Computing Handbook

Year 4

Vision for Computing

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

At ***INSERT SCHOOL NAME*** we intend to

- Enable our children to reach their full potential and recognise their strengths and talent through a progressive, inclusive creative curriculum.
- To further develop the skills learnt in the computing lesson so that they can be used across all subjects. Cross-curricular computing throughout the curriculum should be encouraged.
- Access to learning platforms from home will help raise standards and enhance learning (Education City, Reading Plus, TT Rock Stars).

Scheme Of Work

We have a bespoke curriculum that is ever evolving to suit the needs of the children at school. We have recently carried out a review and have adapted it to meet the ever-evolving needs of our children at school.

In year 4 we are looking to develop the following skills:

Skills Overview Year 1		
Computer Science	DL & IT Beyond school	Information Technology
● Design simple algorithms using loops and repeats, whilst detecting and correcting errors is debugging. ● Write and execute an efficient program, using loops such as forever, repeat & repeat until commands. ● Decompose a problem into smaller parts with some verbal reasoning. ● Has an understanding of how sequencing, using inputs and repetition in programs has specific effects on the output, works with 'loops' and understands their effect. ● Recognise that an algorithm will help to sequence more complex programs. Use logical reasoning to predict and debug more complex programs including loops and repeats.	● Understand that media can be edited online for advertising and other purposes. ● Recognise what is acceptable and unacceptable behaviour when using technology and online services. ● Children understand how effective a strong password is and what a strong password looks like ● Understand the difference between the Internet and online services such as the World Wide Web, instant messaging and email. ● Tell you whether a resource they are using is from the World Wide Web, the school network or their own work. ● Identify key words to use when searching safely on the World Wide Web. ● Show an awareness of a range of Internet services such as the World Wide Web, email and instant messaging. • Explain how to check who owns photos, text and clipart.	● Demonstrate the different ways data can be organised. ● Demonstrate the different ways data can be converted into information. ● Make a branching database. ● Collect data and identify where it could be inaccurate. ● Plan, create and search a database. ● Select the best way to present data to a specific audience. ● Log data using a device. ● Use photos, video and sound to create an atmosphere when presenting to different audiences. ● Be confident to explore new media to extend what they can achieve. ● Change the appearance of text to increase its effectiveness depending on the audience or mood. ● Create, modify and present documents for a particular purpose and audience. ● Use a keyboard confidently and make use of a spellchecker to write and review their work. ● Use an appropriate tool to share their work and collaborate online.

		Be able to evaluate other people's work and give them constructive feedback to help them improve their work.

Year 4 Curriculum Overview

Year 4	*Autumn 1*	*Autumn 2*	*Spring 1*	*Spring 2*	*Summer 1*	*Summer 2*
	IT	*COMPUTER SCIENCE*	*COMPUTER SCIENCE*	*DIGITAL LITERACY*	*DIGITAL LITERACY*	*IT*
	Pupils learn about the concept of branching database and create their own using presentation software.	*Repetition and forever loops*	*Use Scratch to design, plan and create a program*	*Pupils to create own videos and apply special effects to them.*	*Understand what a network is and the parts of the local network in our school.*	*Create art using and creating a key in Microsoft Excel*

Autumn 1 - *Pupils learn about the concept of branching database and create their own using presentation software*

What the children will learn:

- Demonstrate the different ways data can be organised.
- Demonstrate the different ways data can be converted into information.
- Make a branching database.
- Collect data and identify where it could be inaccurate.
- Plan, create and search a database.
- Select the best way to present data to a specific audience.
- Log data using a device.

Vocabulary

- Branching database, database, organise, transition, slides, log.

Ways to support children's learning

- Talk to the children about what a database is – a store of information or data. There are many common examples such as phone books, catalogues and contacts lists on your phone. Talk about the different ways in which you can search those databases – using page numbers, categories etc.

- Show them the following video which explains what a database is. Also gives examples:https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/z8yk87h
- Play Top Trumps with the children. These are perfect examples of a database – each card is a record, each section of information is a field (Name, power etc)
- Get children to create their own Top Trump cards based on a topic of their choice.
- https://www.instructables.com/id/How-to-make-top-trump-cards/

Autumn 2 - *Repetition and forever loops*

What the children will learn:

- Design simple algorithms using loops and repeats, whilst detecting and correcting errors is debugging.
- Write and execute an efficient program, using loops such as forever, repeat & repeat until commands.
- Decompose a problem into smaller parts with some verbal reasoning

Vocabulary

- Repeat, forever, loop, code, debug, algorithm, sequence and selection.

Ways to support children's learning

- Discuss with your children the different types of instructions they follow to complete a task – these are examples of an algorithm
- Get them to put together their own dance routine or complex jump sequence.
- Talk to them about what debugging is – spot mistakes and changing them so the routine works. This video explains the concept. https://www.bbc.co.uk/bitesize/topics/zkcqn39/articles/ztkx6sg
- Following websites have examples of coding games, which include repeats and loops.
- https://code.org/minecraft Minecraft Hour Of Code
- https://code.org/starwars Star Wars Hour of code
- https://codecombat.com/play/dungeon Code Combat

Spring 1 - *Use Scratch to design, plan and create a program*

What the children will learn:

- Has an understanding of how sequencing, using inputs and repetition in programs has specific effects on the output, works with 'loops' and understands their effect.
- Recognise that an algorithm will help to sequence more complex programs.
- Use logical reasoning to predict and debug more complex programs including loops and repeats.

