Comprehensive planning and resources to deliver all aspects of the Primary Computing Curriculum 2014

A practical guide for class teachers by Sally Tippett

Welcome to the Primary Computing Framework

This framework been developed to assist you in delivering an engaging and easy to navigate curriculum across the primary phase. I hope this helps you and your colleagues plan lessons which will engage and inspire your pupils in this exciting area.

For your convenience, all resources referenced in these pages together with an editable version of the entire framework and an Excel assessment booklet are available at www.primarycomputingframework.co.uk.

Please don't hesitate to contact me if you need any further help or guidance. I am available at sally@sallytippett.co.uk

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Computing in Primary Schools

Don’t get overwhelmed by the words!

Overview

- The 2014 national curriculum introduces a new subject, **computing**, which replaces ICT.
- It is covered in two pages.
- It gives you the chance to review and enhance what you are doing now and so provide an even more exciting and rigorous curriculum.

Q. What types of programming are you already doing? How is your school being creative in its use of ICT?

- Whilst the focus of the new programme of study moves towards programming and other aspects of computer science, programming has been part of the primary national curriculum right from the start, as ‘control’ or ‘sequencing instructions’.
- Attainment targets now refer to e-safety teaching giving you the opportunity to plan and deliver regular e-safety lessons.

Purpose of Study

*“A high-quality computing education equips pupils to use **computational thinking** and **creativity** to understand and change the world.”*

Computational Thinking

Computational thinking is a problem-solving process that includes, but is not limited to, the following characteristics:

- Formulating problems in a way that enables us to use a computer and other tools to help solve them
- Logically organising and analysing data
- Representing data through abstractions such as models and simulations
- Automating solutions through algorithmic thinking – a series of ordered steps
- Identifying, analysing and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources
- Generalising and transferring this problem solving process to a wide variety of problems
- Computational thinking does not necessarily require computers

These skills are supported and enhanced by a number of attitudes that are essential dimensions of computational thinking. These include:

Q. When you look at this definition of computational thinking, how much is already taking place in your school?

- Confidence in dealing with complexity
- Persistence in working with difficult problems
- Tolerance for ambiguity
- The ability to deal with open ended problems
- The ability to communicate and work with others to achieve a common goal or solution

Computational thinking combines critical thinking with computing to develop powerful, robust problem solving skills. The computational thinker will be able to:
http://www.iste.org/

Break problems into smaller parts

Put things together, step-by-step

Collect things and find patterns

Make models for experiments

These simple skills will help to form the foundation for computational thinking in a digital age.

Q. Do you recognise these skills in your pupils?

Aims of the Computing Curriculum

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 (Computer Science)
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems (Computer Science)
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems (Information Technology/Creativity)
- are responsible, competent, confident and creative users of information and communication technology. (Digital Literacy/E-safety)

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.

Q. How will you assess the progress made by your pupils?

Q. What will be the purpose of the assessment procedures you choose?

The old system of levels will be abolished and is **not** being replaced. Your school can choose how to assess, record and report on pupil progress. The use of computer notebooks will help pupils to record their work and create their own reference manual to use as they go through the school. This does not need to be marked by the teacher, but used as a record of what the pupils have been doing and a record of progression.

Subject Content

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 CS
- create and debug simple programs CS:C
- use logical reasoning to predict the behaviour of simple programs CS
- use technology purposefully to create, organise, store, manipulate and retrieve digital content C:DL
- recognise common uses of information technology beyond school CS
- 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. DL:ES

CS = Computer Science
C = Creativity
DL = Digital Literacy
ES = E-Safety

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 CS:C
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output CS:C
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs CS
- 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 CS:DL:ES
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content DL:ES
- 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 C:DL:ES
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. DL:ES

CS = Computer Science
C = Creativity
DL = Digital Literacy
ES = E-Safety

Things to remember

- The programme of study is a ***minimum*** entitlement – there's nothing that imposes any limits on what schools, teachers or pupils can cover in computing.
- The programme of study is **not** a scheme of work – it's up to you, as a school, to determine how you cover this content, in what order, in what contexts and with what resources.
- There is a far greater focus now on learning about computers and computation, not simply learning **how** to use technology.
- The opportunity to do something really creative is there for the taking.
- It isn't all about computer science!
- Discrete or embedded?

Q. What do your pupils learn now? Do they learn the how or the why?

Q. How will teach the new curriculum, will you embed the content across all subjects or use discrete computing lessons?

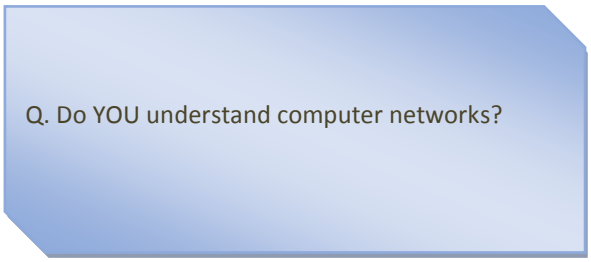
The internet and the world wide web

At Key Stage 2 pupils will:

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

Access to the internet will be needed for many activities, particularly the web. Ofsted's recommendation is not to be too restrictive; they advocate a managed, rather than a 'locked down', approach. Pupils need to learn how to use technology safely, respectfully and responsibly, not to have their responsibility for this taken on by others.

The internet is a big collection of computers and cables.
The web is a big collection of HTML pages on the internet.
The net is the restaurant, and the web is the most popular dish on the menu!



Suggested resources

Early Years and Key Stage 1
Bee Bots
Roamers
Role play toys
Textease Turtle
Roamer World
My World
Digital Cameras (including video)
Paint package
Headphones/microphones
Database package
2DIY from 2Simple
Purple Mash
J2Code

Key Stage 2
On screen turtle such as Textease Turtle or Roamer World
MSW Logo
J2Code
Espresso Coding
Scratch – online (pupils can have their own log ins)
Flowol and FlowGo to connect physical systems
LEGO WeDo will connect to Scratch
Makey Makey
MicroBit
Raspberry Pi
Digital Cameras (including video)
Office programs - flowcharts
Graphics package
Database package
Video editing software
Headphones/microphones

Pupils recording their work

Pupils should be encouraged to keep a 'Computing Notebook/Diary' to record their work and make notes that they can refer back to during their work and in class discussion. It is not intended that this notebook should be marked by teachers, it is for the pupils' personal use only. They may also wish to take this notebook home with them if they wish to practice further at home. The content kept in the notebook will vary according to the age of the pupil, but if used from KS1, will demonstrate a clear progression of understanding. You will find labels to print and use on the front of the books at the end of this Framework.

Useful websites – these websites were active as of October 2016

Onscreen turtle
http://www.transum.org/software/logo/

https://www.turtleacademy.com/

Computing at School
http://www.computingatschool.org.uk/

CS Unplugged – away from the computer
http://csunplugged.com/

UK Hour of Code
https://uk.code.org/

Computer Science for Fun
http://www.cs4fn.org/

Computational Thinking Toolkit for teachers
https://www.iste.org/explore/articledetail?articleid=152

Scratch
http://scratch.mit.edu

Scratch Jnr
http://www.scratchjr.org/

Kodu
http://www.kodugamelab.com/

E-Safety/Digital Literacy support
http://www.swgfl.org.uk/home

J2Code
http://www.j2e.com/j2code/

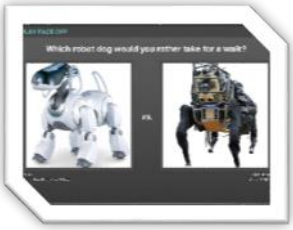
Computing resources from the BBC
Key Stage 1
http://www.bbc.co.uk/education/subjects/zyhbwmn
Key Stage 2
http://www.bbc.co.uk/education/subjects/zyhbwmn

Coding and programming Apps – as of October 16

These apps will support you to deliver the computer science aspect of the curriculum. Many of them are free or low cost.

	Kodable – free for initial levels Very child friendly introduction to programming concepts and problem solving. For children ages 5 and up. Easy to use interface that will appeal to children and as the initial app is free, there is plenty for you and the children to try before you decide to by the full app. Very similar to using a floor turtle and children will have no problem learning what to do.
	Daisy the Dinosaur - free Learn the basics of computer programming with Daisy the Dinosaur! This free, fun app has an easy drag and drop interface that children of all ages can use to animate Daisy to dance across the screen. This is a great visual programming app that children will find easy to learn and use and it will intuitively grasp the basics of objects, sequencing, loops and events by solving this app's challenges.
	Tynker – free for the first level The first level is free and gives you plenty to try out and evaluate with your children. It is another visual programming tool that is easy to use and a great introduction to programming. Some children may need help with reading the instructions.
	Cato's Hike Cato's Hike takes children on a story-based adventure through mazes to collect hearts and stars and find friends. It will help them to understand the logic of computer programming while they guide their character to find keys, unlock doors and rescue damsels in distress.
	BeeBot - free Great app for younger pupils, just like the floor turtle. BeeBot Pyramid also available, which is a paid for app.

	Scratch Jnr - free With ScratchJr, young children (ages 5-7) can program their own interactive stories and games. Still plenty with this app to appeal to older children too.
	Cargo-Bot – free Cargo-Bot is a puzzle game which really tests children's problem solving skills! Suitable for older children as some of the puzzles are quite challenging.
	Hopscotch HD – free for basic levels Building on from Daisy the Dino, Hopscotch is a visual programming tool for older children and is a good app to use as a link between Daisy the Dino and Scratch.
	Lightbot Code Hour – this version free Lightbot One Hour Coding will introduce children to programming. It is suitable for KS2 and uses programming and logic to solve the puzzles. Children will learn concepts like instruction sequencing, procedures and loops by guiding the robot with commands to light up tiles and solve levels.
	Move the Turtle Useful app to teach the basics of computer programming concepts. Some children will need help with reading the instructions and younger children will need adult help to get the most out of the app.



ROBOTS – free

Not an app that teaches programming, but an app that lets children explore all different kinds of robots and even play a game where they can pit one robot against another. Children will learn about the most advanced robots on the planet with 3600 views, interactive images, detailed specifications and hundreds of photos and videos. They can learn how robots work and enjoy exploring how they work.

A.L.E.X. – free

A.L.E.X. is a fun puzzle game. It help children to think and plan logically as they program the robot A.L.E.X. with a sequence of commands to get through each level from start to finish. The lower levels of the games are suitable for children as young as six. Children will love the interface and more able children can even design their own maze for A.L.E.X. to navigate.

Pettsons Inventions Lite – free

Great app for problem solving – computational thinking. Lite version available to try and evaluate before buying full version – Deluxe

How to access the resources used in this Framework.

This Framework is licensed for all teachers in the purchasing school only.

All of the resources referenced in this document can be found on the Primary Computing Framework website. To access these you need to visit http://www.primarycomputingframework.co.uk and login with the details you have been provided. If you experience any problems accessing the website or you do not have the login details, please contact help@primarycomputingframework.co.uk.

You will also have access to additional resources, including other activities, links, lesson suggestions, web resources and worksheets available for download. More resources are being added on a regular basis.

Framework for teaching the Computing Curriculum

Computer Science
Reception to Year 6

E-safety
Reception to Year 6

Creativity
Reception to Year 6

This framework guides you through the 2014 Computing Curriculum. It provides you with a structure to teach from and covers Reception through to Year 6. Each section has built in progression, with ideas for teaching, software suggestions and links to useful websites. The valuable collection of resources, which are only accessible by schools purchasing this framework, can be found at www.primarycomputingframework.co.uk where you can also download an editable version of this document.
In adopting this framework, you can ensure that you are meeting the requirements of the new Computing Curriculum.

Attainment targets Key Stage 1

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.

Pupils should be taught to:	Learning to be Computer Scientists	Learning to be creative	Learning to be e-safe
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			
use technology purposefully to create, organise, store, manipulate and retrieve digital content			
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 or other online technologies.			

Attainment targets Key Stage 2

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.

Pupils should be taught to:	Learning to be Computer Scientists	Learning to be Creative	Learning to be e-safe
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			
use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content			
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			
use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			

Learning to be computer scientists

Teaching and resource guide for Reception to Year 6

Learning to be computer scientists

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.

Attainment targets 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
- recognise common uses of information technology beyond school

Attainment targets 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

Learning to be computer scientists – Reception

Pupils will recognise devices that follow instructions
Pupils will be able to follow instructions given by the teacher
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to sequence a simple set of instructions in the correct order

Example activities	Teacher notes and resource guide
Instructions at home and school Show pupils the PowerPoint presentation **Help I Need Instructions** and discuss with the children the devices they have seen at home and school that need to follow instructions to work. Discuss with them why they need instructions, how the instructions are given and who gives them. What would happen if these were operated in the wrong order, i.e. if we turned the microwave on without putting the food in, turned the TV on to watch CBBCS but didn't change the channel, tried to play with the games console without connecting the handset etc? Ask pupils to collect pictures from magazines to bring into school for a classroom wall display. Pupils can also use a digital camera to take pictures around school to contribute to the wall display. **Follow my leader** Play the game Simon Says with the children - http://www.ehow.com/how_18205_play-simon-says.html Allow time for pupils to follow instructions by giving them simple directions to follow that tell them how you want them to leave the room for play/assembly/lunch etc. **Follow instructions** Set up a simple obstacle course in the school hall and give pupils a set of instructions to move around an obstacle course. Ask pupils if they think it would be harder if they were blind folded and why it would be really important to make sure the instructions were accurate. **Sequencing** Give pupils sets of cards to sequence – numbers/letters/pictures and discuss with them why they put them in that order. **Programming the floor turtle** Set up an obstacle course for the floor turtle or a remote control vehicle and ask pupils to program the turtle to move around the course without bumping into anything. **Extending learning** Pupils who are confident and successful when programming the floor turtle, can also be given opportunity to guide an onscreen turtle around the screen using the built in key pad.	**Algorithm** *An algorithm is a specific set of instructions for carrying out a procedure or solving a problem* Some great activities for Early Years and KS1 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 **Reception resource files:** • Help I need Instructions PowerPoint **Suggested software and resources** Floor turtle – BeeBot, Roamer for example Remote control toys On screen turtle Digital camera Collection of magazines/store catalogues **Sequence card sets to download and print:** http://www.dltk-kids.com/type/sequencing.htm **Sequence cards online** http://www.enchantedlearning.com/sequencingcards/

Learning to be computer scientists – Year One

Pupils will be able to give directional instructions that can be understood and followed
Pupils will be introduced to the word algorithm
Pupils will understand the need for accuracy when giving instructions
Pupils will share and discuss their knowledge of directional instructions with their peers
Pupils will begin to create and debug simple programs using directional language

