



Progression Framework
Computing
Year Three

Progression Framework for Computing, Year Three

Domain: Computer Science

Lower Key Stage Two

Year Three

Sub-strand	Progression statement	What to look for guidance (working towards expectation)	What to look for guidance (Meeting expectation)	What to look for guidance (Exceeding expectation)
Problem solving	C.3.1.1. Design, write and debug programs that accomplish specific goals.	<p>The child can design and implement some aspects of a program using a block language, which can run automatically without user interaction.</p> <p>A typical program might be an animation to tell a joke or part of a story, or perhaps be linked to a curriculum topic studied by the children. The program could use movement and on-screen dialogue. Do not expect children at this level to control interaction between two sprites.</p> <p><i>(E.g. In 3.1 make progress towards creating an animation in Scratch.)</i></p>	<p>The child can design and write a program using a block language, without user interaction.</p> <p>A typical program might be a scripted animation for a joke, part of a story, or linked to another area of the curriculum. Programs could use pre-built sprites or ones designed by the child. Expect programs to include movement and dialogue; they may also include sound effects and some use of costumes to allow for animated movement. There may be more than one sprite in the animation.</p> <p><i>(E.g. In 3.1, create an animation in Scratch.)</i></p>	<p>The child can design, write and debug a program using a block language, without user interaction.</p> <p>At this level, expect the child to have successfully debugged their animation programs, which would typically include movement, on-screen dialogue, sound, costume changes and multiple sprites. Animations could be linked to curriculum topics, or simply tell jokes or a story. The child should be able to explain what bugs they found and how they fixed these.</p> <p><i>(E.g. In 3.1, create an animation in Scratch, independently debugging any errors they encounter. In 3.2, debug the Scratch programs given.)</i></p>
	C.3.1.2. Controlling or simulating physical systems.	<p>The child can understand that physical systems can be simulated on screen.</p> <p>The child can identify where a physical system has been simulated on screen, e.g. a ball bouncing on a bat or a car moving around a track. Simulations may be linked to topics in other curriculum areas, including science. Computer games often include simulations of physical systems; the child should be able to identify when this is the case.</p> <p><i>(E.g. In 3.2, use the tennis and racing car simulator programs.)</i></p>	<p>The child can explore simulations of physical systems on screen.</p> <p>The child can experiment with some on-screen simulations of physical systems, perhaps linked to topics from other curriculum areas, e.g. a ball bouncing on a bat or a car moving around a track. Many computer games include elements of computer simulations. The child can discuss what they have learned from using the simulation.</p> <p><i>(E.g. In 3.2, explore the tennis and racing car simulator programs.)</i></p>	<p>The child can develop their own simulations of a simple physical system on screen.</p> <p>The child can develop simulations of simple physical systems, e.g. a simple tennis game or a racing car moving around a track. Do not expect the child to have a full understanding of underlying physics. The child can discuss the limitations of their simulation.</p> <p><i>(E.g. In 3.1, create an animation of a physical system. In 3.2, fix the tennis and racing car programs.)</i></p>