Vocabulary

- Sequence, variable, algorithm, code, repeat, loop, input, output, device

Ways to support children's learning

- The children will be using Scratch in this lesson. The program is now available online and contains various tutorials that you can run through with your child. It is available on PC and will run on IPad.
- https://scratch.mit.edu/projects/editor/?tutorial=home Click on tutorials for examples.

Spring 2 - *Pupils create their own videos and apply special effects to them (Information Technology). Learn how photos/videos can be edited online for advertisement (Digital Literacy)*

What the children will learn:

- Use photos, video and sound to create an atmosphere when presenting to different audiences.
- Be confident to explore new media to extend what they can achieve.
- Change the appearance of text to increase its effectiveness depending on the audience or mood.
- Create, modify and present documents for a particular purpose and audience.

Vocabulary

- Video, Special effects, CGI, Green screen, Audio, Image, Text.

Ways to support children's learning

- Give your children the opportunity to take photographs with a phone or with an IPad. Experiment with the different effects. There are many photography apps that can be used to play around with the effects on the photo.
- Review the photos that the children have taken and take about what makes a good photograph. Not blurred, well framed
- Practise editing the photos using things such as the crop tool to take out unwanted objects.
- Use the photos to make a film – Use IMovie on the IPad or alternatively you may be able to find a copy of Moviemaker on the PC.
- IMovie now includes a Green Screen facility to add special effects like those in the movies. https://support.apple.com/kb/PH22929?locale=en_GB (Guide)

- Alternatively there apps such as Doink Green Screen app, which can be purchased from apple store.

Summer 1 - *Understand what a network is and the parts of the local network in our school (Computer Science). Pupils understand why a password is important and what a good password looks like (Digital Literacy)*

What the children will learn:

- Understand the difference between the Internet and online services such as the World Wide Web, instant messaging and email.
- Tell you whether a resource they are using is from the World Wide Web, the school network or their own work.
- Show an awareness of a range of Internet services such as the World Wide Web, email and instant messaging.
- Recognise what is acceptable and unacceptable behaviour when using technology and online services.
- Children understand how effective a strong password is and what a strong password looks like.

Vocabulary

- WAN, LAN, network, router, Wi-Fi, wireless, Local, cable, connection, binary, modem, switch, server.

Ways to support children's learning

- Following video explains what a network is https://www.youtube.com/watch?v=Dxcc6ycZ73M
- Tis video explains how the Internet works: https://www.bbc.co.uk/bitesize/clips/zsyr9j6
- This may be a good time to discuss internet safety and what is acceptable and unacceptable behaviour. Watch the following video with your child and discuss the main points: **https://www.bbc.co.uk/newsround/13908828**
- Play the Internet Legend's game: https://beinternetlegends.withgoogle.com/en_uk/interland
- Discuss what makes a good password (Capital letter, symbol, 8 characters or more, no identifiable data used such as DOB)
- Test your password safety using the following link which shows how long it would take a hacker to find your password. https://howsecureismypassword.net/

Summer 2 - *Create art using and creating a key in Microsoft Excel*

What the children will learn:

- Use a keyboard confidently and make use of a spellchecker to write and review their work.
- Use an appropriate tool to share their work and collaborate online.
- Be able to evaluate other people's work and give them constructive feedback to help them improve their work.
- Be confident to explore new media to extend what they can achieve.

Vocabulary

- Spreadsheets, rows, columns, algebra, formula, pixel, binary.

Ways to support children's learning

- Discuss with the children what binary is. Video from the BBC will explain https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/zx3q7ty
- Get children to create their own art just using black and white squares.
- **https://studio.code.org/s/pixelation/stage/2/puzzle/1**

Online safety

At ***INSERT SCHOOL NAME*** we understand the importance of keeping your child safe online. Here are a few tips and websites to help you and your child understand the message.

Home and Family Guidelines

- Talk together and have fun learning together.
- Involve everyone and agree your family guidelines and rules.
- Remember that sometimes what is acceptable for a Year 6 child is not necessarily acceptable for a Year 3 or Reception child.
- Discuss regularly online safety and go online with your children. Communication is the key to eSafety.
- Keep virus and firewall software up to-date.
- Enable your 'browser safe' search option and/or consider using internet filtering software, walled gardens and child-friendly search engines.
- Keep the computer in a communal area of the house, where it's easier to monitor what your children are viewing. Never let children have webcams, or similar, in their bedroom.
- Talk to your children about why they should not to give out their personal details. If they want to subscribe to any online service then make up a family email address to receive the mail.

- We all love to chat and children are no different. Encourage your children to use moderated chat rooms and never to meet up with an online 'friend' without first discussing it with you.
- Time children spend offline following a range of other activities is equally important. Time spent online should be monitored to help prevent obsessive use of the internet
- Encourage your children, and in fact all family members, to tell you if they feel uncomfortable, upset or threatened by anything they see online.
- Have proportionate responses if the family guidelines are not followed.

Websites for you to use with your child to help with the eSafety conversation

Thinkuknow website... this website has been specially developed by CEOP for children of all ages to help them to learn about staying safe online. There's information for parents here too. https://www.thinkuknow.co.uk/

Kidsmart... Help and advice for children using the Internet.

https://www.childnet.com/resources/looking-for-kidsmart

Play, like share videos – Three videos that look at sharing content, passwords and meeting strangers.

Play like share Video game – game connected with the videos that explore the points that are covered in the videos.
https://www.bbc.com/ownit/take-control/thinkuknow-band-runner