Example activities	Teacher notes and resource guide
Following instructions – a recap: Watch and discuss **'What Could Go Wrong'**- http://www.bbc.co.uk/education/clips/zb43cdm Use this video to introduce the word algorithm and discuss what it means with the pupils. Explain that when they are learning to be computer scientists, they will be creating a lot of algorithms and testing them to make sure they work. **Making the perfect Salad Sandwich** Discuss with pupils the best way to make a salad sandwich. Show the PowerPoint **Salad Sandwich** and purposely rearrange the instructions in the wrong order and discuss with pupils what would happen if they were followed that way i.e. put both pieces of bread together and then the salad on top. Now discuss with the class the best way to put the ingredients together to ensure you have a lovely sandwich! What else would they add, and when? What would the instructions for their perfect sandwich look like? **Following directional instructions** During PE give pupils verbal instructions to navigate around an obstacle course, using the language, forward, backward, left, and right. Put pupils into pairs and ask them to give each other verbal instructions **Writing instructions for others to follow** Give pupils a prepared maze with a start and finish and ask them to write/discuss the instructions to get a counter from one side to the other using directional language. Pupils swap instructions and test. Once pupils are familiar with directional language, begin to use floor robots or similar. Pupils should first write and then test the program to move it around an obstacle course. **The need for accuracy** Discuss the need for accuracy when giving instructions or writing algorithms: What happened to the floor turtle when inaccurate instructions were given? What did you have to do?	**Algorithm** An algorithm is a specific set of instructions for carrying out a procedure or solving a problem Some great activities for KS1 and KS2 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 http://www.bbc.co.uk/guides/zqrq7ty **Debug** Identify and remove errors http://www.bbc.co.uk/guides/ztkx6sg **This unit will introduce pupils to directional language:** Forward Backward Left Right **Year 1 resource files:** • Salad Sandwich PowerPoint • Instructions are out there PowerPoint • Design a robot worksheet **Suggested software and resources**

When something is programmed incorrectly we say that the program has a bug – a mistake, flaw or error in the code. Show pupils the PowerPoint/presentation **Instructions are out there** and discuss what the functions of each are. All these devices rely on accurate programming, so what do pupils think would happen if the programs that ran these devices had a bug? **I can program** Discuss with pupils the interface they will be using depending on the software you have, and ensure that they understand what each of the commands do: How do I move the turtle, forward, backward, left and right? What happens if I use the Pen Down/Up command? How do I return the Turtle to its Home position? How can I move the Turtle to a new position? How can I clear the screen? In order for pupils to explore the on screen Turtle environment, set them different challenges: Can you make turtle go the top of the page? Can you make turtle go to the bottom of the page? Can you make the turtle return to its 'home' position? Can you make turtle draw a square/2 squares/3squares? Can the squares be different colours? What did they find hard/easy? Did they have any bugs in their program and if so, how did they spot it and what did they do to correct it? What would they change next time? **Read together:** Babette Cole, 'The Trouble with Dad' – this story is a good example of what can go wrong when you try to build robots! Pupils could produce their own work about a robot that went wrong using the **Design a robot worksheet**	Bee Bot Roamer Programmable toys On screen turtle J2Code logo level 1 http://www.j2e.com/logo.html **Useful links for mazes** http://www.mrprintables.com/free-printable-mazes.html http://krazydad.com/mazes/ **The Trouble with Dad** Lovely story about robots, you can still get this on Amazon, it may be second hand, when I looked it was 1p plus P&P The book is also available in iTunes for £2.99

Learning to be computer scientists – Year Two

Pupils will understand what algorithms are
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to create and debug simple programs
Pupils will be able to predict the behaviour of simple programs and explain their reasoning

Example Activities	Teacher notes and resource guide
Re-cap In Y1 pupils used the full directional language and should be familiar with the words Forward, Backward, Right, Left. Revisit this with pupils if necessary and discuss again what an algorithm does. **Introducing shortened form of instructions** Using the PowerPoint, **Making it Simple** show the shortened forms of instructions, Fd, Rt, Bk, Lt, ask them what they think these instructions mean and why we might use them instead of the longer versions. Next show the set of instructions on the next slide for a square and ask pupils to predict the outcome and explain their reasoning: **Predict and test** • What would happen if one of the numbers were changed? • What would happen if one of the instructions were missing? • Is the last command of rt 90 important? Discuss these scenarios with pupils and ask them to predict what they think would happen. Give time for pupils to test their predictions with an onscreen turtle. (If the numbers were changed to 50, the square would be larger, if an instruction was missing it wouldn't draw a square, the last command puts the turtle back into a starting position, but does not affect the finished square) Give pupils time to use an on screen turtle to test the instructions, were their predictions correct? **Write and discuss** Once pupils are familiar in the use of shortened forms and are using the onscreen turtle with confidence, ask them to record in their notebooks an algorithm for a: Rectangle Two squares	**Algorithm** *An algorithm is a specific set of instructions for carrying out a procedure or solving a problem* Some great activities for KS1 and KS2 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 http://www.bbc.co.uk/guides/zqrq7ty **Year 2 resource files:** • Making it Simple PowerPoint **Suggested software and resources** On screen turtle J2Code logo level 3 http://www.j2e.com/logo.html You can see an example of turtle letter challenges at http://www.transum.org/software/logo/

Three squares A shape of their choice Discuss what pupils have written as a class before testing. Record any debugging notes in their notebooks. **Turtle letters - LTF** Challenge pupils to write the instructions so that an onscreen turtle will draw the letter L, then try again for T and again for F. Discuss. These instructions should be recorded in their notebooks, so that they can test, debug and re-write if necessary. **Introduction to Scratch (Move block)** This activity is designed to familiarise pupils to the Scratch interface and to a different type of programming language. There is no expectation that pupils will be able to use and understand all the aspects of this program. Show pupils how to make the cat move across the stage using a blue MOVE block. Drag a MOVE block into the Script area and click on it. Ask the pupils: What happens to the cat? How far does he move? How do you think we could make him move further? How do you think we could make him move backward? Watch the Green Flag above the stage area, what happens to it when I click on the MOVE block? (It flashes) Click on the flag and show that nothing happens to the cat. Click on the Events scripts and ask pupils to look for the Green Flag – drag the flag onto the stage and link above the MOVE block. Ask what they think will happen when you click on the flag now.	

Learning to be computer scientists – Year Three

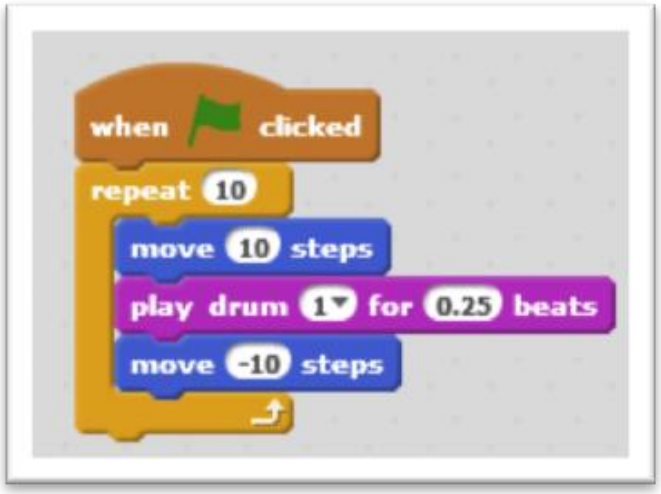
Pupils will explain how simple algorithms work and will start to spot some errors
Pupils will be able to write and debug simple programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will understand the need for accuracy when giving or following instructions

Example Activities	Teacher notes and resource guide
Re-cap Discuss the word algorithm with pupils and ask them to give examples of how algorithms might be used around the home, school, shops etc. **Introducing Repeat** Show them the PowerPoint **Repeats** -with the algorithm that will instruct an on screen turtle to draw a square. Study the algorithm together and discuss the angle of turn and the number of sides. Discuss with pupils that there is easier way to write this algorithm as a little program that will instruct the turtle what to do, but in order for it to work it needs to be accurate. Look at the next slide of the PowerPoint: Repeat 4 [fd 40 rt90] Discuss the way in which this program has been written. (Notice that square brackets have been used and the algorithm finishes with an **end** instruction, so that the turtle knows that the **repeat** command is over. A square has **4** sides and each angle is **90^0**) Predict - What would happen if the Repeat was 5 instead of 4? Would this still draw a square? (Yes, because the last repeat of fd 50 would draw over the first line, so it will still look like a square) **Write, test and debug – tinkering** *Pupils will try the following challenges, tinkering to see if they can get it right. They may struggle trying to work out the correct angle of turn, this is fine as calculating the angles will be covered in the next activity.* Can pupils write the repeat procedures for a: Pentagon or a hexagon? They should then test their program for accuracy.	**Algorithm** *An algorithm is a specific set of instructions for carrying out a procedure or solving a problem* Some great activities for KS1 and KS2 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 http://www.bbc.co.uk/guides/zqrq7ty **End** is a basic logo command and signifies the end of the repeat which may not run without it. The **Repeat** command means fewer commands have to be given to carry out the same procedure. **Year 3 resource file:** • Repeats PowerPoint **Suggested software and resources** Onscreen turtle Turtle Academy - http://turtleacademy.com/lessons/en MSW Logo J2Code logo - http://www.j2e.com/logo.html

Allow time for pupils to experiment with other repeat procedures. The more that pupils can explore this environment, the better they will begin to understand it. **Going further:** What problems did pupils encounter? Did they struggle with calculating angles? Did any pupils spot the following pattern? Discuss and work through the slide Looking for patterns with pupils: Square has Repeat 4 Pentagon has Repeat 5 Hexagon has Repeat 6 Ask pupils if this program will work and why? Repeat 4 Fd 50 Rt 360/4 End *When programming the Turtle to draw shapes, 360 divided by the correct number of sides of the shape can also be used:* *360/4 = square* *360/5 = pentagon* *360/8 = hexagon* *And so on…..* *The external angles of any regular polyon total 360^0.* **Write, test and debug – tinkering** *Pupils can try the challenges again, tinkering to see if they can get it right.* Can pupils write the repeat procedures for a: Pentagon or a hexagon? They should then test their program for accuracy. Allow time for pupils to experiment with other repeat procedures. The more that pupils can explore this environment, the better they will begin to understand it. **Introduction to Scratch (Repeat)** This activity is designed to familiarise pupils to the Scratch interface and to a different type of programming language. There is no expectation that pupils will be able to use and understand all the aspects of this program. In Y2 pupils explored the MOVE block and the Event flag. Drag out a MOVE block and re-cap with pupils how this can make the	**Exterior angles of a polygon** Useful website to use: http://www.mathsisfun.com/geometry/exterior-angles-polygons.html

cat move across the stage. Click on the Control scripts and ask pupils to look for a REPEAT block. Drag the block onto the script area and show pupils how this can wrap around the MOVE block. What do pupils think this REPEAT block does? Ask them what needs to be added to make the cat move when you click on the green flag. How many steps will the cat move when we click on the green flag. How could we change the total number of steps? You could link here to times tables being learned.
Set the following script up and ask puipls to predict what will happen when you click the green flag.

Give pupils opportunity to explore this script for themselves and change the different variables to find out what happens. Ask puipls to share what they have discovered and how they changed their script.



Learning to be computer scientists – Year Four

Pupils will explain how algorithms work and will be able to detect errors
Pupils will be able to write and debug programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will be able to write a procedure that instructs the turtle to draw a flower
Pupils will apply their knowledge of the importance of accuracy when giving instructions

Example Activities	Teacher notes and resource guide

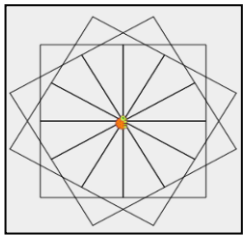
Re-cap
Discuss algorithms and what they are. Have a discussion about the use of algorithms in and around school and how they have used them previously in their work.
Discuss why you might use a **Repeat** procedure when writing a program for the turtle. Ask pupils to write down what the Repeat procedure for a square would be and then to share with the class. If necessary, allow pupils to test their program on the computer.
 	
Naming, writing and running a procedure – teaching Turtle a new word
Pupils will write a new **procedure** and call it 'square', they will test the new procedure to check that it works. Extend this activity by instructing pupils to write procedures for different polygons.
If you have no available software in school, a useful site that will help with this activity is **Turtle Academy** - http://turtleacademy.com/lessons/en
`Hi`
`Welcome to the Turtle world>`
`> to square`
`... repeat 4 [fd 100 rt 90]`
`... end`
 	
Using a repeating procedure to draw a flower - 1
Discuss with pupils that a procedure can be repeated any number of times by using the 'repeat' command. What would happen if they repeated their procedure called 'square' 12 times? Demonstrate this on the board using an onscreen turtle package – the turtle will draw a square 12 times, but each square will be on top of the other so you will not be able to see each different
	Algorithm
	An algorithm is a specific set of instructions for carrying out a procedure or solving a problem
	Some great activities for KS1 and KS2 can be found on the BBC website:
	http://www.bbc.co.uk/guides/z3whpv4
	http://www.bbc.co.uk/guides/zqrq7ty
	
	Procedures
	By writing a procedure, pupils can name, edit and run a specific procedure. For example, to teach the turtle to draw a square:
	to square
	repeat 4 [fd 100 rt 90]
	end
	
	Once you have described your procedure to the program, you can enter its name on the command line just as you would for any commands.
	In this case, you would say on the command line,

square.
Ask them what they think needs to happen to the square in order for turtle to draw it 12 times, but in a different place, so that it looks like a flower.

Using a repeating procedure to draw a flower - 2
Pupils have already written a procedure called 'square' and tested it, now they need to write another procedure called 'flower', which will use the 'square' procedure. Discuss with pupils this new procedure.

The turtle will:
- draw one square
- turn 30° to the right
- draw another square
- this will be repeated 12 times, so creating a flower.

```
Repeat 12
[Square Rt 30]
End
```



Ask pupils to write, run and test the procedure called 'flower' and discuss with them the results. Did it work? Can they explain what has happened?

For further help have a look at the **Turtle Academy-** http://turtleacademy.com/lessons/en online lessons.
J2Code also have supporting lessons to use for this activity - http://www.j2e.com/j2code/ - see the lessons for year3/4

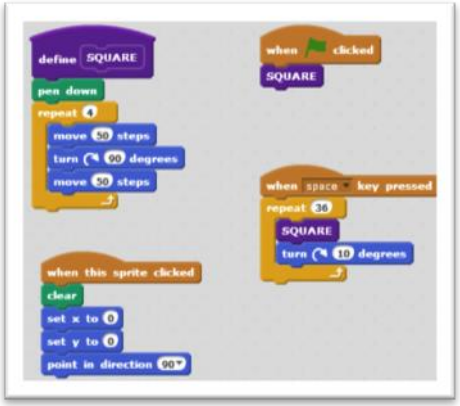
Give pupils opportunity to experiment with different procedures they have written themselves. This can be a difficult concept to grasp and needs lots of reinforcement, practice and play!

Introduction to Scratch (Repeating Procedure)
This activity is designed to familiarise pupils to the Scratch interface and to a different type of programming language. There is no expectation that pupils will be able to use and understand all the aspects of this program.
Pupils will use Scratch to write a repeating procedure and experience how a different type of programming language can be used to draw a flower as they did in the earlier activity.
Give pupils a copy of the **Scratch Square Procedure hand-out** to work through and explore. If you are using Computer Notebooks, pupils can record their findings and the script they have used and tested.

Teacher notes are also provided for this activity and teachers can also look at the provided project to see how the script has been put together.

square
and the program looks up your commands for doing a square. The turtle will draw a square.

