



# St Paul's Computing Progression Document

## Computing Intent Statement

At St Paul's CE Primary school we will "Start children off on the way they should go..." by enabling children to:

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

# Computing: Computing systems and networks

## **EYFS (Barefoot Computing):**

Anticipate and explain concepts.  
Play and explore.

## **Year 1:**

Name the parts of a computer.  
Use a mouse to open a program  
and select objects on a screen.  
Use a keyboard for typing.  
Save work in a folder.

## **Year 4:**

Describe how networks physically connect to other network.  
Recognise how networked devices make up the internet.  
Outline how websites can be shared via the World Wide Web.  
Describe how content can be added and accessed on the World Wide Web.  
Recognise how the content of the World Wide Web is created by people.  
Evaluate the consequences of unreliable content.

## **Year 3:**

Explain how digital devices function.  
Identify input and output devices.  
Recognise how digital devices can change the way we work.  
Explain how a computer network can be used to share information.  
Explore how digital devices can be connected.  
Recognise the physical components of a network.

## **Year 2:**

Recognise the uses and features of information technology.  
Identify information technology in the home, school and beyond.  
Explain how information technology benefits us.

## **Year 5:**

Explain that computers can be connected together to form systems.  
Recognise the role of the computer systems in our lives.  
Recognise how information is transferred over the internet.  
Explain how sharing information online lets people in different places work together.  
Contribute to a shared project online.  
Evaluate different ways of working together online.

## **Year 6:**

Identify how to use a search engine.  
Describe how search engines select results.  
Explain how search results are ranked.  
Recognise why the order of results is important, and to whom.  
Recognise we can communicate using technology.  
Evaluate different methods of online communication.

## **Year 7 (from main feeder school):**

Describe the function of the hardware components used in computing systems.  
Describe how hardware components work together in order to execute programs.  
Provide a broad definition of 'operating systems'.  
Recall the role of an operating system in controlling program execution.  
Understand the binary data system.

# Computing: Creating media 1

## EYFS (Barefoot computing):

Make things.  
Check things  
Fix things.

## Year 1:

Use tools, shapes and lines to create a digital painting.  
Compare computer art and painting.  
Add and remove text to a program.  
Change the look of text on a computer.  
Compare writing on a computer with writing on paper.

## Year 4:

Explain that digital images can be changed.  
Change the composition of an image.  
Describe how images can be changed for different uses.  
Make good choices when selecting different editing tools.  
Recognise that not all images are real.  
Evaluate how changes can improve an image.

## Year 3:

Recognise how text and images convey information.  
Recognise that text and layout can be edited.  
Choose appropriate page settings.  
Add content to a desktop publishing publication.  
Consider how different layouts can suit different purposes.  
Consider the benefits of desktop publishing.

## Year 2:

Create, review and edit music digitally.  
Use a device to take a photograph and use software to edit and improve it.

## Year 5:

Identify that drawing tools can be used to produce different outcomes.  
Create a vector drawing by combining shapes.  
Use tools to achieve a desired effect.  
Recognise that vector drawings consist of layers.  
Group objects to make them easier to work with.  
Evaluate a vector drawing.

## Year 6:

Use a computer to create and manipulate three-dimensional (3D) digital objects.  
Compare working digitally with 2D and 3D graphics.  
Construct a digital 3D model of a physical object.  
Know that physical objects can be broken down into a collection of 3D shapes.  
Design a digital model by combining 3D objects.  
Develop and improve a digital 3D model.

## Year 7 (from main feeder school):

Understand how fonts, colours and images convey meaning.  
Understand the importance of resolution when selecting or printing an image.  
Learn how to use and manipulate layers to create a final image.  
Create and save a graphic in a format that preserves the layers.  
Understand how a bitmap graphic is made up of individual pixels.  
Understand that the number of bits per pixel determines the number of available colours for an image.  
Compare the different characteristics, strengths and uses of vector and bitmap images.  
Manipulate vector and bitmap images.

# Computing: Programming

## EYFS (Barefoot Computing):

Work out what is important  
and what is not.

