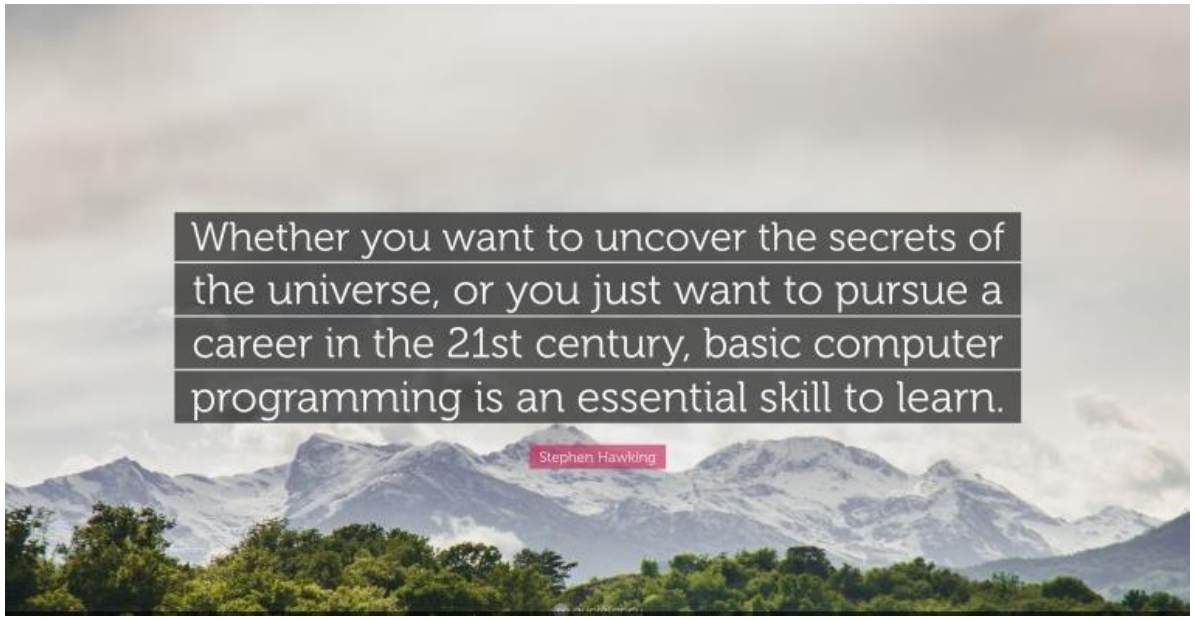

Whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn.
Stephen Hawking

COMPUTING

Computing Intent

Why do we teach computing?

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

What is the aim of our curriculum for computing?

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

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

Computing Intent

What do we teach in our computing curriculum?

Years 3 & 4

- Have an understanding of some of the risks of the digital world and how to keep themselves safe online
- Have experience of using a coding programme
- Be confident users of computing vocabulary
- Be able to create Word documents and PowerPoint presentations
- Understand how to search the internet safely and effectively
- Have experience of creating digital art and music digitally

Years 5 & 6

- Have an understanding of some of the risks of the digital world and how to keep themselves safe online
- Develop coding skills to create web pages and code hardware
- Use a range of programming languages
- To use Word, PowerPoint, Excel and to present information and support learning.
- Have experience of creating digital podcasts and music digitally
- Critically evaluate digital information

Computing Implementation

How is computing taught at Westende Junior School?

- At Westende Junior School, a specific scheme of work for the whole subject has not been chosen, to best meet the needs of our children by selecting from a range of resources (e.g. Espresso Discovery Education, Scratch, Lego WeDo, BBC Bitesize, MS Office). Where possible, links are made with other subject areas, so that computing is seen as a tool to support learning. For each of the four strands, one resource is the primary source for teaching materials to maintain a consistent approach throughout the school, but this may be supplemented where appropriate to provide a rich curriculum.