Introduction to Scratch (Repeating Procedure)
Teachers, you will find a copy of this script here
http://scratch.mit.edu/projects/16144857/



Year 4 resource files:
- Scratch Square Procedure hand-out and teacher notes

Suggested software and resources
Turtle Academy
http://turtleacademy.com/lessons/en
J2Code
http://www.j2e.com/j2code/

Learning to be computer scientists – Year Five

Pupils will be able to write programs that control or simulate physical systems
Pupils will begin to solve problems by decomposing them into smaller parts
Pupils will apply their knowledge of the importance of accuracy when giving instructions
Pupils will understand how input/output devices work

Example Activities	Teacher notes and resource guide
Introduction Ask pupils if they can identify devices at home, school and in the environment that need instructions to operate. **PowerPoint Devices in the environment.** Think about: • a lift • GPS navigation system • computer keyboard • door code • theatre lights • fire alarm • pedestrian crossing Explore with pupils the following: Do they need one or more instructions to accomplish a specific goal? Does it matter which order the instructions are carried out in? What would happen if one of the instructions failed to operate? What other devices can pupils think about that would be affected by incorrect instructions or errors? **Practical activity for sequencing – recap on algorithms** Pupils should be able to sequence a set of instructions in the correct order, i.e. how to open a program on the computer or tablet. Pupils write their own set of instructions and work with a partner to carry them out and check that they are in the correct order. This activity does not need to be done on a computer, pupils can write and share their instructions in their computer notebooks – the instructions can be for any type of activity, for example: • Picking up a pencil and drawing a square • Moving from one chair to another • How to draw a stick man	**Algorithm** *An algorithm is a specific set of instructions for carrying out a procedure or solving a problem* Some great activities for KS1 and KS2 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 http://www.bbc.co.uk/guides/zqrq7ty **Flowcharts** A flow chart is a graphical or symbolic representation of a process. Each step in the process is represented by a different symbol and contains a short description of the process step. The flow chart symbols are linked together with arrows showing the process flow direction. **Year 5 resource files:** • Devices in the environment PowerPoint • Flowchart examples PowerPoint **Suggested software and resources** Flowol 4 Word or any text editor that has flow chart symbols

- How to button a coat

Discuss what happens if the instructions are followed in the wrong order.

What is a flowchart?

Display the symbols used in a flowchart and discuss their meaning then display and discuss the two simple flowcharts Lamp doesn't work and Check the bath on the **Flowchart examples PowerPoint**. What are the processes this flowchart is going through?

What is different about the second one which checks to see if a bath is full?

Now watch the video from the **BBC website on System Flowcharts** and then discuss and recap on how flowcharts are used and created.

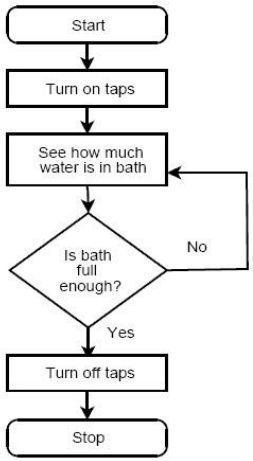
http://www.bbc.co.uk/schools/gcsebitesize/ict/measurecontrol/ - this is an interactive activity you can all do together

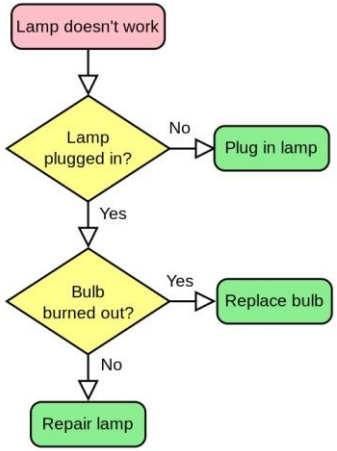
Ask pupils to put together a flowchart for making a cup of coffee or use the Flowchart activity here:

http://www.education.rec.ri.cmu.edu/robots/4H/roboticsandyouonline/index.html

Select **Robotics Explorer**, then use Lesson 7

Software such as Flowol or the ones mentioned opposite will allow pupils to use mimics to replicate real-life situations. This will give a greater emphasis on input and output and help to reinforce the concepts. If no software is available, reinforcement can be done through paper based activities.





RobotProg is a simple flowchart program free to download - http://www.physicsbox.com/demorobotprogen.html

WizBang is also free and you may find this useful too - http://wizbang.sourceforge.net/WizBang/WizBang.html

Always check with your schools technician before download any programs.

Useful website for flowcharts

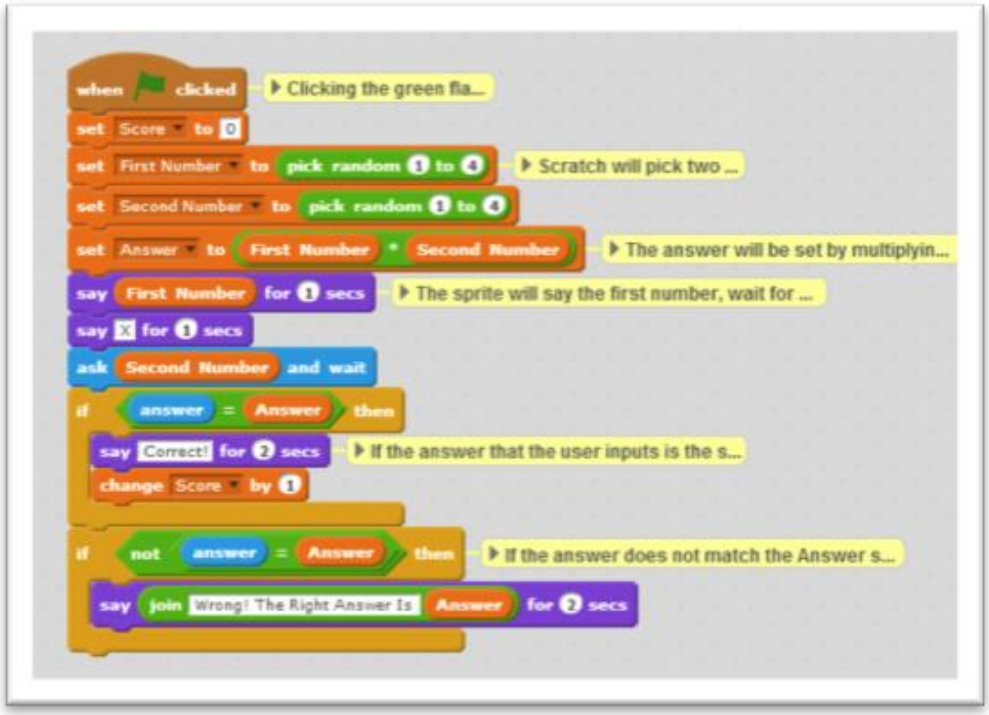
This website – gives two good examples of flowcharts that teachers can use as reference.

http://www.multiwingspan.co.uk/scratch.php - click on **Flowcharts** in the menu on the right hand side.

Introduction to Scratch (Flowchart investigation)

In this activity, pupils do not need to understand all of the programming language used, but to be able to investigate the script used to explain what is happening. Open the **Scratch project Times Tables flowchart** example - https://scratch.mit.edu/projects/16144269// and ask the pupils to look at the script used. Can they explain what is happening? In this script, the actions on stage will depend on the decisions and choices made by the user, this is determined by the script used. Investigate the script with the pupils – the script has hints alongside each line which can be expanded when needed to give more information.

Which variables could be changed in this script that would alter the actions on stage?



Learning to be computer scientists – Year Six

Pupils will be able to write and debug programs that accomplish specific goals
Pupils will be able to solve problems by decomposing them into smaller parts
Pupils will be able to use logical reasoning to explain how simple algorithms work and to detect and correct errors
Pupils will apply their knowledge of the importance of accuracy when giving instructions

Example Activities	Teacher notes and resource guide
During Year 6, pupils should be given opportunity to revisit **Scratch** and then to use, explore and create. They can safely create their own account on the Scratch website, so that they can share projects and work on them between home and school. They will already be familiar with the Scratch environment from earlier work and this is an opportunity to build on that familiarity and take their understanding further. There are lots of helpful videos for you and pupils on the Scratch website - http://scratch.mit.edu/help/videos/ **Introduction to Computational Media** Discuss with pupils: • What are the different ways they interact with computers? • How many of those ways involve them actually **creating** with computers? Explain that over the next several sessions they will be creating their own interactive computational media with Scratch. Show them the **Scratch Comic, Bit and Byte go Fishing** - http://scratched.gse.harvard.edu/sites/default/files/bit_and_byte_go_fishing_with_scratch.pdf either on the IWB or printed copies and discuss what the characters are talking about. They don't need to understand all the commands at this stage, but do need to understand that computers need special instructions to make them work. **Building the basic blocks** Show a basic demo of Scratch, choose a method that suits you: • Scratch introduction PowerPoint file in download area • a live demo from within the Scratch interface • through one of the Scratch overview videos (lots of introductory videos available on the Scratch website) • use the helpful guide built into the Scratch interface, you will find this on the right hand side of the screen.	**Algorithm** *An algorithm is a specific set of instructions for carrying out a procedure or solving a problem* Some great activities for KS1 and KS2 can be found on the BBC website: http://www.bbc.co.uk/guides/z3whpv4 http://www.bbc.co.uk/guides/zqrq7ty In Year 6 pupils will be applying what they have learned in previous years to object orientated programming. Object orientated programming allows data and procedures to be packaged together using elements called objects, which are single units. **Scratch online** http://scratch.mit.edu/ **Scratch resource files for teachers** https://scratch.mit.edu/help/ **Year 6 resource files:** Scratch introduction PowerPoint

Scratch uses building blocks – what have pupils played with physically that is a little like that? (Lego)
In Scratch, you build projects by snapping blocks together, just the same as with Lego.
It is useful to have some Lego in school and have pupils build something and then explain how it was put together or create a flowchart or instruction sheet to tell someone else how to build it.

Using Scratch to make a cat dance
The key features/blocks that need to be covered in the initial stages are:

- Move blocks
- Sound blocks
- Repeat blocks
- Say blocks
- Event blocks
- Looks blocks

Mastering and understanding these blocks is important as they will form the foundation of everything else they do. Work through with pupils, exploring and discussing together as you go. It is important that there is plenty of discussion around what each of the blocks is doing and why, before moving on to the next step.

Exploring further
Give pupils 10 minutes to explore the Scratch interface in an open-ended way. The **Scratch Cards** which can be downloaded from the Scratch website are really useful to have available here. Working in pairs, ask them to make something surprising happen to a sprite. Allow opportunities and time for some of these to be shared and discussed with the class.

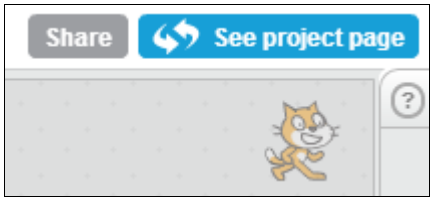
Designing and creating their own mini project
Pupils now begin to build upon their initial explorations of the Scratch environment by creating an interactive project, **All About Me**. Show them the project on Scratch – **All About Me Project** - http://scratch.mit.edu/projects/2041660/

This is an example of how theirs could look. Click on the See Inside button

and explore the programming together and discuss how it was put together. Pupils can now either remix

this project, or create their very own.
Pupils should share their "About me" projects and ask others in the class to ask questions, such as:
How did you do that?
What did you get stuck on? How did you solve that problem?
What are you most proud of? Why?

Scratch Step by Step Intro
If you can't see this guide, click on the question mark icon when in the Scratch create environment.



Scratch Creative Curriculum
This website has a complete curriculum which you can download to help you teach Scratch and is useful if you decide to run a Scratch club.
http://scratched.gse.harvard.edu/guide/download.html

Showcase
To complete their work on Scratch, give pupils a project to work through and complete which will give them the opportunity to consolidate their skills and demonstrate understanding.
Pupils can use an existing project and remix if this helps them.

What might you want to do next? If pupils have a Scratch account they can post their projects on the Scratch website if they wish to. **Remixing an existing project** To explore Scratch even further, pupils will remix the **Maze Starter -** http://scratch.mit.edu/projects/10128431 Click on See inside to examine the programming used. Discuss the different blocks used and what operation they are performing. When you are sure that pupils understand these blocks, they can then click on Remix to edit it and make it their own. Again, projects can be shared with the class and put in the pupils own area on Scratch should they wish too. Please be aware that although some of the Starter Projects on the Scratch website look simple, they can contain quite detailed programming, so it is advisable to direct pupils to specific projects that you know they will understand in the first instance. Pupils will now have a good grasp of the Scratch environment and can continue to work on remixing projects, or creating their own. **Extension activity suggestion** If pupils have grasped Scratch and are using it well, they can design their own game to share with others and the media that may go alongside it: • Game Box Design • Instruction Leaflet • A game/company logo	

Learning to be Creators

Teaching and resource guide for Reception to Year 6

Learning to be creators

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.

Attainment targets key stage 1

Pupils should be taught to:

- create and debug simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content

Attainment targets 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
- 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

Learning to be Creators - Reception

Pupils will know how to log on and off from a computer
Pupils will be able to use a mouse or tracking device to navigate around a computer screen
Pupils will know how to print work
Pupils will be able to enter text on screen
Pupils will know the difference between a digital image and a moving image (digital camera/video camera)
Pupils will explore the role of ICT in the world around them

Example activities	Teacher notes and resource guide
What are computers for? Discuss with pupils what they might use a computer for: Do they have a computer at home? Do they have a tablet at home? What do they use these for? Talk about the computers that the pupils in your class will have access to, where they are, when they can use them and the activities they might use them for. **Usernames and passwords for logging on and off** Show them from the IWB how they should log on to the computer and discuss why they need to use a username and password and how this might be different from how they use technology at home. **Assessing mouse skills** Give opportunity for pupils to access simple software on the computer so that you can assess their level of mouse/control skills. If they are used to using a computer at home, their skills may already be very good, or if they are used to using a Tablet PC at home, they may well only be used to navigating through touch control. **Learn how to print.** Using a simple paint package, pupils paint a picture of themselves, mum, dad, their dog etc. and label it. Show pupils how they can print this picture so that it can be displayed on the classroom wall.	For Reception age children it is acceptable to have very simple usernames and passwords. The key teaching point here, is that pupils begin to understand the need for usernames and passwords and get used to using them. The ICT during Reception is varied and flexible. Children should be experiencing a range of equipment, their ICT experiences will not be based solely on the computer. **Reception resource file:** • Emotions PowerPoint **Suggested software and resources** Programmable toys Remote control cars and toys Toys with on/off switches Role play toys Music keyboard Microphone Tape recorders

Exploring digital images Talk and explore with pupils what emotions are, how we look when we are sad, happy, cross etc. You can use the **Emotions PowerPoint** to help with this and there is also a lovely free app on the App Store that teaches pupils to recognise emotions, search for **Touch and Learn Emotions App.** Show pupils a digital camera (this may be a tablet computer) and talk to them about how you can use this to take a picture. Take pictures of some of the children showing the different emotions, "let's all look happy"; "let's all look cross" etc. Display these images on the IWB and talk about them. Allow pupils opportunity to take pictures themselves, if you have a class of tablet computers they can work in pairs to do this, alternatively allow for the children to take pictures throughout the day/week. Display a collection of images on the IWB and discuss them with the pupils. **Exploring moving images** Using a nursery rhyme or song that the children are familiar with, use a digital video camera/tablet computer, to record their performance. Display this on the IWB and play back to children (you will need sound!) Discuss with the children how this is different from taking still pictures. Ask questions such as: Why is a video different from a picture? Which do you like to look at most? What else can you find out from a video that you can't from a picture? Where else do you see digital videos?	CD Players Simple Paint Package Touch and Learn Emotions iPad app

Learning to be Creators - Year One

Pupils will be able to use a computer to create and develop digital art work
Pupils will be able to use a digital camera to record selected images
Pupils will be able to use images they have taken within in other software packages
Pupils will be able to use a digital video camera to record a class activity
Pupils will be able to use ICT to represent information graphically and begin to interpret that data accurately

Example activities	Teacher notes and resource guide
Digital Artists in the Real World Discuss with pupils where in the real world they may see digital art: ▪ **Animator**: creates animations for cartoons, films, the internet and more. They must be able to draw and make the images appear to move using animation software. ▪ **Game designer**: designs video games. This can involve all aspects of creating a game, from writing the script, to creating the characters, to writing the programs. ▪ **Graphic artist or graphic designer**: They are a key part of all advertising and they help to show visually what a company does or makes. They help design logos, posters, brochures, book covers, product labels, packaging and websites. Show and discuss the images in the PowerPoint **Digital Art in the Real World** which contains examples of pictures created using ICT. You could add to these images if you wish. Discuss how these images might have been created and why these are sometimes more appealing than standard photographs. Collect magazines and brochures to look for where digital art has been used. Discuss some of the features of the pictures and discuss how they are different from pictures produced using traditional methods. **Creating digital images** Linking into work already being done in other curriculum areas pupils use a graphics package to design and draw a digital representation of something they can see in the real world. Give time for discussion and feedback on the images they are working on and encourage them to create different versions until they are happy with their work. Examples: Flowers	**Creating digital images** Pupils need to understand that their work can easily be amended and that ideas can be tried out without spoiling earlier versions. Encourage pupils to save their work with different version numbers, so that they can always go back to an earlier design if they choose to. **What is digital art?** http://www.tate.org.uk/learn/online-resources/glossary/d/digital-art *Digital Art can be defined as any art that is made with the help of a computer.* **Capturing digital images** Pupils may need help downloading the images to the computer and it is acceptable for the teacher to do this for them. They should however, be able to locate and load the image into the software. **Year 1 resource files:** • Digital Art in the Real World PowerPoint • Travelling Around PowerPoint • Travelling Around tally chart worksheet

Trees
School logo
Book cover
Comic or magazine cover image and text

Capturing digital images
Pupils use a digital camera to take an image/s of some work they have produced as a record of that work, for example during a science experiment or PE lesson. They **download** this picture/s to the computer and then **import** into a text document. Ask pupils to use the text document to record what the picture is about and what it represents. They should be encouraged to **Save** their work regularly and understand the implications if they do not do this.
A free and easy to use photo editor is www.aviary.com – this will work on a computer and a tablet.