Create instructions and  
sequences

### Year 1:

Understand what algorithms are.  
Plan a simple program to move a floor robot  
forwards, backwards, left and right.  
Plan and debug simple routes.  
Predict where the robot will move to.  
Enter commands to move sprites.  
Join commands together to make a simple program.  
Predict what will happen when changes are made to  
algorithms.

### Year 4:

Create a program in a text-based language.  
Explain what repeat means.  
Modify a count-controlled loop to produce a given  
outcome.  
Decompose a task into small steps.  
Create a program that uses count controlled loops to  
produce a given outcome.  
Develop the use of count-controlled loops in a  
different programming environment.  
Develop a design that includes two or more loops which  
run at the same time.  
Modify an infinite loop in a given program.  
Design and create a project that includes repetition.

### Year 3:

Identify that commands have an outcome.  
Explain that a program has a start.  
Change the appearance of an object.  
Create a project from a task description.  
Create a program to move a sprite in 4 directions.  
Adapt a new program to a new context.  
Develop a program by adding features.  
Identify and fix bugs in a program.  
Design and create a maze-based challenge.

### Year 2:

Understand that algorithms are  
implemented as programs on digital  
devices.  
Understand that programs executed by  
following precise and unambiguous  
instructions.  
Create and debug simple programs.  
Use logical reasoning to predict the  
behaviour of own programs.

### Year 5:

Control a simple circuit connected to a computer.  
Write a program that includes count-controlled  
loops.  
Conclude that a loop can be used to repeatedly  
check whether a condition has been met  
Design a physical project that includes selection.  
Create a controllable system that includes  
selection.  
Design and create a program which uses  
selection.  
Evaluate my program.

### Year 6:

Define a 'variable' as something that is changeable.  
Choose how to improve a game by using variables.  
Design a project that builds on a given example.  
Use my design to create a project.  
Create a program to run on a controllable  
device.  
Update a variable with a user input.  
Design and develop a project that uses inputs and  
outputs on a controllable device.

## Year 7 (from main feeder school):

Sequence and Algorithm  
Apply selection  
Use Operators  
Use Count Controlled Iteration  
Problem Solve

# Computing: Creating Media 2

**EYFS (Barefoot Computing):**  
Compare and spot patterns.  
Play and work cooperatively.

**Year 1:**  
Label, group and compare objects  
on screen.

**Year 4:**  
Explain that data gathered over time can be used to answer questions.  
Use a digital device to collect data automatically.  
Explain that a data logger collects data points from sensors over time.  
Use data collected over a long duration to find information.  
Identify the data needed to answer questions.  
Use collected data to answer questions

**Year 3:**  
Create questions with yes/no answers.  
Identify the object attributes needed to collect relevant data.  
Create a branching database.  
Explain why it is helpful for a database to be well structured.  
Identify objects using a branching database.  
Compare information shown in a pictogram with a branching database.

**Year 2:**  
Use IT to enter data, present, sort  
and compare information.

**Year 5:**  
Use a form to record information.  
Compare paper and computer-based databases.  
Outline how grouping and then sorting data allows us to answer questions.  
Explain that tools can be used to select specific data.  
Explain that computer programs can be used to compare data visually.  
Apply knowledge of a database to ask and answer real-world questions.

**Year 6:**  
Identify questions which can be answered using data.  
Explain that objects can be described using data.  
Explain that formulas can be used to produce calculated data.  
Apply formulas to data, including duplicating.  
Create a spreadsheet to plan an event.  
Choose suitable ways to present data

**Year 7 (from main feeder school):**  
Understand how fonts, colours and images convey meaning.  
Understand the importance of resolution when selecting or printing an image.  
Learn how to use and manipulate layers to create a final image.  
Create and save a graphic in a format that preserves the layers.  
Understand how a bitmap graphic is made up of individual pixels.  
Understand that the number of bits per pixel determines the number of available colours for an image.  
Compare the different characteristics, strengths and uses of vector and bitmap images.  
Manipulate vector and bitmap images.

# Computing: Online Safety

**EYFS:**

**Year 1:**

Use technology safely, responsibly and respectfully.

Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

**Year 4:**

See individual online safety strands below.

**Year 3:**

See individual online safety strands below.