- Each lesson has a Skills, Knowledge or Understanding focus but these three strands are integrated across the Computing Curriculum. Many lessons require the children to access technology either individually, with a partner or in groups. For these lessons, the teacher acts as a facilitator, modelling the task and supporting where appropriate. However, not all lessons require technology. For example, when the focus is on teaching algorithms or for many online safety lessons, the teacher will lead the learning and impart knowledge.

Computing Content Spine

	Autumn	Spring	Summer
All Years	**E-Safety** National Online Safety programme covering: self-image and identity; online relationships; online reputation; online bullying; managing online information; health, wellbeing and lifestyle; privacy and security; copyright and ownership **1 lesson at the beginning of each half term.** Logging in to different programmes (e.g. Accelerated Reader and TTRS) and research skills – **Digital Literacy every term**		
Year 3	**Information Technology/Digital Literacy** Introduction to a computer and logging on to various websites Word Processing **Information Technology** Branching Databases	**Computer Science** Discovery Education: Coding Level 1 **Information Technology** Egyptians PowerPoint Presentations	**Computer Science** Discovery Education: Coding Level 2 **Information Technology** Digital Imagery – 3D Art
Year 4	**Information Technology** Communication and Collaboration **Information Technology** PowerPoint Presentations - STEM	**Information Technology** Word Processing **Computer Science** Discovery Education: Coding Level 3	**Computer Science** Discovery Education: Coding Level 4 **Information Technology** Digital Imagery – Animation
Year 5	**Information Technology** India PowerPoint Presentations **Computer Science** Discovery Education: Coding Level 5	**Computer Science** Discovery Education Coding: Level 6 **Computer Science** Scratch Coding	**Information Technology** Digital Sound - Audacity **Information Technology** Strategic Searching Online
Year 6	**Computer Science** Discovery HTML/Python **Information Technology** Digital Sound - Audacity	**Information Technology** Mayan PowerPoint presentations **Information Technology** Data handling – Excel spreadsheets	**Computer science** Scratch coding Lego We Do Animation – LegoLand Trip **Digital Literacy** Research skills

Computing Content Spine – Information Technology

	Year 3	Year 4	Year 5	Year 6
Information Technology	Word Processing – using a variety of functions Digital Media – using a variety of programmes to create artwork Branching databases – understand what data is and how it is stored Multimedia presentation – linked to Egyptians in history **Presentations** Open, locate and save a file. Add images and text boxes. Copy and paste images. Change text – font, colour and size. Change theme / background. Add new slides. Use present mode.	Word Processing – using a variety of functions Digital Media – using a variety of programmes to create animations Communication – understand the difference between online and offline communication and know how to send emails Multimedia presentation – linked to a STEM project **Presentations** Build on PowerPoint skills learnt in Year 3. Add animations. Add transitions between slides. Embed videos. Present with confidence. Add pre-recorded audio. Develop copying and pasting skills by using shortcut keys. Develop formatting skills by making text bold, underlining and using italics.	Digital Media – using audacity to record, manipulate and present sound in different ways Research - use search engines with increasing efficiency Multimedia presentation – linked to India in geography **Presentations** Build on PowerPoint skills learnt in Years 3 and 4. Add music and videos. Add presentation notes. Add timings to transitions. Insert hyperlinks. Present without reading off the slides. Develop copying and pasting skills by using the snipping tool.	Digital Media – using audacity to record, manipulate and present sound in different ways Data Handling – input and manipulate data on Excel Multimedia presentation – linked to India in history **Presentations** Build on PowerPoint skills learnt in Years 3, 4 and 5. Consider audience experience when presenting e.g. choice of music and the impact that this has on the audience. Explore different presentation software e.g. sway.