Capturing digital video
To introduce the pupils to digital video and experience the difference between the mediums of still and moving images, pupils should be allowed to use the video camera to record a class activity, assembly, PE lesson etc. This can be done at any time during the term with opportunities allowed for presentations of the films they have taken and discussions about what could be improved and why. There is no uploading or editing needed for this activity.

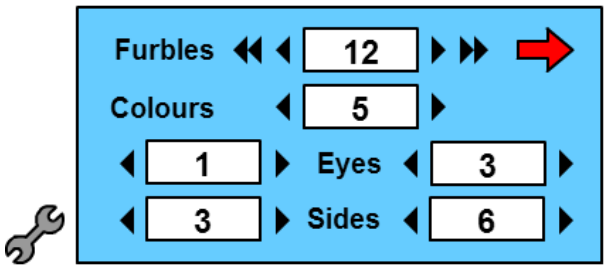
Represent information graphically – gathering information
Use the PowerPoint **Travelling Around** to display pictures showing different modes of transport. Discuss with the class how they normally come to school. Use this as a starting point for discussion and then use the worksheet **Travelling around tally chart** to give time for pupils to collect the information and complete the table.
Ask questions such as:
How many are travelling by car?
What is the **least** common way of travelling?
What is the **most** common way of travelling?

Collecting data
Using the information collected in the tally chart, demonstrate to the class how this data can be entered into a graphing package to produce a pictogram. Once the pictogram is complete ask questions about the data that it represents and show how the pictogram will change if the data changes.

Suggested software and resources
Graphics/Paint Package
Database package
Online Pictogram packages – see below

Online Pictograms
Topmarks - http://www.topmarks.co.uk/
Search for Pictograms to find lots of useful activities

Using Pictogram Graphs:
http://gwydir.demon.co.uk/jo/numbers/pictogram/info.htm



Set the properties through this box or define specific criteria using the spanner tool.

Constructing a pictogram Show the online graphing and sorting tool **Furbles** http://www.ptolemy.co.uk/furbles03 and as a class, group the shapes according to the number of sides, eyes, colour etc. Spend time working together with pupils to explore the different pictograms that can be generated. Set different criteria for pupils to explore using Furbles and let them create their own pictograms.	

Learning to be Creators - Year Two

Pupils will learn that technology can be used to communicate ideas
Pupils will recognise common uses of information technology beyond school
Pupils will recognise that some forms of communication are better than others
Pupils will be able to create, store and retrieve digital content
Pupils will be able to use a branching database to integrate data

Example Activities	Teacher notes and resource guide
Different ways to communicate Discuss with pupils the way in which technology can be used to communicate ideas and thoughts: TV News/Radio Emails Text Messages Telephone Calls EBooks and magazines Can they think of any others – some might talk here about social media like Facebook and Twitter, if so, use this as an opportunity to discuss e-safety implications and the age restrictions on such social media (13). How do they think people communicated before technology? Was this type of communication as instant? What are the advantages and disadvantages of the different ways of communicating today? Which do they prefer and which would they use most often? Show pupils the PowerPoint **Sharing Information PowerPoint** and discuss the pictures with them. Make sure they understand what is being represented in each picture and how the information is being communicated using that medium, what sort of information does it usually contain. How do these different ways of communicating differ, are some better than others, if so why? Choose an age relevant topic linked to current theme you are teaching, or topics from the **Newsround** website http://www.bbc.co.uk/newsround/ and show and discuss these with the class. Pupils should choose one of these events and discuss in pairs how they could communicate the information represented to someone else. Pupils choose one form of communication and then use a text editor or desktop publishing package to present and explain their choice. Encourage pupils to save different version numbers of their work so that they can also go back to the original if they	**Year 2 resource files:** • Sharing Information PowerPoint • 20 Question Cards • CSUnplugged Twenty Guesses guide and activity can be found at http://csunplugged.org/information-theory/ **Suggested software and resources** Text editor such as Word Branching database package Digital camera Digital video camera Digital video editing software such as Movie Maker **Communication through a lens – digital video** Pupils need to know how to use a digital video camera and how to upload and edit clips. Some pupils may require more assistance than others with this. The key aspect of this activity is that pupils

need to. They may choose to do a news headline and sub-title, a text message, an email, a magazine cover etc. The work they produce will be a representation of that communication, so if they choose a text message for instance, they will type the text message into a Word document and then explain why they chose this medium. Share pupil work with the class and discuss how effective the chosen form of communication would be, would the message be understood? **Communication through a lens – digital video** Demonstrate to pupils how to record using a digital video camera and then how to upload the clips to the computer. Show pupils how to import the clips into a video editing package so that they can be edited. During this time discuss with pupils that once the clip is uploaded, you can add titles, music and publish the movie so that it can be shared with others. Working in small groups or pairs, pupils should then be given the opportunity to use a digital video camera to record a class activity, such as a science experiment or art activity, limit the filming to just 30 seconds. Either on their own, or with adult help, the clip should be uploaded to the computer. Pupils need to locate and import the clip into a video editing package and then: • Add a title at the beginning • Add some background music • Add a title at the end • Publish their movie Note: there is no need for pupils to be able to edit the clips at this age (trimming, splitting, deleting etc) Make time for pupils to show their completed films or upload them to the school website so that they can be shared with the wider community. Vimeo also offers a video sharing service – www.vimeo.com **Questions and answers** Pupils need to develop their awareness of different types of questions, how they can be asked and how technology can be used to answer them. They should explore how yes/no questions can be used to divide a set of objects into sub-sets and they can be used to identify an object. Think of an object and invite the pupils to ask you questions that can only be answered using yes/no answers. How many questions will they ask before guessing what you are thinking of? Pupils can play this game in pairs to practice further. Give out the **20 Questions cards** to pairs of pupils, in pairs, one pupil holds up their card with the word facing outward so that they do not see it. They ask the other pupils yes/no questions to try and guess the word written on their card. There are more activities to explore in the **CSUnplugged Twenty Guesses Teacher Guide** Explore a branching database to find an object as a class, look at the whole tree view and discuss how each question splits the branches in two. Demonstrate to the class how to use a branching database to create a tree diagram of branching questions. Ask them to plan their questions, trying to split the remaining objects into about half each time, for example: • Shapes	understand that digital video can be a form of communication and that events can be recorded and shared with others. Teachers should not worry if the pupils recording and editing skills are not perfect. **Questions and answers** Question pupils about their choice of questions and how effective they are. They need to be able to organise information in a branching database using efficient questioning and need to be encouraged to refine our questioning when necessary. **Resources to support lessons on simple databases can be found here** http://www.primaryresources.co.uk/ict/ict2.htm http://www.primaryresources.co.uk/ict/powerpoint/branching_data_intro.ppt 20 Questions iPad app is also a useful resource

• Mini Beasts • Kings and Queens When they have built their tree, they should test the tree with friends to see if it works correctly. Throughout these activities discuss with pupils the types of questions being asked and how effective they are at gathering information. Would different types of questions be better? How could they improve their tree? Did their tree work?	

Learning to be Creators - Year Three

Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will collect and present data accurately
Pupils will be able to use search technologies effectively to locate appropriate resources needed for their work
Pupils will understand the principles of animation

Example Activities	Teacher notes and resource guide
When text and graphics come together During this work pupils will be exploring how text and graphics work together. Have a collection of magazines, cards, newspapers etc. and explore with pupils different forms of media that use text and graphics effectively: Magazines and Newspapers Reading books Greetings Cards Websites Look at the balance between text and graphics and the layout of the information on the page/card etc. Why does some media have more text than pictures? What information is being portrayed? What is the purpose of the media you are looking at? Think about the topic you are presently covering, or the time of the year (season), with this in mind, pupils should plan on paper a design for a greeting card, postcard, poster, magazine cover, newspaper article, arranging text and image boxes appropriate to the medium. Pupils do not have to do all of these, choose the one that most suits the theme being covered and the ability of the pupil. It is important that this is planned on paper and discussed before being produced at the computer. Useful online resources you can use for this topic include: Aviary Photo https://aviary.com/ Big Huge Labs https://bighugelabs.com/ **Sounds Alive** Introducing to pupils the many different ways that we listen to sounds today and comparing them. Discuss the different ways in which we can listen to sound today: TV Radio CDs	**Year 3 resource files:** • Dinosaur Poem without sound effects • Dinosaur Poem with sound effects • Dinosaur Poem sheet • Help Sheet for Audacity • Patterns in Nature PowerPoint • Mini beast data cards **Suggested software and resources** Word Processing software such as Word Desktop Publishing package Graphic Paint package Sound recording and editor tool such as Audacity – http://audacity.sourceforge.net/ free to download Database package Animation package Collection of store catalogues A set of telephone directories/Yellow Pages **Sounds Alive**

MP3 players Computers What are the differences between these methods? Which do pupils use/prefer? Why? Play the **Dinosaur Poem without sound effects** to the pupils, ask for feedback, would anything make listening to this poem better? Then play the **Dinosaur Poem with sound effects** and ask the pupils to say which they preferred listening to and why. Pupils will then begin to record their own poem. You can use the same one - **Dinosaur Poem sheet -** or pupils could write their own or you could use one applicable to your topic or time of the year. Using a recording program such as Audacity, pupils will record their poem. They need to understand that the poem should be recorded in sections to make editing easier, see **Help Sheet for Audacity** if you need help on using Audacity in the classroom. Once they are happy with their recording, they should then research sound effects that can go with it and save this to an appropriate area to bring into their recorded poem to align to the corresponding voice recording. **What is data?** Ask pupils what they think data is and collect their responses on the whiteboard Discuss the definitions they have suggested and where around school or home they might find data sets, such as: Telephone directories Store catalogue such as Argos Dictionaries Reward charts at home Some questions to ask: What kind of information do these data sets give us? How easy are they to use? Which have you used? Set pupils the challenge of finding the name, address and telephone number of a local plumber to carry out emergency repairs in school. Split the class into two groups – one group should use a traditional telephone directory the other group use an internet database such as **Yell** – www.yell.com Each group should record the information they gather to report back to the class. Discuss with pupils which method was easier, quicker, gave more information etc. When we are dealing with large sets of data, finding the information we need manually can take a lot of time. A database can be a much quicker way of locating information. Give children the opportunity to collect and present their own data around a given topic – this could be linked to work being done in other subjects or to a seasonal activity: Wives of Henry VIII Rivers of the world Population around the world Gifts given on the 12 days of Christmas	You can download and save sound effects files from: Find Sounds: http://www.findsounds.com/ NEN Gallery – http://gallery.nen.gov.uk/gallery1274-.html If you register for the NEN gallery, you can embed the galleries of images and sounds onto your own website or learning platform, really useful! **What is data?** Data is a collection of facts, such as values or measurements. It can be numbers, words, measurements, observations or even just descriptions of things. http://www.mathsisfun.com/data/data.html **Note -** Data handling is one of the central activities in which real mathematicians engage: they are frequently analysing data that they have gathered in various contexts and looking for patterns and generalities within them. In schools we often undertake tasks in which we encourage children to collect data about themselves and their friends but the emphasis tends to be on presenting data in a variety of forms such as bar charts or pictograms. Analysis is often confined to identifying the most popular or least

Mini Beasts – mini beast data cards are provided in the resource pack **Patterns in nature** Discuss where you might find patterns in nature. Show the PowerPoint **Patterns in Nature** and discuss the images and the patterns that pupils can see. Discuss with pupils where they might see or have seen patterns in the world around them. Use digital cameras to go in and around school looking for repeating patterns and taking photographs. Pupils should then look at the images they have taken and choose 2 from their selection. They should upload these images to the computer and study them closely. Ask them to import the image into a text document and explain what they can see. Ask them how they could use the computer to create a repeating pattern, which program would they choose to do this? They may not automatically choose a painting program, some may say they could use a text editor or other software. Allow them to use their chosen program to create a repeating pattern design. Save these images for discussion and further development. Things you could do with the final images: Print and display their images Import the images into a text editor to write a report Teacher collects the images and makes a slideshow Showcase them on your school website Make a magazine or scrapbook of images **STOP! Motion 2D** Investigating what animation is Discuss with pupils what animation is, can they give examples they have seen, such as films or TV programs. Show them some examples of animations from You Tube or film trailers. What do they think the difference is between 2D and 3D animation? Creating a flipbook animation. Watch this BBC clip and discuss how to make a flipbook http://www.bbc.co.uk/programmes/p009lb0q. Discuss the term *frame* that Pat uses in the video. What do pupils think it means? How many frames does it take an animator to make one second of animation? (25) Ask pupils to think of an idea they would like to animate – keeping ideas simple. Pupils need to plan and draft what their animation will be about before building the flipbook. They should then build their own flipbook working toward 25 frames (pages). Share the flipbooks with the class and discuss. The teacher can film the flipbook in action so that the animation can be played on the whiteboard. Remember that the main objective of this lesson is that pupils understand what an animation is and how it can be put together. You can follow this work up using **Pivot Stick Animator** - http://pivotanimator.net/ which is free animation software to download or an animation app on your tablet computers.	popular item. These limitations tend to restrict the interest and variety of the contexts that are explored, and fail to engage children in any significant mathematical thinking. **NRICH** - http://nrich.maths.org/5449 **Patterns in nature** are visible regularities of form found in the natural world. These patterns recur in different contexts and can sometimes be modelled mathematically. Natural patterns include symmetries, trees, spirals, meanders, waves, foams, arrays, crates and stripes. Wikipedia **Animation** There are three main types of animation: **traditional**, **stop motion**, and **computer generated**. Each can be used to make either 2D or 3D images. http://www.wisegeek.org/what-is-animation.htm

Learning to be Creators - Year Four

Pupils will use and combine a variety of software to design and create digital and printed presentations
Pupils will recognise and use good features of digital presentation
Pupils will collect and analyse and present data accurately
Pupils will be able to make simple edits to a film

Example Activities	Teacher notes and resource guide
It's all in the presentation Questions to ask pupils: What is a presentation? Have you ever seen one? What do you think makes a good/bad presentation? Show the two PowerPoint presentations **– How to Make a Cupcake pp1** and **How to Make a Cupcake pp2** and discuss the differences between the two and what makes one better than the other. Show the class the leaflet, **How to Make Cupcakes** and discuss the layout and presentation with them. Pupils research the internet to collect information about presentations. They need to collect enough material to produce a document entitled *Presentation Skills* - Dos *and Don'ts*. This document should contain 10 tips for creating a good presentation. It can contain text and images, the layout should be decided by the pupil. Choose some pupils to present their tips with the rest of the class and discuss. Allow pupils time to amend their document if they wish to after discussion time. They will be referring back to this in later work so it must be saved accordingly. Alternatively, it might be easier for some pupils to re-design the cupcake leaflet and make it more readable. They can use the original leaflet and amend that, or get the information from the original source - http://www.wikihow.com/Make-Quick-Easy-Cupcakes (Remember that this document is a presentation in itself as is the sharing with the rest of the class and should be following the rules they have learned!) **Using data effectively** Explore with the class data in the real world: Football/rugby league tables Weather charts Population numbers etc. • How does this data help us to answer questions? • What can we use it for?	**Year 4 resource files:** • PowerPoint How to Make a Cupcake 1 and 2 • How to make cupcakes leaflet **Suggested software and resources** Text editor such as Word Desk Top Publishing program Presentation software Data handling software and tools **Presentations** Useful links for teachers **What makes a good presentation?** http://www.slideshare.net/importerss/what-is-a-presentation **Note**: Places like Hobby Craft have lots of 'how to' leaflets around their stores, these would be useful to collect to discuss how they are presented.