**Year 2:**

Use technology safely, responsibly and respectfully.

Know how to keep 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.

**Year 5:**

See individual online safety strands below.

**Year 6:**

See individual online safety strands below.

**Year 7 (from main feeder school):**

# Computing: Online Safety (self-image and identify)

## Year 3:

Explain what is meant by the term 'identity'.

Explain how people can represent themselves in different ways online.

Explain ways in which someone might change their identity depending on what they are doing online and why.

## Year 4:

Explain how my online identity can be different to my offline identity.

Describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.

Explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups, and explain why it is important to challenge and reject inappropriate representations online.

Describe issues online that could make anyone feel sad, worried, uncomfortable or frightened.  
Know and can give examples of how to get help, both on and offline.

Explain the importance of asking until getting the help needed.

## Year 5:

Explain how identity online can be copied, modified or altered.

Demonstrate how to make responsible choices about having an online identity, depending on context.

# Computing: Online Safety (online relationships)

## Year 3:

Describe ways people who have similar likes and interests can get together online.

Know & explain what it means to 'know someone' online and why this might be different from knowing someone offline.

Explain what is meant by 'trusting someone online', why this is different from 'liking someone online', and why it is important to be careful about who to trust online including what information and content they are trusted with.

Know & explain why someone may change their mind about trusting anyone with something if they feel nervous, uncomfortable or worried.

Know & explain how someone's feelings can be hurt by what is said or written online.

## Year 4:

Describe strategies for safe and fun experiences in a range of online social environments.

Give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.

Explain how content shared online may feel unimportant to one person but may be important to other people's thoughts feelings and beliefs.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Explain how sharing something online may have an impact either positively or negatively.

Describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and support if others do not.

Describe how things shared privately online can have unintended consequences for others.

Explain that taking or sharing inappropriate images of someone, even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.

## Year 5:

Give examples of technology-specific forms of communication.

Explain that there are some people who communicate online who may want to do me or my friends harm.

Recognise that this is not my / our fault.

Describe some of the ways people may be involved in online communities and describe how they might collaborate constructively with others and make positive contributions.

Explain how someone can get help if they are having problems and identify when to tell a trusted adult.

Demonstrate how to support others (including those who are having difficulties) online.



# Computing: Online Safety (online reputation)

## Year 3:

Explain how to search for information about others online.

Give examples of what anyone may or may not be willing to share about themselves online.

Explain the need to be careful before sharing anything personal.

Explain who someone can ask if they are unsure about putting something online.

## Year 4:

Describe how to find out information about others by searching online.

Explain ways that some of the information about anyone online could have been created, copied or shared by others.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Explain the ways in which anyone can develop a positive online reputation.

Explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity.

## Year 5:

Search for information about an individual online and summarise the information found.

Describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect.

# Computing: Online Safety (online bullying)

## Year 3:

Describe appropriate ways to behave towards other people online and why this is important.

Give examples of how bullying behaviour could appear online and how someone can get support.

## Year 4:

Recognise when someone is upset, hurt or angry online.

Describe ways people can be bullied through a range of media.

Explain why people need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation).

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Describe how to capture bullying content as evidence to share with others who can help me.

Explain how someone would report online bullying in different contexts.

## Year 5:

Recognise online bullying can be different to bullying in the physical world and can describe some of those differences.

Describe how what one person perceives as playful joking and teasing (including 'banter') might be experienced by others as bullying.

Explain how anyone can get help if they are being bullied online and identify when to tell a trusted adult.

Identify a range of ways to report concerns and access support both in school and at home about online bullying.

Explain how to block abusive users.

Describe the helpline services which can help people experiencing bullying, and how to access them.

# Computing: Online Safety (managing online information)

## Year 3:

- Demonstrate how to use key phrases in search engines to gather accurate information online.
- Explain what autocomplete is and how to choose the best suggestion.
- Explain how the internet can be used to sell and buy things.
- Explain the difference between a 'belief', an 'opinion' and a 'fact' and can give examples of how and where they might be shared online.