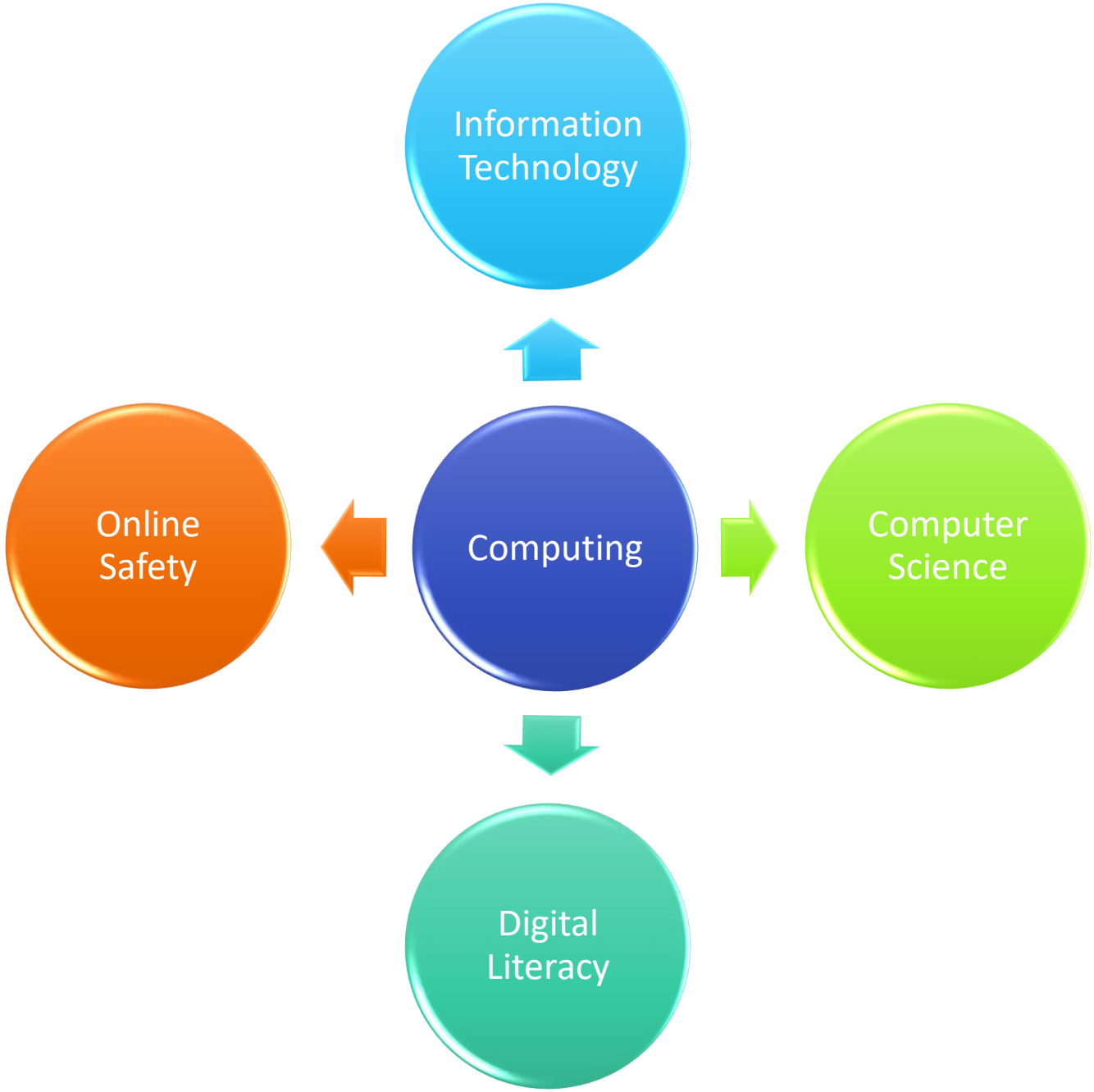
Computing Content Spine - Computer Science

	Year 3	Year 4	Year 5	Year 6
Computer Science	Discovery Coding, Level 1 - Programming a sprite to move - Simple inputs Discovery Coding, Level 2 - Different sorts of inputs - Buttons and instructions	Discovery Coding, Level 3 - Sequence and animation - Conditional Events Discovery Coding, Level 4 - Introduction to variables - Repetition and loops	Discovery Coding, Level 5 - Speed, direction and coordinates - Random numbers and simulations Discovery Coding, Level 6 - More complex variables - Object properties Scratch Coding - Applying the skills learnt in discovery coding levels 1 – 6 to a different software programme	Discovery Coding, HTML/Python - Creating interactive web pages - Applying the skills learnt in discovery coding levels 1 – 6 to a different software programme Scratch Coding - Applying the skills learnt in discovery coding levels 1 – 6 to a different software programme Lego Wedo: Write and debug code to accomplish a goal to simulate a physical system.