• Is it easy to access? • How often is it updated? Explore with pupils how data can be displayed graphically, if you have no software available, you can still access the **ITP Data Handling** http://www.taw.org.uk/lic/itp/itps/datahandling_2_9.swf to demonstrate different types of graphs. Discuss with pupils how they are different and which they find easier to use to gather information. Conduct a survey in class on favourite bands and let pupils use this data to create their own graph on the ITP or your own software. You could extend this activity to conduct a survey of the whole school. Explore with pupils how using ICT to generate graphical representation of data simplifies the process and allows for the data to be changed instantly. **Multimedia Presentation Project** This activity is based on the previous lessons about effective presentations and data collection. Using what they have learned, pupils research weather data for their own location and for the three other locations around the world. This is a useful website to use http://www.worldweathercompare.co.uk/ They should collect and present this data and any other relevant information about the localities they are researching, in a way that will effectively communicate the information to the chosen audience. They can choose which method of presentation they prefer to use, i.e. PowerPoint, Slide Show, Document, Information leaflet etc. Presentation and evaluation of the finished project is important and pupils should be allowed time to change and amend in light of feedback. **Simple video editing** Pupils have already used digital video and learned how to upload clips to an editing program. They should now explore how the films they have taken can be edited and refined, removing mistakes, unnecessary sections etc. in order to refine their finished movie. Set a project for pupils to film. Pupils should plan and storyboard their film before beginning. Encourage a collection of short video clips of about 20 seconds rather than a long film, this will help in the editing process and will make re-filming any sections easier to handle. Topics could include: News report on local issues Virtual tour of the school Information film about places of history or places they have been studying Mini drama based on a well-known story	**Prezzi** Prezzi is a good alternative to office tools for creating interactive presentations – educational licences apply or you can sign up for free http://prezi.com/prezi-for-education/ **ITPs** Note that some of the original ITPs are still available and archived. At the time of writing these were available on this archived website http://www.taw.org.uk/lic/itp/ **Data Handling Online resources** http://www.topmarks.co.uk/maths-games/7-11-years/data-handling **Note** If you have a service such as Espresso in your school, you may wish to save a selection of video clips based on a specific topic for pupils to 'stitch' together and edit into a finished project with titles, music etc.

Learning to be Creators - Year Five

Pupils will recognise that technology can be used to alter and manipulate images
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will explore and create 3D animation
Pupils will recognise the benefits of using a spreadsheet to manipulate data

Example Activities	Teacher notes and resource guide
Digital Image Manipulation – can we believe what we see? Discuss with the class the **Believing is Seeing PowerPoint** and explore the different images and how they have been manipulated: What were they? How have they been altered? What do they represent now? How do you think these have been created? **Wish you were here** Pupils choose a photograph of a holiday destination, remote location or somewhere they would like to go, but have never been. They save this photograph and also take and save a photograph of themselves, try to keep this photo relatively simple. Pupils will then use photo editing software to combine the two images to make it look as though they are really visiting their chosen place. This will need practice, allow pupils to create a few different versions before they choose their final one. They should be making judgements on how to improve the image, discussing with peers on what and how they could improve their images. It may be that they decide that the original photograph of themselves is not suitable and that they need to retake. If you have no software available, this online tool will be useful https://pixlr.com/editor/ - pupils will need to practice working in layers. **Stop! Motion 3D** In year 3 pupils explored 2D animations and what animation means, now pupils will explore 3D animations. Recap with pupils about what they know about animation and what animations they have seen on the television or at the cinema. Discuss with them the three types of animation: • Traditional • Stop Motion • Computer Generated	**Famous paintings updated with technology** A Google image search on this phrase will bring some wonderful examples to share with pupils. **Year 5 resource files:** • Believing is Seeing PowerPoint • Spot the Difference PowerPoint • Shopping list spreadsheet **Suggested software and resources** Pixlr online photo editing Photo editing software, ie Colour Magic **Online photo editing software** http://pixlr.com/ **Note** If you do not have software that will achieve this, then pupils can take an existing image and manipulate it with filters, drawing etc.

Open the PowerPoint **Spot the Difference PowerPoint** and from the first slide, ask pupils if they can classify each of the films into which type of animation it is. Collect the results and then go through the rest of the presentation and discuss the correct answers with them. Which did they get right/wrong – why did they think they were wrong on some of them? How difficult/easy was it to tell them apart?
Pupils should plan their own animation project, will they use 3D or 2D? What will their animation be about? Use a storyboard for pupils to script and plan their animation before they begin. Pupils could use:
Lego
Toy figures
Modelling clay
Paper cut outs
 	
How useful is a spreadsheet? – Undertake this work if it is not already being covered through Math lessons
Before showing pupils a spreadsheet, ask them what they already know about them:
What are they?
What are they used for?
Why might we use a spreadsheet instead of calculating on paper?
Where might they be used?
Once you have ascertained their level of understanding, open a spreadsheet and discuss how it is made up.
A sample shopping list spreadsheet is provided in the teacher resources, questions to ask:
• What is the total of each shop?
• What would be the total cost if all prices went:
  ○ Up by 10%
  ○ Down by 10%
• What is the average price of the items in each shopping list?
• From the Supermarket 2 shopping list, how much does each Follow-On Milk 2 6+ cost?
 	
There are lesson plans and teacher support files available on two very useful websites that you can easily adopt and use:
http://www.primaryresources.co.uk/ict/ict2.htm
 	
http://www.simonhaughton.co.uk/theme-park-spreadsheets/
	Animation
	There are three main types of animation: **traditional**, **stop motion**, and **computer generated**. Each can be used to make both 2D or 3D images.
	http://www.wisegeek.org/what-is-animation.htm

Learning to be Creators – Year Six

Pupils will use and combine a variety of software to design and create a digital presentation for a given audience
Pupils will collect and analyse and present data accurately within a spreadsheet
Pupils will understand computer networks including the internet and the services they provide (world wide web)
Pupils will recognise how these services offer opportunities for communication and collaboration
Pupils will use search engines effectively in research

Example Activities	Teacher notes and resource guide
Inside the Internet Ask pupils to think about the following questions and discuss: How big is the internet and is it part of the real world? Who uses the internet and why? What can you do on the internet? What does WWW stand for? How do you connect to the internet? You may wish to watch the video from the **IT Crowd, The Internet** on You Tube https://www.youtube.com/watch?v=iDbyYGrswtg and discuss how the characters fooled Jen. Following discussions, ask pupils to draw the internet and share these drawings with the class. Use these drawings to identify and correct any misunderstandings or misconceptions. There is a collection of drawings on the PowerPoint **Picture the Internet** that can also be shared with pupils. ***NB - Teachers please note that the IT Crowd is classified as age 12+, the content of this clip has been checked and there is nothing age inappropriate in the clip. However, you may wish to watch the whole clip before using and decide on it's suitability for yourself or get parental permission before using.*** **Searching and searching** What is a search engine and what is it used for? **BBC Webwise -** http://www.bbc.co.uk/webwise/0/22562913 Pupils use search engines almost every day, but they should understand how to use them effectively. Explore different ways of searching for information and analyse the different search results. They should be encouraged to use key words and evaluate digital content carefully for appropriateness. Common Sense Media have produced a series of lesson plans that you can use with pupils to cover this area - https://www.commonsensemedia.org/educators/lesson/strategic-searching-6-8 - **Strategic Searching**	Although the World Wide Web is often referred to as the Internet, the two are not the same thing. The Internet is a huge network of networks that links computers together all over the world using a range of wires and wireless technologies. The World Wide Web is the collection of linked pages that are accessed using the Internet and a web browser. **Year 6 resource files:** • The Internet (The IT Crowd) video is available on You Tube https://www.youtube.com/watch?v=iDbyYGrswtg • Picture the Internet PowerPoint **Suggested software and resources** Access to the internet Suitable search engine Presentation software or resources

What is the internet? Ask pupils to research the question 'What is the internet?' and to collect 10 facts which would help explain the internet to someone who didn't know. These facts will be used to create a presentation. Use the Computer Science Unplugged activity Routing and Deadlock with pupils to explore further. http://csunplugged.org/routing-and-deadlock Discuss further how information is accessed on the internet, i.e. Web pages Email Voice messages Files transfers Video recordings etc. Watch together the Commoncraft video **World Wide Web in Plain English** - http://www.commoncraft.com/video/world-wide-web this will help to consolidate pupil understanding. Pupils may find the Internet Map an interesting visual. http://internet-map.net/ List together ways in which we communicate via the internet today **Explain and present** Pupils will now have explored many concepts and information about the internet and the world wide web. They can use this information to create a multimedia presentation that is designed to be used with younger pupils to explain the differences between the internet and the world wide web. They should be given opportunity to plan, prepare and present their presentation using their chosen medium. This could be PowerPoint, Video, SMA, hand book etc. **Spreadsheet Modelling – Undertake this work if it is not already being covered through Math lessons** Pupils learn to use a spreadsheet to explore a mathematical model. They will be taught to use formulae in spreadsheets to answer 'what if ...?' questions. They will explore how changes in a spreadsheet affect results and identify simple rules. Pupils will apply what they have learnt in this unit when exploring mathematical and scientific models. This work could build on work done in Year 5 – ask pupils to bring in a shopping list from home, or the teacher could provide one, which they should then transfer to Excel to investigate the prices further. Resources and lesson plans are available from these two websites: http://www.primaryresources.co.uk/ict/ict2.htm http://www.simonhaughton.co.uk/theme-park-spreadsheets/	**What is the internet?** Useful links for teachers: BBC Webwise – How the web works http://www.bbc.co.uk/webwise/guides/what-is-the-internet **Visualising the internet** http://news.bbc.co.uk/1/hi/technology/8552415.stm **Inside Google** http://www.google.co.uk/about/datacenters/gallery

Learning to be e-safe

Teaching and resource guide for Reception to Year 6

Learning to be e-safe

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.

Attainment targets key stage 1

Pupils should be taught to:

- 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.

Attainment targets key stage 2

Pupils should be taught to:

- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Many of the suggested activities and resources for this section will link to **Common Sense Media** with suggestions for other relevant websites to use and activities to try. **South West Grid for Learning** also use these materials in their Digital Literacy Curriculum where you can find other activities and curriculum ideas should you wish to explore other areas.

We have taken a selection of these resources and referenced those which will help you to cover the Programme of Study for Key Stage 1 and 2.

Whole school e-safety

If you have not already done so, your school will benefit from registering and completing the **360º online self-review tool** - http://www.360safe.org.uk/

The 360 degree safe self-review tool is free to use and is intended to help schools review their e-safety policy and practice. It provides:

- Information and stimulus that can influence the production or review of e-safety policies and develop good practice.
- A process for identifying strengths and weaknesses.
- Opportunities for commitment and involvement from the whole school.
- A continuum for schools to discuss how they might move from a basic level provision for e-safety to practice that is aspirational and innovative.

To complement the 360ºsafe tool, BOOST is a new enhanced e-safety package of apps, tools, services & resources specially designed for schools that want to be better than good, and is also provided by South West Grid for Learning.

If you would like to find out more about how these services can benefit your school, contact them at support@swgfl.org.uk

Learning to be e-safe - Reception

Pupils will learn how to login to the school computers safely
Pupils will learn that staying safe online is similar to staying safe in the real world
Pupils will learn the school rules for staying safe on the internet
Pupils will understand the importance of asking for help from an adult when on the internet or using computers
Pupils will learn how they can use the internet to find information

Example activities - Laying the foundations for e-safety teaching	Teacher notes and resource guide
Learning how to login in Pupils will need to learn how to use a username and password for logging in to the computers at school. At such a young age it is acceptable that these are very simple and easy to use. It is important that pupils begin to use these to log on in preparation for work on password security in Year 1. Set a simple login for pupils such as: Username = a Password = 1 Explain to pupils that everyone needs to have their own log ins, just as they have their own shoes or coats and that we wouldn't normally share these with other people, because they are just for us to use. **Our school rules** Talk to pupils about the school rules for using the computers. The school AUP (Acceptable Use Policy) may be too difficult for younger pupils to understand, amend if necessary so that it contains simple sentences and instructions that they can understand, for instance: • I will ask my teacher before I use the computer • I will only use the activities that my teacher has told me I can use. • I will take care of the computer and other equipment • I will ask for help from my teacher if I am not sure what to do or if I think I have done something wrong. • I will tell my teacher or an adult in school, if I see something that upsets me on the screen. • I know that if I break the rules I might not be allowed to use a computer. **Staying safe** Pupils must learn that they can go to exciting places online, but they need to follow certain rules to remain safe. By taking a virtual field trip, pupils can experience the power of the Internet to take them to places they might not be able to visit in	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf **Smartie the Penguin Lesson Plan** http://www.childnet.com/resources/smartie-the-penguin

person. They learn that they should follow safety rules when they travel online, just as when traveling in the real world. Resources and lesson plans can be found at: **Common Sense Media – Going Places Safely** https://www.commonsensemedia.org/educators/scope-and-sequence **Asking for help** **Using Smartie the Penguin resources and lesson plan** Explain to the children that they are going to be thinking about the internet and start by asking them some simple show-of-hand questions: Who likes to use the computer? Who uses a computer at home? Who likes to play games on the computer? Who has been on the internet before? Who likes to play games on the internet? Who has an Xbox / Wii / Nintendo DS (or 3DS, DSi etc.) / PSP / PlayStation? What are their favourite websites and why do they like them? This lesson and the activities explore why Smartie should ask for help at home when using his computer. Talk with children about who they can go to for help when in school. **Is a computer just for games?** Pupils learn that computers are not just for playing games on and that they can be used to search for useful information. In this section pupils search for pictures online by clicking on letters of the alphabet. They learn that directory sites with alphabetical listings offer one way to find things on the Internet. **Common Sense Media – ABC Searching** https://www.commonsensemedia.org/educators/scope-and-sequence **Keeping it Private** This work introduces pupils to what information about themselves should be kept private. They will review what information is private and should not be shared without a trusted adult's permission. They view an online form that asks for private information and understand that they should never share this kind of information online. Pupils then view sites that ask them to create usernames, and they learn rules for safeguarding their private information when they create usernames. This will help them to learn more about the importance of using their own login details when using a computer. **Common Sense Media – Keeping it Private** https://www.commonsensemedia.org/educators/scope-and-sequence	**Note**: There is a broken link in the ABC Searching activity for a picture dictionary, this website offers an alternative: http://photographicdictionary.com/