## Year 4:

- Analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others.
- Describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy.
- Describe some of the methods used to encourage people to buy things online (and can recognise some of these when they appear online).
- Explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true.
- Explain that technology can be designed to act like or impersonate living things and describe what the benefits and the risks might be.

## Year 7:

- Explain the need for the Data Protection Act.
- Recognise how human errors pose security risks to data.
- Define hacking in the context of cybersecurity.
- Explain how a DDoS attack can impact users of online services.
- Examine how different types of malware cause problems for computer systems

## Year 6:

- Describe how some online information can be opinion and can offer examples.
- Define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online.
- Understand the concept of persuasive design and how it can be used to influence peoples' choices.
- Describe how to analyse and evaluate the validity of 'facts' and information and explain why using these strategies are important.
- Describe the difference between online misinformation and dis-information.
- Identify, flag and report inappropriate content.

## Year 5:

- Explain the benefits and limitations of using different types of search technologies.
- Explain what is meant by 'being sceptical'; I can give examples of when and why it is important to be 'sceptical'.
- Evaluate digital content and can explain how to make choices about what is trustworthy.
- Identify ways the internet can draw us to information for different agendas.
- Describe ways of identifying when online content has been commercially sponsored or boosted.
- Describe how fake news may affect someone's emotions and behaviour and explain why this may be harmful.
- Explain what is meant by a 'hoax'.

# Computing: Online Safety (online bullying)

## Year 3:

Explain that not all opinions shared may be accepted as true or fair by others.

Describe and demonstrate how we can get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.

## Year 4:

Explain what is meant by fake news.  
Explain how using technology can be a distraction from other things, in both a positive and negative way.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Describe common systems that regulate age-related content and describe their purpose.

Recognise and discuss the pressures that technology can place on someone and how / when they could manage this.

Recognise features of persuasive design and how they are used to keep users engaged (current and future use).  
Assess and action different strategies to limit the impact of technology on health.

## Year 5:

Describe ways technology can affect health and well-being both positively.

Describe some strategies, tips or advice to promote health and wellbeing with regards to technology.

Recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals.  
Explain how and why some apps and games may request or take payment for additional content and explain the importance of seeking permission from a trusted adult before purchasing.

# Computing: Online Safety (privacy and security)

## Year 3:

Explain why spending too much time using technology can sometimes have a negative impact on anyone.

Explain why some online activities have age restrictions, why it is important to follow them and know who to talk to if others pressure them to watch or do something online that makes me feel uncomfortable.

Describe simple strategies for creating and keeping passwords private.

## Year 4:

Identify times or situations when someone may need to limit the amount of time they use technology.

Describe strategies for keeping personal information private, depending on context.

Explain that internet use is never fully private and is monitored, e.g. adult supervision.

Describe how some online services may seek consent to store information, knowing how to respond appropriately.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Describe effective ways people can manage passwords.

Explain what to do if a password is shared, lost or stolen.  
Describe how and why people should keep their software and apps up to date.

Describe simple ways to increase privacy on apps and services that provide privacy settings.

Describe ways in which some online content targets people to gain money or information illegally; Describe strategies to help me identify such content

Know that online services have terms and conditions that govern their use.

## Year 5:

Explain what a strong password is and demonstrate how to create one.

Explain how many free apps or services may read and share private information with others.

Explain what app permissions are and can give some examples.

# Computing: Online Safety (copyright and ownership)

## Year 3:

Give reasons why someone should only share information with people they choose to and can trust.

Describe how connected devices can collect and share anyone's information with others.

Explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.

## Year 4:

Know what the digital age of consent is and the impact this has on online services asking for consent.

When searching on the internet for content to use explain why I need to consider who owns it and whether I have the right to reuse it.

Give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images.

## Year 7:

Explain the need for the Data Protection Act.  
Recognise how human errors pose security risks to data.

Define hacking in the context of cybersecurity.  
Explain how a DDoS attack can impact users of online services.

Examine how different types of malware cause problems for computer systems

## Year 6:

Describe the use of search tools to find and access online content which can be reused by others.

Describe how to make references to and acknowledge sources I have used from the internet.

## Year 5:

Assess and justify when it is acceptable to use the work of others.

Give examples of content that is permitted to be reused and know how this content can be found online.