select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Key Ideas

- Year 6 is all about choice and independence; Children should be creative in combining software and devices effectively and creatively to present information in an increasingly engaging and effective way. For example children might include videos and digital art that they have created using digital tools into a film or presentation that they have edited using iMovie or Moviemaker.
- They should also have an increasing knowledge and understanding of how the Internet works and be knowledgeable and informed about a range of ways of communicating and sharing online. They should also be aware of and equipped to deal appropriately with online risks (see information technology).

Explaining the Resources

By now hopefully pupils will have had experience with a broad range of software and hardware in school and be able to make reflective choices about which medium to choose for specific purposes. They should be aware of how to export and import different elements from one piece of software to another to create specific effects. For example they could edit photos or create digital art and then export from app/software and import into personation software or film.

Example cross curricular computing projects

- **Make a transition film.** Children could work in teams to decide what they would like to know/who they would like to interview in their secondary schools. Draft questions in Literacy (open questions/journalism unit?). Plan a chat show style programme based on say (Graham Norton!?) Role play/act out school children interviewing members of staff in groups and use iPads to film. Book visit to secondary school and film interviews with staff using iPads/video cameras. Edit finished content using iMovie or Moviemaker. Export and publish on school website.