Learning to be e-safe - Year One

Pupils will learn that they may leave a digital footprint when using the internet
Pupils will learn ways for staying safe when using the internet
Pupils will learn that they can use the computers to discover new ideas and visit new places
Pupils will learn how people can use the internet to bully others and where they can go for help

Example activities	Teacher notes and resource guide
Staying safe online Pupils will learn that they should stay safe online by only choosing websites that are suitable for them to visit and that they should avoid sites that are not aimed at them or appropriate for them. **Common Sense Media – Staying Safe Online** https://www.commonsensemedia.org/educators/scope-and-sequence **Learning about digital footprints** Pupils follow the digital information trails of two fictional animals. They make observations about the size and content of each trail, and connect these observations by thinking critically about what kinds of information they want to leave behind. **Common Sense Media – Follow the Digital Trail** https://www.commonsensemedia.org/educators/scope-and-sequence Another useful website to use with children, or for children to share with adults at home is **Kidsmart – Digital Footprints** http://www.kidsmart.org.uk/digitalfootprints/ **What is a cyberbully?** Pupils learn that children sometimes can act like bullies when they are online. They explore what cyberbullying means and what they can do when they encounter it and who they can go to for help. **Common Sense Media – Screen out the Mean** https://www.commonsensemedia.org/educators/scope-and-sequence Another useful resource to use here is **DigiDuck's Big Decision** – this can be read online or schools can order free copies, it is also available as an e-book for iPads. http://www.childnet.com/resources/digiducks-big-decision	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf

Find the best websites Pupils will learn that not all websites are suitable for them and that some are better than others. They will learn to identify their research goals and choose the best keywords to achieve those goals. Then they apply their knowledge by using their keywords in a search. Students examine their search results and observe how a good choice of keywords can get them the information that they want and is suitable for their needs. **Common Sense Media – Using Keywords** https://www.commonsensemedia.org/educators/scope-and-sequence	

Learning to be e-safe - Year Two

Pupils will learn why passwords are important and the reasons for keeping them private
Pupils will learn that computers can be used to communicate with people close and far away
Pupils will learn that they must use technology safely and respectfully

Example Activities	Teacher notes and resource guide
Are we logging on correctly? Pupils should now be using their own passwords and usernames to log in to the computers in school. They should understand that this information is personal to them and should be shared with anyone else. Each pupil in your class should have their own login details, you may wish to keep a copy of these somewhere safe. Pupils do forget their login details frequently, but they should be encouraged to learn and remember them. Watch *How secure is your password?* http://www.bbc.co.uk/newsround/24837924 and then follow on with the Powerful Passwords work which will help you to build on their previous knowledge, help them to learn password tips, test their existing passwords with an interactive game, and create new passwords using guidelines for powerful passwords. **Common Sense Media – Powerful Passwords** https://www.commonsensemedia.org/educators/scope-and-sequence **Test and compare passwords** This is a useful website for pupils to test passwords. Do not let them use their current passwords, but have a discussion about what might make a good password and test its reliability with this site. http://howsecureismypassword.net/ **Show Respect Online** To introduce this topic, you can still access the resources and teacher packs from **Safer Internet Day 2013 Connect with Respect.** http://www.saferinternet.org.uk/safer-internet-day/sid-2013/schools-packs In this work pupils will explore the similarities and differences between in person and online communications. They will learn how to write clear and respectful messages and to show respect in social situations. They will be able to recognise the importance of tone in both face to face and online communications and learn the rules for writing clear and respectful messages. **Common Sense Media – Show Respect Online** https://www.commonsensemedia.org/educators/scope-and-sequence	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf

My Online Community Pupils will explore the concept that people can connect with one another through the internet. They will understand how the ability for people to communicate online can unite a community. **Common Sense Media – My Online Community** https://www.commonsensemedia.org/educators/scope-and-sequence	

Learning to be e-safe - Year Three

Pupils will learn how they can protect themselves online and discuss the information they share with others
Pupils will learn where they can go for help and support when they have concerns
Pupils will learn that they must use technology safely and respectfully

Example Activities	Teacher notes and resource guide
Being a good digital citizen Pupils will explore what it means to take on responsibilities in both their offline and online communities as a way to learn how to be good digital citizens. Teachers, you can download **a set of flash cards** to use with your pupils if you wish, during this work. These will help you to explain some of the key features to them and the types of questions you can ask - https://www.fosi.org/good-digital-parenting/digital-citizenship-flashcards-digital-citizenship/ **Common Sense Media – Rings of Responsibility** https://www.commonsensemedia.org/educators/scope-and-sequence **Keeping information private** Pupils will think about the information that they could share online if they weren't careful. They will learn about identity theft and the implications. Watch the video **Caught in the Web** - http://www.bbc.co.uk/newsround/13908828 and discuss with pupils the things that happen to Lonely Princess and what she does about them. Do they think that something like this could happen to them? Make a list on the board of the things that Lonely Princess does wrong and what she SHOULD have done to protect herself. **Common Sense Media – Private and Personal** https://www.commonsensemedia.org/educators/scope-and-sequence **Who can you talk to?** Discuss with pupils what they can do if they feel worried about something they have seen online http://www.thinkuknow.co.uk/8_10/report/ **Sticks and Stones** This is an introduction to cyberbullying. Pupils will explore in more detail in Year 5. Pupils will think how it feels to receive hurtful messages and how their own actions could upset others. They will consider that they may encounter online messages from children that can make them feel angry, hurt, sad, or fearful. They explore ways to handle cyberbullying and how to respond to upsetting language online.	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Advice and tips for staying safe online – useful questions to explore with pupils: http://www.bbc.co.uk/newsround/13910067 Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf

Kidscape has a good range of resources that can be used in the classroom - https://www.kidscape.org.uk/what-we-do/resources/ **Common Sense Media – The Power of Words** https://www.commonsensemedia.org/educators/scope-and-sequence At the end of this work, watch together Club Penguin's Simon Pollard who gives his top five online safety tips - http://www.bbc.co.uk/newsround/13906802	

Learning to be e-safe - Year Four

Pupils will learn the importance of using and keeping safe their passwords
Pupils will understand the term plagiarism
Pupils will know what spam is and how to deal with it
Pupils will be able to demonstrate the importance of keeping personal information private

Example Activities	Teacher notes and resource guide
How safe is your password? Pupils will explore how a secure password can help them to protect their private information? They will learn how to create secure passwords in order to protect their private information and accounts online. Teachers, the pupils in your class should always use a unique login for the computers in schools and understand that this should not be shared with anyone else. **Common Sense Media – Strong Passwords** https://www.commonsensemedia.org/educators/scope-and-sequence **Spam, spam, spam** Pupils will compare junk mail to spam, learn tips for handling spam safely, and then use those tips to answer questions on the **Is It True? Student Handout** about a boy who receives spam. Pupils will then finish by making their own songs about how to deal with spam, using tips from the **Is It True? Student Handout**. Pupils will have already learned and used Audacity in Year 3, so this will be an excellent way for them to put their skills into practice. **Common Sense Media – You've Won a Prize!** https://www.commonsensemedia.org/educators/scope-and-sequence **Whose is it?** Watch this **video about plagiarism** and discuss what happens and what plagiarism means – https://www.youtube.com/watch?v=hdOYE-FLNuo During this unit, pupils will learn that although the Internet makes it very easy, copying the work of others and presenting it as one's own is called plagiarism. They also learn about circumstances in which it is permissible to use the work of others. **Common Sense Media – Whose is it, anyway?** https://www.commonsensemedia.org/educators/scope-and-sequence	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **What is Spam?** Read this article for more information http://www.childnet.com/sorted/spamphishing.aspx

Who can you talk to? Discuss with pupils what they can do if they feel worried about something they have seen online http://www.thinkuknow.co.uk/8_10/report/	**Suggested software and resources** Advice and tips for staying safe online – useful questions to explore with pupils: http://www.bbc.co.uk/newsround/13910067 Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf

Learning to be e-safe -Year Five

Pupils will be learn that they must keep their personal information private when online
Pupils learn how to identify secure sites that they can use safely
Pupils compare cyberbullying and in-person bullying and learn strategies for coping with it
Pupils discuss and identify where to go for help and support when they need it

Example Activities	Teacher notes and resource guide
Talking safely online Watch the **Jigsaw Assembly** video from CEOP with pupils - https://www.youtube.com/user/ceop This is a powerful video and teachers are advised to watch it prior to teaching so that they can decide if any pupils in their class would be worried by it and be prepared for questions. Pupils learn that, while people can develop rewarding friendships online, they should be cautious with online-only friends and never reveal private information without asking a parent or trusted adult for permission. They will discuss the difference between online and in-person friendships, explore an online chat scenario, and complete and sign a checklist for safe online chatting. **Common Sense Media – Talking Safely Online** https://www.commonsensemedia.org/educators/scope-and-sequence Useful information for pupils and parents/carers can be found on the **Think-u-Know website** - http://www.thinkuknow.co.uk/8_10/ Share this link on your school website so that it can be easily accessed by families. **Privacy rules** How can pupils know if a website protects their private information? Pupils learn that children's websites must protect their private information. They learn how to identify these secure sites by looking for their privacy policies and privacy seals of approval. **Common Sense Media – Privacy Rules** https://www.commonsensemedia.org/educators/scope-and-sequence Pupils can design posters for **Net Nasties** and submit their work to **Kidsmart** - http://www.kidsmart.org.uk/netnasties/ Parents/carers also need to understand that not all websites are suitable for their children. Encourage parents to always check the websites used at home and to read the Parents Guide when available. You can make these guides available on your school website: http://www.kidsmart.org.uk/downloads/searchGuide.pdf http://www.childnet.com/parents-and-carers/hot-topics/parental-controls	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Advice and tips for staying safe online – useful questions to explore with pupils: http://www.bbc.co.uk/newsround/13910067 Smart Rules Poster http://www.childnet.com/ufiles/KidSMART-poster.pdf

What is cyberbullying? Watch this video - http://www.kidscape.org.uk/news/2013/nov/ronan-parke/ with pupils about Britain's Got Talent star Ronan Parke's new single, Defined, which will be raising money to help support Kidscape. This will help pupils to realise that bullying can happen to anyone. Pupils will learn the definition of cyberbullying and help to fill in a Venn diagram that compares in-person bullying with cyberbullying. They then read a story of a student who is cyberbullied, identifying the players involved and how the target might feel. **Common Sense Media – What's Cyberbullying?** https://www.commonsensemedia.org/educators/scope-and-sequence **Who can you talk to?** Discuss with pupils what they can do if they feel worried about something they have seen online http://www.thinkuknow.co.uk/8_10/report/ **How much have you learned?** At the end of this work, let pupils take the **Internet Safety Quiz** and discuss their results with them – how did they think they did? http://www.bbc.co.uk/newsround/14979083	

Learning to be e-safe -Year Six

Pupils will become familiar with digital media and associated vocabulary
Pupils will understand how others can access their private information online
Pupils discuss and identify where to go for help and support when they need it

Example Activities	Teacher notes and resource guide
Digital Life 101 Pupils will be introduced to the 24/7, social nature of digital media and technologies, and gain basic vocabulary and knowledge for discussing the media landscape. Teachers are advised to watch the video in this pack before the lessons in order to familiarise themselves with the content and to research anything they themselves don't understand! This work highlights a change from the media consumption culture of the past to today. Pupils learn about their digital lives and learn that because media connect us in more social and interactive ways than ever before, it is important to carry out online relationships responsibly. This lesson also serves as an assessment baseline for teachers to gain a better understanding of their pupils' familiarity with digital media and vocabulary associated with digital life. **Common Sense Media – Digital Life 101** https://www.commonsensemedia.org/educators/scope-and-sequence **Scams and Schemes** Pupils will learn strategies for guarding against identity theft and scams that try to access their private information online. The will learn what identity theft is, what kinds of information identity thieves want, and what can be done with that information. Students then analyse phony emails and identify tricks that identity thieves use online. Finally, they create a phishing email that includes the features that they have learned about, and see if classmates can identify the scams. **Common Sense Media – Scams and Schemes** https://www.commonsensemedia.org/educators/scope-and-sequence **Bringing it all together** Childnet have a drama that can be performed by pupils for the whole school or for parents. This 15 minute drama resource has been designed especially for teachers to use with their primary pupils. It is ideally performed by the pupils for their peers, other teachers, and parents to encourage a whole school community approach to e-safety. The play can also be performed as part of a school e-safety Activity Day with sessions for pupils and their parents. The key messages focus on online gaming and ways young people can stay safe whilst using these interactive technologies. Lesson plans, activities, and curriculum links are provided. http://www.childnet.com/resources/only-a-game	**Note for teachers** Common Sense Media have a vast range of resources and lesson plans that can support you when teaching e-safety. These resources will be referenced wherever possible so that you have quick access to the materials you need. South West Grid have also produced a Scheme of Work which you may find useful based on the Common Sense Media resources, which also identifies other curriculum opportunities. http://www.digital-literacy.org.uk/Curriculum-Overview.aspx **Suggested software and resources** Advice and tips for staying safe online – useful questions to explore with pupils: http://www.bbc.co.uk/newsround/13910067 **Smart Rules Poster** http://www.childnet.com/ufiles/KidSMART-poster.pdf

Who can you talk to? Discuss with pupils what they can do if they feel worried about something they have seen online http://www.thinkuknow.co.uk/8_10/report/	

Teacher and pupil record sheets

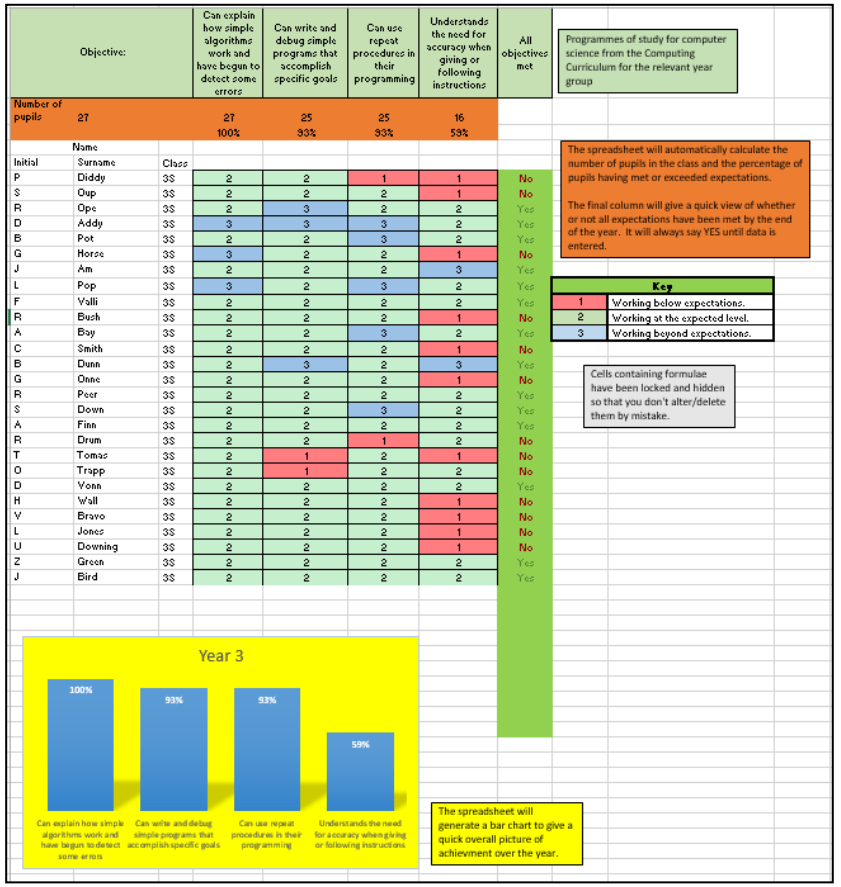
Computing Curriculum 2014

You may wish to use these record sheets to provide an overview of what has been taught in each year group.