Computing Content Spine – Digital Literacy and Online Safety

	Year 3	Year 4	Year 5	Year 6
Digital Literacy	Create, save and locate digital documents. Use search engines effectively. Understand the reliability of online sources. Evaluate digital content. Work collaboratively on documents using cloud-based systems. Typing practise.	Create, save and locate digital documents. Use search engines effectively. Understand the reliability of online sources. Evaluate digital content. Work collaboratively on documents using cloud-based systems. Typing practise.	Create, save and locate digital documents. Use search engines effectively. Understand the reliability of online sources. Evaluate digital content. Work collaboratively on documents using cloud-based systems. Typing practise.	Create, save and locate digital documents. Use search engines effectively. Understand the reliability of online sources. Evaluate digital content. Work collaboratively on documents using cloud-based systems. Typing practise.
E-Safety	Familiarisation with School E-Safety Guidelines and what to do if faced with inappropriate content Introduction to safe search engines Intro to E-safety Exploring online Communication Devices Communicating online Personal Information Making a strong password and keeping passwords private	Re-familiarisation with School E-Safety Guidelines and what to do if faced with inappropriate content Re-Introduction to safe search engines Games and Apps Cyberbullying Online situations Being smart online To understand that we have a Digital Footprint	Re-familiarisation with School E-Safety Guidelines and what to do if faced with inappropriate content Re-Introduction to safe search engines and understand risks of accessing resources from the internet Introduction to E-Safety Social Media Cyber Bullying Online Communication Digital Footprints	Re-familiarisation with School E-Safety Guidelines and what to do if faced with inappropriate content Re-Introduction to safe search engines and understand risks of accessing resources from the internet Online scams Online Chatting Being online and Well Being - Online Behaviour Staying Safe online Understanding issues related to content sharing, permissions and copyright

Computing
Key Concepts



Computing Progression Map – Computer Science (Programming, coding and controlling devices)

3 & 4	Pupils will explore computer programming and computational thinking in different contexts – they will relate this to the world around them. The focus on algorithms (A set of instructions to solve a specific problem) at key stage 1 leads pupils into the design stage of programming. They use algorithms in the start of the process of creating working code, and identifying the steps needed to solve the different problems presented to them. Pupils should have opportunities to explain the thinking behind their algorithms, talking through the steps and explaining why they've solved a problem the way they have. They also need to be able to look at a simple programming project and explain what's going on and debug when it doesn't work. • Transfer skills to screen to program objects on screen using code – relevant to the given software • Explain code in a program and debug to improve or correct errors • Learn how to use variables in their code to change events e.g. changing the number of steps or size of angle and discuss consequences • Learn how to be more efficient with code using repeat and loop commands to achieve specific outcomes • Understand that objects can be controlled by other conditional inputs, "if the object hits a wall then.", "If object touches another object then ..." • Solve problems by decomposing code into smaller parts by using procedures
5 & 6	Pupils will explore computer programming and computational thinking in different contexts. They should have opportunities to explain the thinking behind their algorithms, talking through the steps and explaining why they've solved a problem the way they have. They also need to be able to look at a simple programming project and explain what's going on. • Undertake creative projects using procedures and variables to achieve specific outcomes to create a game or an App or control a specific device • Build a sequence of instructions **Algorithms** to control a device, create a simulation, an App or game considering the **inputs** and **outputs** • The code can draw upon their knowledge of **Sub-procedures,** Physical **inputs** and **outputs, Values**, including random numbers, ***If . . . then*** conditional commands, **Variables** • Explain the purpose and function of the **code** in the project • Compare and contrast different coding languages they use recognising similarities and differences

Computing Progression Map – Digital Literacy (Exploration)