The pupils record sheets lists the main objectives for each year group and can be used with pupils for them to record their learning.

The teacher record sheet identifies the objectives that have been taught in the previous year and the objectives that will be taught in the following year. They give teachers the opportunity to identify what needs to be revisited in the following year.

An optional Excel spreadsheet is included in the resources for those schools who wish to assess electronically.



Objective:			Can explain how simple algorithms work and have begun to detect some errors	Can write and debug simple programs that accomplish specific goals	Can use repeat procedures in their programming	Understands the need for accuracy when giving or following instructions	All objectives met
Number of pupils 27			27 100%	25 93%	25 93%	16 59%	
Initial	Name Surname	Class					
P	Diddy	3S	2	2	1	1	No
S	Oup	3S	2	2	2	1	No
R	Ope	3S	2	3	2	2	Yes
D	Addy	3S	3	3	3	2	Yes
B	Pot	3S	2	2	3	2	Yes
G	Horse	3S	3	2	2	1	No
J	Am	3S	2	2	2	3	Yes
L	Pop	3S	3	2	3	2	Yes
F	Valli	3S	2	2	2	2	Yes
R	Bush	3S	2	2	2	1	No
A	Bay	3S	2	2	3	2	Yes
C	Smith	3S	2	2	2	1	No
B	Dunn	3S	2	3	2	3	Yes
G	Onne	3S	2	2	2	1	No
R	Peer	3S	2	2	2	2	Yes
S	Down	3S	2	2	3	2	Yes
A	Finn	3S	2	2	2	2	Yes
R	Drum	3S	2	2	1	2	No
T	Tomas	3S	2	1	2	1	No
O	Trapp	3S	2	1	2	2	No
D	Vonn	3S	2	2	2	2	Yes
H	Wall	3S	2	2	2	1	No
V	Bravo	3S	2	2	2	1	No
L	Jones	3S	2	2	2	1	No
U	Downing	3S	2	2	2	1	No
Z	Green	3S	2	2	2	2	Yes
J	Bird	3S	2	2	2	2	Yes

Programmes of study for computer science from the Computing Curriculum for the relevant year group

The spreadsheet will automatically calculate the number of pupils in the class and the percentage of pupils having met or exceeded expectations.

The final column will give a quick view of whether or not all expectations have been met by the end of the year. It will always say YES until data is entered.

Key	
1	Working below expectations.
2	Working at the expected level.
3	Working beyond expectations.

Cells containing formulae have been locked and hidden so that you don't alter/delete them by mistake.

The spreadsheet will generate a bar chart to give a quick overall picture of achievment over the year.

Pupil focused objectives - Reception

Computer Science

- I know that some devices need instructions to work
- I know that instructions need to be given in the correct order
- I know that devices may not work if the instructions are wrong
- I can recognise devices that need instructions
- I can follow instructions
- I can follow a sequence of instructions in the correct order
- I can recognise when I haven't followed the instructions correctly
- I can give accurate instructions for others to follow
- I can program the floor turtle to move from one place to another
- I can sequence events in the correct order
- I can recognise where the mistake is in a sequence
- I can tinker and play with the floor turtle to discover what it can do
- I can program the turtle to follow a given set of instructions

Creativity

- I can recognise and name different types of technology
- I can log on and off from a computer correctly
- I can use a mouse to navigate around a screen and select options
- I can print my work
- I can talk about how devices can record both still and moving images

Online safety

- I know how to log in to a computer with my username and password
- I know the rules when using computers and technology in my school
- I know that I must follow rules when using the internet to keep myself safe
- I know who to go to for help when I am using the computers
- I know that you can use computers to find information and to create exciting things
- I know that a computer is not just for games
- I know that a computer can help me to learn
- I know that some information should be kept private and not shared with people I don't know

Pupil focused objectives - Year 1

Computer Science

- I can follow instructions accurately
- I can give accurate instructions
- I know that accurate instructions are important
- I know that computers follow instructions exactly as they are given
- I know that algorithms are a sequence of instructions
- I can write an accurate list of instructions
  I can follow instructions and recognise where there are mistakes
  I know that recognising and correcting mistakes in an algorithm is called debugging
- I can follow directional instructions accurately
- I know that algorithms needed to be written accurately to work
- I know that a mistake in an algorithm is called a bug
- I know that algorithms can be debugged to make them work correctly
- I can program an onscreen turtle to follow my instructions
- I know how the onscreen turtle will behave when given different instructions
- I know who to debug my program to make it work

Creativity

- I can recognise the difference between digital and traditional art
- I can identify features of digital art
- I can use technology to create digital images
- I can reflect on my work and make changes
- I can use a digital camera to take images
- I can import images into my work and record information about it
- I can use a digital photo editor to make changes to an original image
- I know that a digital camera can take still and moving images
- I can use a digital camera to record moving images and recognise some of the skills needed
- I know that data can be represented in a pictogram
- I know that a pictogram can display information clearly
- I can collect data to create my own pictogram

Online safety

- I know that everything on the internet is safe to visit and that I should only use websites I know are age appropriate
- I know that if I am unsure of a website that I should check with an adult
- I know that information stored online can easily found
- I know that any information I share online about myself can be found by others
- I understand what a digital footprint is
- I understand what a cyberbully is
- I know what to do if I feel I have been bullied online
- I know how to treat people with respect
- I know how to be safe when looking for information online
- I can use a search engine and understand keywords

Pupil focused objectives - Year 2

Computer Science

- I know how to use the shortened form of commands when writing a program
- I can predict what an algorithm will do
- I can spot errors in code and debug them
- I can write and test and algorithm
- I can test an algorithm to see if it works as I expected
- I can debug an algorithm so that it works as I expected
- I can use a visual programming language to make a sprite move across the screen
- I can recognise how the visual blocks compared to the language I used in turtle
- I can explore Scratch independently

Creativity

- I know that there are many different ways to communicate information
- I know that sometimes information can be lost or misunderstood
- I can use a digital video to record an event
- I can add detail to the video to communicate information effectively
- I can use a branching database to investigate questions
- I know how to formulate yes/no questions

Online safety

- I know that I should use a username and password to login to the school computer
- I understand that it is important to keep this information safe and not share it with anyone
- I can recognise the features of a powerful password
- I understand the difference between communication in person and online
- I know that I should always try to be respectful when communicating online
- I understand that sometimes messages sent online can be misunderstood
- I know that the internet allows us to communicate with people all around the world

Pupil focused objectives - Year 3

Computer Science

- I can predict the outcome of a given algorithm which uses the repeat command
- I can write, test and debug algorithms for regular polygons
- I know that the exterior angles of a regular polygons have a total of 360°
- I can use a repeat block in Scratch to program a repeating activity
- I can alter the script in Scratch to change the way the program behaves

Creativity

- I can recognise how text and graphics are combined in printed media
- I can talk about how the way graphics and text are arranged affect the balance of the finished product
- I can combine my own text and graphics to create a pleasing product
- I can talk about the variety of ways in which we can listen to sounds around us
- I can record and edit sounds and combine them to make a finished audio recording
- I know what data is and how it is used to combine large amounts of information
- I know how to use data effectively
- I can use a database to collect, organise and store information ready for sorting
- I can recognise different patterns in nature
- I can find and record patterns in nature on a digital camera
- I can display and discuss the images I have taken
- I can recognise and discuss different styles of animations
- I can create an animation using paper and pencil
- I can create an animation using the computer

Online safety

- I know that I must be responsible both online and offline
- I understand what it means to be a good digital citizen
- I know who I can talk to if I need help or feel unsure about something I have seen online
- I understand the implications of cyberbullying
- I know how to respond to hurtful messages I might receive
- I understand that I must be careful about the kind of information I share online
- I know that information I share online could be seen by people that don't know me

Pupil focused objectives - Year 4

Computer Science

- I know what an algorithm is
- I can write an algorithm
- I can use an algorithm
- I can improve my algorithm
- I can write a program that uses a repeat command
- I can explain what the repeats do in my program
- I know how to sequence a set of instructions
- I know how to write a procedure to teach the computer a new word
- I can write a procedure that uses a repeat command
- I can explain what my procedure does
- I know how to create a custom block to teach the computer a new word
- I know how the use the repeat block to repeat a set of instructions
- I can explain what my script does
- I know how to alter the values in the script to change the output

Creativity

- I can identify the features of a good presentation
- I can use my knowledge to create a presentation that is clear and easy to understand
- I can recognise where data is collected and used in the real world
- I know how to interpret the data presented in different graphing styles
- I know how to update and amend data
- I can collect data and represent it in graphical form
- I can present information that is easy to understand
- I can use the internet to research and collect information
- I can choose the best way to present data to a given audience
- I can plan and storyboard a film
- I can edit and combine my film clips
- I can add music to my film
- I can add title credits to my film
- I can produce a finished film to share with others

Online safety

- I understand that I must keep my passwords safe and not share them with others
- I understand the reasons why safe passwords are important
- I know how to recognise junk email and spam emails
- I know how to take care when checking the authenticity of email
- I can share the information I know about emails and good practice
- I understand the word plagiarism
- I know that I should not copy any type of work that belongs to other people
- I know that not everything you find on the internet is freely available to use
- I know who I can talk to if I need help or if I am worried about something I have seen online

Pupil focused objectives - Year 5

Computer Science

- I can recognise devices in the environment that rely on precise instructions to operate correctly.
- I know that devices need precise instructions to operate correctly.
- I can sequence a set of instructions in the correct order.
- I understand the process of a flowchart and can explain what is happening.
- I understand the symbols used in a flowchart and what they mean.
- I can construct a flowchart for a given set of instructions.
- I can investigate a Scratch script and explain what is happening.
- I can alter and adapt a Scratch script to alter the behaviour.

Creativity

- I know that not all images I see in different media are necessarily true and accurate
- I can manipulate digital images to make them look different from the original
- I can plan, design and film 3D animation
- I understand the difference between different animation types
- I can investigate a spreadsheet
- I understand how a spreadsheet can be used
- I understand why a spreadsheet is useful

Online safety

- I know the things I should do to keep myself safe online
- I know that not all websites keep your information private and that some will share your details with others
- I can recognise a safe and secure website
- I understand what is meant by cyberbullying and how it can affect people who experience it
- I know what to do if I feel unsafe online or need to talk to someone about something I am worried about

Pupil focused objectives - Year 6

Computer Science

- I can talk about how I interact with computers and understand that this is not the same as creating media with computers
- I can explain what the functions of the basic blocks in Scratch do
- I can use the basic blocks in Scratch to create an interactive animation
- I can design and create my own project in Scratch and discuss what it does and how it could be improved
- I can explain how a project in Scratch is compiled
- I can remix a project in Scratch to make it behave in a different manner
- I can use Scratch to create a game for others to play
- I can produce associated media that explains how the game works

Creativity

- I understand the difference between the internet and the world wide web (www)
- I can use a search engine effectively and understand the results are determined by the search term I use
- I understand what is meant by the term 'the internet'
- I know how information is transferred via the internet and how this information can be found
- I know how people and countries can communicate through the world wide web
- I can present information about the internet and the www suitable for a young audience to understand
- I can explore a spreadsheet to find answers
- I know how to input formulae in a spreadsheet to calculate different values
- I can use a spreadsheet to model an event

Online safety

- I recognise how digital media has changed the way that people consume and share information
- I understand what identify theft it and how it can affect people
- I understand the reasons for keeping personal information safe
- I have shared the key points I have learned about online safety with my friends and family
- I know who I can talk to and what to do if I feel unsure about something I have seen online or feel worried

Sample Class Assessment Record

Reception Objectives:
Pupils will recognise devices that follow instructions
Pupils will be able to follow instructions given by the teacher
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to sequence a simple set of instructions in the correct order

The teacher can see at a glance what was taught in the previous year group.

In Y1 pupils will:	Give directional instructions that can be understood and followed	Understand the need for accuracy when giving instructions	Share and discuss their knowledge of directional language with their peers	Begin to create and debug simple programs
Taught in term:	Spring Term 2014	Summer Term 2014	Autumn 2014	Autumn 2014
Understood by most	yes	yes	yes	yes
Understood by some		Some rushed their work and didn't pay enough attention to the importance of accuracy		Some found it difficult to work out why their program wasn't working correctly
Pupils who extended their knowledge further				Julian was really good at this and I was able to give him more complicated challenges to complete
What needs to be revisited in Year 2	Need to keep stressing the need for accuracy when giving instructions and to help them persevere in trying to work out why something doesn't work first time and to not give up!			

This table can be used to record the names of pupils who did not achieve as expected and those who exceeded expectations.

Year 2 Objectives:
Pupils will understand what algorithms are
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to create and debug simple programs
Pupils will be able to predict the behaviour of simple programs and explain their reasoning

The teacher can see at a glance what will be expected of the pupils in their next year group.

Learning to be computer scientists in Reception Record Sheet

In Reception pupils will:	Recognise that devices follow instructions	Follow instructions given by the teacher	Understand the need for accuracy when giving or following instructions	Sequence a simple set of instructions in the correct order
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 1				

Year 1 Objectives:
Pupils will be able to give directional instructions that can be understood and followed
Pupils will understand the need for accuracy when giving instructions
Pupils will share and discuss their knowledge of directional language with their peers
Pupils will begin to create and debug simple programs using directional language

Learning to be computer scientists in Year One Record Sheet

Reception Objectives:
Pupils will recognise devices that follow instructions
Pupils will be able to follow instructions given by the teacher
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to sequence a simple set of instructions in the correct order

In Y1 pupils will:	**Give directional instructions that can be understood and followed**	**Understand the need for accuracy when giving instructions**	**Share and discuss their knowledge of directional language with their peers**	**Begin to create and debug simple programs**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 2				

Year 2 Objectives:
Pupils will understand what algorithms are
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to create and debug simple programs
Pupils will be able to predict the behaviour of simple programs and explain their reasoning

Learning to be computer scientists in Year Two Record Sheet

Year One Objectives:
Pupils will be able to give directional instructions that can be understood and followed
Pupils will be introduced to the word algorithm
Pupils will understand the need for accuracy when giving instructions
Pupils will share and discuss their knowledge of directional instructions with their peers
Pupils will begin to create and debug simple programs using directional language

In Y2 pupils will:	**Understand what algorithms are**	**Understand the need for accuracy when giving or following instructions**	**Be able to create and debug simple programs**	**Be able to predict the behaviour of simple programs and explain reasoning**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 3				

Year 3 Objectives:
Pupils will explain how simple algorithms work and will start to spot some errors
Pupils will be able to write and debug simple programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will understand the need for accuracy when giving or following instructions

Learning to be computer scientists in Year Three Record Sheet

Year Two Objectives:
Pupils will understand what algorithms are
Pupils will understand the need for accuracy when giving or following instructions
Pupils will be able to create and debug simple programs
Pupils will be able to predict the behaviour of simple programs and explain their reasoning

In Y3 pupils will:	Explain how simple algorithms work and start to spot errors	Write and debug simple programs that accomplish specific goals	Use repeat procedures in their programs	Understand the need for accuracy when giving or following instructions
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 4				

Year 4 Objectives:
Pupils will explain how algorithms work and will be able to detect errors
Pupils will be able to write and debug programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will be able to write a procedure that instructs the turtle to draw a flower
Pupils will apply their knowledge of the importance of accuracy when giving instructions

Learning to be computer scientists in Year Four Record Sheet

Year Three Objectives:
Pupils will explain how simple algorithms work and will start to spot some errors
Pupils will be able to write and debug simple programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will understand the need for accuracy when giving or following instructions

In Y4 pupils will:	Explain how algorithms work and detect simple errors	Write and debug programs	Use repeat and write procedures	Be accurate in their programming
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 5				

Year 5 Objectives:
Pupils will be able to write programs that control or simulate physical systems
Pupils will begin to solve problems by decomposing them into smaller parts
Pupils will apply their knowledge of the importance of accuracy when giving instructions
Pupils will understand how input/output devices work

Learning to be computer scientists in Year Five Record Sheet

Year Four Objectives:
Pupils will explain how algorithms work and will be able to detect errors
Pupils will be able to write and debug programs that accomplish specific goals
Pupils will be able to use repeat procedures in their programs
Pupils will be able to write a procedure that instructs the turtle to draw a flower
Pupils will apply their knowledge of the importance of accuracy when giving instructions

In Y5 pupils will:	Write programs that control or simulate physical systems	Use decomposition to solve problems	Will be accurate in their work	Understand how input/output devices operate
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 6				

Year 6 Objectives:
Pupils will be able to write and debug programs that accomplish specific goals
Pupils will be able to solve problems by decomposing them into smaller parts
Pupils will be able to use logical reasoning to explain how simple algorithms work and to detect and correct errors
Pupils will apply their knowledge of the importance of accuracy when giving instructions

Learning to be computer scientists in Year Six Record Sheet

Year Five Objectives:
Pupils will be able to write programs that control or simulate physical systems
Pupils will begin to solve problems by decomposing them into smaller parts
Pupils will apply their knowledge of the importance of accuracy when giving instructions
Pupils will understand how input/output devices work

In Y6 pupils will:	Write and debug programs that accomplish specific goals	Use decomposition to solve problems	Apply reasoning to explain algorithms and to detect errors	Will be accurate when giving instructions
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 7				

You will find it beneficial to find out what pupils will be learning in Year 7 and what will be expected of them.

Learning to be creative in Reception Record Sheet

In Reception pupils will:	Know how to login to the computer	Be able to use a suitable tracking device to navigate a screen	Be able to enter text on screen and print work	Recognise the difference between a digital and moving image	Have explored the role of ICT in the world around them
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended their knowledge further					
What needs to be revisited in Year 1					

Year 1 Objectives:
Pupils will be able to use a computer to create and develop digital art work
Pupils will be able to use a digital camera to record selected images
Pupils will be able to use images they have taken within other software packages
Pupils will be able to use a digital video camera to record a class activity
Pupils will be able to use ICT to represent information graphically and begin to interpret that data accurately

Learning to be creative in Year One Record Sheet

Reception Objectives:

Pupils will know how to log on and off from a computer
Pupils will be able to use a mouse or tracking device to navigate around a computer screen
Pupils will know how to print work
Pupils will be able to enter text on screen
Pupils will know the difference between a digital image and a moving image (digital camera/video camera)
Pupils will explore the role of ICT in the world around them

In Y1 pupils will:	Use a computer to create and develop digital art work	Use a digital camera to record selected images	Use images they have taken in other software packages	Use a digital video camera to record a class activity	Use ICT to represent information graphically and begin to interpret that data accurately
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended their knowledge further					
What needs to be revisited in Year 2					

Year 2 Objectives:

Pupils will learn that technology can be used to communicate ideas
Pupils will recognise common uses of information technology beyond school
Pupils will recognise that some forms of communication are better than others
Pupils will be able to create, store and retrieve digital content

Learning to be creative in Year Two Record Sheet

Year One Objectives:
Pupils will be able to use a computer to create and develop digital art work
Pupils will be able to use a digital camera to record selected images
Pupils will be able to use images they have taken in other software packages
Pupils will be able to use a digital video camera to record a class activity
Pupils will be able to use ICT to represent information graphically and begin to interpret that data accurately

In Y2 pupils will:	**Learn that technology can be used to communicate ideas**	**Recognise common uses of information technology beyond school**	**Recognise that some forms of communication are better than others**	**Be able to create, store and retrieve digital content**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 3				

Year 3 Objectives:
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will collect and present data accurately including branching databases
Pupils will be able to use search technologies effectively to locate appropriate resources needed for their work
Pupils will understand the principles of animation

Learning to be creative in Year Three Record Sheet

Year Two Objectives:
Pupils will learn that technology can be used to communicate ideas
Pupils will recognise common uses of information technology beyond school
Pupils will recognise that some forms of communication are better than others
Pupils will be able to create, store and retrieve digital content

In Y3 pupils will:	**Use and combine a variety of software to design and create digital and printed media**	**Collect and present data accurately including branching databases**	**Use search technologies effectively to locate appropriate resources for their work**	**Understand the principles of animation**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 4				

Year 4 Objectives:
Pupils will use and combine a variety of software to design and create digital and printed presentations
Pupils will recognise and use good features of digital presentation
Pupils will collect and analyse and present data accurately
Pupils will be able to make simple edits to a film

Learning to be creative in Year Four Record Sheet

Year Three Objectives:
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will collect and present data accurately including branching databases
Pupils will be able to use search technologies effectively to locate appropriate resources needed for their work
Pupils will understand the principles of animation

In Y4 pupils will:	**Use and combine a variety of software to design/create digital and printed presentations**	**Recognise and use good features of digital presentation**	**Collect, analyse and present data accurately**	**Make simple edits to a film**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 5				

Year 5 Objectives:
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will recognise that technology can be used to alter and manipulate images
Pupils will explore and create 3D animation
Pupils will recognise the benefits of using a spreadsheet to manipulate data

Learning to be creative in Year Five Record Sheet

Year Four Objectives:
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will recognise and use good features of digital presentation
Pupils will collect and analyse and present data accurately
Pupils will be able to make simple edits to a film

In Y5 pupils will:	Use and combine a variety of software to design and create digital and printed media	Recognise that technology can be used to alter an manipulate images	Explore and create 3D animation	Recognise the benefits of using a spreadsheet to manipulate data
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 6				

Year 6 Objectives:
Pupils will use and combine a variety of software to design and create digital and printed media for a given audience
Pupils will collect and analyse and present data accurately within a spreadsheet
Pupils will understand computer networks including the internet and the services they provide (world wide web)
Pupils will use search engines effectively in research
Pupils will recognise how these services offer opportunities for communication and collaboration

Learning to be creative in Year Six Record Sheet

Year Five Objectives:
Pupils will recognise that technology can be used to alter and manipulate images
Pupils will use and combine a variety of software to design and create digital and printed media
Pupils will explore and create 3D animation
Pupils will recognise the benefits of using a spreadsheet to manipulate data

In Y6 pupils will:	**Use and combine a variety of software to design/create digital/printed media for a given audience**	**Collect and present data within a spreadsheet**	**Understand and explore computer networks**	**Recognise how internet services offer opportunities for communication and collaboration**	**Use search engines effectively in research**
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended their knowledge further					
What needs to be revisited in Year 7					

You will find it beneficial to find out what pupils will be learning in Year 7 and what will be expected of them.

Learning to be e-safe in Reception Record Sheet

In Reception pupils will:	Learn how to login to school computers safely	Learn that staying safe online is similar to staying safe in the real world	Learn the school rules for staying safe on the internet	Understand the importance of asking for help from an adult when using technology	Learn how to use the internet to find information
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended their knowledge further					
What needs to be revisited in Year 1					

Year 1 Objectives:
Pupils will learn that they may leave a digital footprint when using the internet
Pupils will learn ways for staying safe when using the internet
Pupils will learn that they can use the computers to discover new ideas and visit new places
Pupils will learn how people can use the internet to bully others and where they can go for help

Learning to be e-safe in Year One Record Sheet

Reception Objectives:
Pupils will learn how to login to the school computers safely
Pupils will learn that staying safe online is similar to staying safe in the real world
Pupils will learn the school rules for staying safe on the internet
Pupils will understand the importance of asking for help from an adult when on the internet or using computers
Pupils will learn how they can use the internet to find information

In Y1 pupils will:	**Learn that they can leave a digital footprint when using the internet**	**Learn how to stay safe when using the internet**	**Learn that they can use computers to discover new ideas and visit new places**	**Learn how people can use the internet to bully others**	**Learn where they can go for help if they feel unsafe or unsure**
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended their knowledge further					
What needs to be revisited in Year 2					

Year 2 Objectives:
Pupils will learn why passwords are important and the reasons for keeping them private
Pupils will learn that computers can be used to communicate with people close and far away
Pupils will learn that they must use technology safely and respectfully

Learning to be e-safe in Year Two Record Sheet

Year One Objectives:
Pupils will learn that they may leave a digital footprint when using the internet
Pupils will learn ways for staying safe when using the internet
Pupils will learn that they can use the computers to discover new ideas and visit new places
Pupils will learn how people can use the internet to bully others and where they can go for help

In Y2 pupils will:	Learn why passwords are important and the reasons for keeping them private	Learn that computers can be used to communicate with people close and far away	Learn that they must use technology safely and respectfully	Notes
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 3				

Year 3 Objectives:
Pupils will learn how they can protect themselves online and discuss the information they share with others
Pupils will learn where they can go for help and support when they have concerns
Pupils will learn that they must use technology safely and respectfully

Learning to be e-safe in Year Three Record Sheet

Year Two Objectives:
Pupils will learn why passwords are important and the reasons for keeping them private
Pupils will learn that computers can be used to communicate with people close and far away
Pupils will learn that they must use technology safely and respectfully

In Y3 pupils will:	**Learn how they can protect themselves online and discuss the information they share with others**	**Learn where they can go for help and support when they have concerns**	**Learn that they must use technology safely and respectfully**	
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year				

Year 4 Objectives:
Pupils will learn the importance of using and keeping safe their passwords
Pupils will understand the term plagiarism
Pupils will know what spam is and how to deal with it
Pupils will be able to demonstrate the importance of keeping personal information private

Learning to be e-safe in Year Four Record Sheet

Year Three Objectives:
Pupils will learn how they can protect themselves online and discuss the information they share with others
Pupils will learn where they can go for help and support when they have concerns
Pupils will learn that they must use technology safely and respectfully

In Y4 pupils will:	Learn the importance of using and keeping safe their passwords	Will understand the term plagiarism	Will know what spam is and how to deal with it	Be able to demonstrate the importance of keeping personal information private
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 5				

Year 5 Objectives:
Pupils will be learn that they must keep their personal information private when online
Pupils learn how to identify secure sites that they can use safely
Pupils compare cyberbullying and in-person bullying and learn strategies for coping with it
Pupils discuss and identify where to go for help and support when they need

Learning to be e-safe in Year Five Record Sheet

Year Four Objectives:
Pupils will learn the importance of using and keeping safe their passwords
Pupils will understand the term plagiarism
Pupils will know what spam is and how to deal with it
Pupils will be able to demonstrate the importance of keeping personal information private

In Y5 pupils will:	**Learn that they must keep their personal information private when online**	**Learn how to identify secure sites that they can use safely**	**Compare cyberbulling and in-person bullying and learn strategies for coping with it**	**Discuss and identify where to go for help and support when they need it**
Taught in term:				
Understood by most				
Understood by some				
Pupils who extended their knowledge further				
What needs to be revisited in Year 6				

Year 6 Objectives:
Pupils will become familiar with digital media and associated vocabulary
Pupils will understand how others can access their private information online
Pupils discuss and identify where to go for help and support when they need it

Learning to be e-safe in Year Six Record Sheet

Year Five Objectives:
Pupils will be learn that they must keep their personal information private when online
Pupils learn how to identify secure sites that they can use safely
Pupils compare cyberbullying and in-person bullying and learn strategies for coping with it
Pupils discuss and identify where to go for help and support when they need it

In Y6 pupils will:	**Become more familiar with digital media and associated vocabulary**	**Understand how others can access their private information online**	**Discuss and identify where to go for help and support when they need it**		
Taught in term:					
Understood by most					
Understood by some					
Pupils who extended th eir knowledge further					
What needs to be revisited in Year 7					

You will find it beneficial to find out what pupils will be learning in Year 7 and what will be expected of them.

Key Words

Algorithm
A list of steps that allow you to complete a task

Computer Science
Combining human ideas with digital tools to help solve problems

Computational Thinking
Thinking logically to develop algorithms for solving problems

Debug
Find and remove the mistakes in a computer program to make it work correctly

Abstraction
Removing the details from a solution so that it will work for many problems

Decompose
Break a hard problem up into smaller parts to make it easier to solve

Program
A set of instructions that can be followed and understood by a machine

Input
Information provided **to** a computer system using a device like a touch screen, keyboard, mouse, microphone, camera or sensors

Output
Information provided **by** a computer on a screen, through speakers, on a printer or by controlling devices attached to it

Repetition
When one or more instructions are repeated, perhaps a certain number of times, until a condition is satisfied or until the program is stopped

Quick reference to the resources

Learning to be computer scientists

Reception

Help I need Instructions PowerPoint

Year 1

Salad Sandwich PowerPoint
Instructions are out there PowerPoint
Design a robot worksheet

Year 2

Making it Simple PowerPoint

Year 3

Repeats PowerPoint

Year 4

Scratch Square Procedure hand-out
Scratch Square Procedure teacher notes

Year 5

Devices in the environment PowerPoint
Flowchart examples PowerPoint
Flow chart symbols and their meaning

Year 6

Scratch introduction PowerPoint

Learning to be creators

Reception

Emotions PowerPoint

Year 1

Digital Art in the Real World PowerPoint
Travelling Around PowerPoint
Travelling Around tally chart

Year 2

Sharing Information PowerPoint
20 Question Cards

Year 3

Dinosaur Poem with sound effects
Dinosaur Poem without sound effects
Dinosaur Poem sheet
Help Sheet for Audacity
Patterns in Nature PowerPoint
Mini beast data cards

Year 4
PowerPoint How to Make a Cupcake 1 and 2
How to make cupcakes leaflet

Year 5
Believing is Seeing PowerPoint
Spot the Difference PowerPoint
Shopping list Excel

Year 6
Picture the Internet PowerPoint

Excel Spreadsheet
For schools who wish to record attainment electronically.

Notebook Labels
Single PDF Copy of the notebook labels

Scratch
Comparison of Scratch Jnr and Scratch blocks for reference

Computing Notebook

Name: _____

Date started: _____

Date finished: _____

Bits and bytes of information

Computing Notebook

Name: _____

Date started: _____

Date finished: _____

Bits and bytes of information

Computing Notebook

Name: _____

Date started: _____

Date finished: _____

Bits and bytes of information

Computing Notebook

Name: _____

Date started: _____

Date finished: _____

Bits and bytes of information