3 & 4	• Pupils will find effective ways of searching for information on the Internet and consider personal safety • They will explore concepts such as where information and digital files are stored, who might create them and how search engines find information. They will understand not all information is correct and plausible • Familiarisation with digital content and storage systems (school network, Wi-Fi at school/home, cloud networks, internet, media storage) • Staying safe online • How to deal with inappropriate content • Storing and retrieving digital content in different contexts • Begin understanding search engine technologies and developing search techniques to refine searches for specific content
5 & 6	Pupils will explore finding information on the Internet efficiently and safely considering plausibility, bias and accuracy of information They will explore concepts such as where information and digital files are stored, who might create them, how they can find information in a safe and productive way. They will understand not all information is correct and use methods to check for bias, and plausibility • Understand the need for responsible use on all connected devices and know how to deal with content that upsets them or is inappropriate. • Storing and retrieving digital content in different contexts • Begin understanding search engine technologies and developing search techniques to refine searches for specific content • Evaluating and analysing information for plausibility, bias and accuracy of information • 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

Computing Progression Map – Digital Literacy (Communication and Collaborating)

3 & 4	In this strand the pupils will explore communication and collaboration tools. They will consider the online-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how contributions online are stored and how to be a responsible member of online communities. • Importance of keeping personal information private on the web • Use a wide range of tools to communicate and collaborate online in different curriculum contexts • Know the school online-safety policy and how to behave responsibly • How to respond to online issues e.g. cyber-bullying • Being a responsible member of a connected community
5 & 6	**In this strand** the pupils will explore communication and collaboration tools. They will consider the online-safety rules and how this keeps them safe at school but also consider them in a wider context. They will learn how contributions online are stored and how to be a responsible member of online communities. • Importance of keeping personal information private on the web • Use a wide range of tools to communicate and collaborate online in different curriculum contexts • Talk confidently about cyber-bullying and how to prevent and respond to it • Show an understanding of personal safety when using devices and the possible implications of misuse • Know the risks when communicating and publishing within and beyond the school • Understand that the internet has many features that can enable communication between groups beyond their school and be aware of the impact of their own contributions and online presence • Understand the implications of being a responsible member of a connected community

Computing Progression Map – Information Technology(Multimedia)

3 & 4	Pupils will create multimedia content in different curriculum contexts: • Communicate ideas using text, graphics and sound • Publish work collaboratively on a VLE/ learning platform for different audiences (also see the strand Communicating, Collaborating and Publishing) • Record and present information using a range of media for a particular audience • Be knowledgeable of the school's online-safety rules and adhere to them – in particular, when using the internet to find or link to resources • Consider good design features and specific layouts when creating media for print, multimedia or online presentation • Plan, design and style content for a presentation and combine a range of sources, considering the intended audience
5 & 6	Pupils will create multimedia content in different curriculum contexts: • Select an appropriate medium to communicate information choosing content and structure showing awareness of audience and purpose • Plan, design and style content for a presentation, combine a range of sources, images, text, sound, considering the intended audience • Use formatting, design and editing tools to present different styles of information • Publish work collaboratively on a VLE/ learning platform for different audiences (also see the strand Communicating, Collaborating and Publishing) • Be confident in all aspects of the school's online-safety rules and consider issues such as copyright and plagiarism when using resources from the internet – images and or sounds

Computing Progression Map – Information Technology (Digital Imagery)

3 & 4	Pupils will explore digital images in different contexts: • Use a range of graphics, paint packages to create different features and effects when creating different images • Use cameras and capture devices and import photo manipulation software to enhance mood or create different effects • Use animation and film creating and editing software to create as sequence to communicate a story or idea • They will also consider safe searching, copyright and privacy issues when sharing images with a wider audience
5 & 6	Pupils will explore digital images and moving images in different contexts: • They will use a range of graphics, paint packages, cameras and capture devices, photo manipulation software, animation and film creating and editing. • They will also consider safe searching, copyright and privacy issues when sharing images with a wider audience • Using a variety of tools and apps to create and manipulate an images • Selecting, using and combining a variety of software on a range of digital devices to design and create content that accomplish given goals • Choosing appropriate tools and techniques to create imagery for a specific task • Amending and combining digital images, animations and movies for a specific audience or task • Understand how images can be shared – understand who might see an image they have shared • Be able to talk about privacy in the context of digital imagery

Computing Progression Map – Information Technology (Music and Sound)

3 & 4	Pupils will explore and create music and sound in different contexts • Explore digital musical instruments and recording devices – they will know how their sounds are stored and played back through different media • Understand that their sound can be added to different software to create multimedia • Learn to use different software to create, edit and manipulate sounds (linked to animations)
5 & 6	Pupils will explore sound in different contexts • They will understand that their sound can be added to different software to create multimedia • They will learn to use different software to create, edit and manipulate sounds • They will learn how to save, retrieve, edit and share their compositions or podcasts

Computing Progression Map – Information Technology (Collecting, Analysing, Evaluating and Presenting Data)

3 & 4	Pupils will explore data in different contexts: • They will explore data manipulation in different contexts, they will use charting software and databases to collect and present their data to support science, geography, maths, DT, etc. They will use data loggers or apps on tablets to capture data. They will be introduced to simple spreadsheets to carry out calculations. • Represent data on screen using frequency charts, pictograms, bar charts and graphs for different purposes • Sort and search the data to answer specific questions • Use a variety of tools to collect data – data loggers, weather stations, apps on tablets, fitness related tools • Use the data collected to interpret, recognise patterns, describe events and answer questions • Consider the accuracy needed when collecting and storing data • Begin to develop knowledge about how data is used in the world around them how/where it is collected. They will also consider issues such as accuracy, privacy and keeping data safe
5 & 6	Pupils will explore data in different contexts: • They will use charting software and databases to collect and present their data to support other areas of the curriculum such as science, geography, maths, DT, etc. They will use data loggers or apps on tablets to capture data. They will be introduced to spreadsheets to solve specific problems. They will consider data in the wider context; what types of information are stored, how to keep data secure and private • Begin to develop knowledge about how data is used in the world around them how/where it is collected. They will also consider issues such as accuracy, privacy and keeping data safe. • Use spreadsheets to develop an understanding of simple functions and create a simple graphs and tables. • Use a variety of tools to collect data – data loggers, weather stations, apps on tablets, sport related tools • Use the data collected to interpret, recognise patterns, describe events and answer questions • Use databases to detect anomalies and inaccuracies and understand the need for accuracy when entering data • Understand that personal data is collected by others for a variety of purposes – understand the consequences of losing data or incorrect data • Use a spread sheet to write formulae to carry out calculations and use them to solve problems

Online-Safety at Westende

(Covered half termly in all year groups – resources in PiXL)

3 & 4	Pupils will explore: • Familiarisation with school online-Safety guidelines and what to do with inappropriate content • Introduction to safe search engines • To understand what online-safety means and to recognize when it is and isn't safe online • To identify online games and apps including the being able to recognize the dangers of online gaming and how to safe while playing online • To understand the different ways to communicate online and to understand the positive and negative effects of communicating online • Have an understanding of what cyber bullying is and how to identify incidents of cyber bullying and report to an adult • To understand how to safely communicate online and the importance of not sharing personal information to stay safe • To identify the different types of situation we may face when being online and how to deal with these situations • To understand that we have a digital footprint
5 & 6	Pupils will explore: • Re-familiarisation with the school online-Safety guidelines and what to do with inappropriate content • To understand the risks of accessing resources from the internet and how to stay SMART online • To recognize the features of spam and junk emails and to recognize some common online scams • To understand the positives and negatives uses of social media • To recognize that online friends may not be who they say they are and understand ways to chat safely and securely online • To understand what cyberbullying is, identify it and its consequences and learn how to deal with cyberbullying • To understand that screen use has become excessive and to understand the negative impact of too much time online • To understand how to show respect online and learn rules for how to conduct yourself online including how this is different to face to face communication • To understand what a digital footprint is and to explore what information is appropriate to put online including what to do when faced with a digital dilemma • To learn about ways to manage your privacy and reputation online. • To identify how to make good choices about sharing contact online