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	<p>C.3.1.3. Solve problems by decomposing them into smaller parts</p>	<p>The child can identify parts of a project.</p> <p>When working on a project, such as an animation, a video or a survey, the child can identify the different stages of the project and/or the resources they will need for their project. In video work, parts of a project might include identifying a subject; storyboarding the video; sourcing media; recording video; filming; editing; exporting.</p> <p><i>(E.g. In 3.1, consider the different elements of an animation project. In 3.3, consider the different parts of a video project. In 3.6, consider the different parts of an online survey-based project.)</i></p>	<p>The child can plan a project.</p> <p>Working with the teacher and, perhaps, other children, the child can develop an outline plan for a project in computing, involving multiple steps and resources, e.g. creating an animation, filming a video or conducting a survey. In video work, the plan might include identifying a subject; storyboarding the video; sourcing media; recording video; filming; editing; exporting.</p> <p><i>(E.g. In 3.1, plan an animation project. In 3.3, plan their video project. In 3.6, plan their online survey-based project.)</i></p>	<p>The child can work with others to complete a project.</p> <p>In working on a project, such as an animation, a video or a survey, the child can contribute effectively to a team to accomplish the main project outcomes. In video work, the child could work with others to identify a subject; storyboard the video; source media; record video; film, edit and export.</p> <p><i>(E.g. In 3.1, work with others to complete their animation project. In 3.3, work with others to complete their video project. In 3.6, work with others to complete their online surveybased project.)</i></p>
<p>Programming</p>	<p>C.3.2.1. Use sequence, selection and repetition in programs; work with variables.</p>	<p>The child can understand that programs include sequences of instructions.</p> <p>The child can understand that programs are made up of sequences of instructions (ideally in code they have created themselves, but possibly that of their peers or programs they have been provided with). A typical program could be a scripted animation using movement and onscreen text. The child can look at a program on screen and list some of the instructions it includes.</p> <p><i>(E.g. In 3.1 and 3.2, notice that programs are made of sequences of instructions.)</i></p>	<p>The child can use sequence in programs.</p> <p>In on-screen programming, the child's program should include a sequence of commands or blocks in an appropriate order. A typical program could be a simple scripted animation, e.g. telling a joke, a story or explaining an idea taken from elsewhere on the curriculum. The child's program might include multiple sprites; instructions could include movement, on-screen text, sound and/or costume changes.</p> <p><i>(E.g. In 3.1, use sequences of instructions in their Scratch animation program.)</i></p>	<p>The child can use sequence and repetition in programs.</p> <p>In on-screen programming, the child can include sequences of commands or blocks. The child can include some repeating loops, typically using a 'forever' or 'while true' construction, or repetition for a fixed number of times. Programs could include simple animations (e.g. telling a joke, a story or explaining an idea taken from elsewhere on the curriculum) but could also include music as a sequence of steps to play notes or drawing as a sequence of steps to draw a shape.</p> <p><i>(E.g. In 3.1, use sequence and repetition in their animation program. In 3.2, debug programs using sequence and repetition.)</i></p>
	<p>C.3.2.2. Work with various forms of input and output</p>	<p>The child can understand that computers accept input and produce output.</p> <p>The child can identify the most common forms of input (e.g. keyboard and mouse/trackpad or touch screen) and output (screen and speakers) for a computer. The child can distinguish between input and output.</p>	<p>The child can write a program to produce output on screen.</p> <p>The child can create a program that produces output on screen, such as moving sprites or displayed text, e.g. a simple animation program.</p>	<p>The child can write a program to produce output on screen and through speakers/headphones.</p> <p>The child can write a program that produces output on screen (e.g. displayed text and moving sprites in a simple animation) as well as some sound (e.g. recorded audio, computer-generated music or sound effects for an animation program).</p>

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		<i>(E.g. In 3.2, notice that many of these programs accept input as well as producing output. In 3.3 and 3.6, recognise input and output.)</i>	<i>(E.g. In 3.1, create a simple animation program in Scratch.)</i>	<i>(E.g. In 3.1, create an animation program in Scratch that includes some sound effects or recorded voices.)</i>
Logical Thinking	C.3.3.1. Use logical reasoning to explain how some simple algorithms work.	<p>The child can predict what an algorithm will do.</p> <p>The child can explain what will happen when their algorithm is implemented as a program on a computer or when its instructions or rules are followed.</p> <p><i>(E.g. In 3.1, use their storyboard to predict what happens next.)</i></p>	<p>The child can explain a simple, sequencebased algorithm in their own words.</p> <p>The child can give an explanation for a simple algorithm based on a sequence of instructions. The algorithm could be one of their own, or a simple one with which they have been provided. The algorithms could be recorded graphically, e.g. as a storyboard.</p> <p><i>(E.g. In 3.1, explain the idea for their animation in their own words. In 3.3, explain the idea for their video in their own words.)</i></p>	<p>The child can explain an algorithm using sequence and repetition in their own words.</p> <p>The child can give an explanation for a simple algorithm based on a sequence of instructions with some repetition (either 'forever' or for a fixed number of times). The algorithm could be one of their own, or a simple one with which they have been provided. The algorithms could be recorded graphically, such as a storyboard, or in other forms, such as staff notation.</p> <p><i>(E.g. In 3.1, explain the idea for their animation in their own words, discussing how they have used repetition in this.)</i></p>
	C.3.3.2. Use logical reasoning to detect and correct errors in algorithms and programs.	<p>The child can spot errors in programs.</p> <p>When running a program, the child can identify that there is an error and can describe what went wrong. The programs can be the child's own or ones provided for them.</p> <p><i>(E.g. In 3.1, spot bugs in their animation. In 3.2, spot bugs in the programs provided.)</i></p>	<p>The child can use logical reasoning to detect errors in programs.</p> <p>The child can give well-thought-through reasons for errors they find in programs. Typically, the child can find errors by reasoning logically about the program code, but they might also be able to use logical reasoning to identify errors in programs when they are executed. The programs do not have to be written originally by the child.</p> <p><i>(E.g. In 3.1, use logical reasoning to spot bugs in their animation. In 3.2, use logical reasoning to spot the bugs in the programs provided.)</i></p>	<p>The child can use logical reasoning to detect and correct errors in programs.</p> <p>The child can give well-thought-through reasons for errors they find in programs and explain how they have fixed these. The child can find and correct errors by reasoning logically about the program code, but they might also be able to use logical reasoning to identify errors in programs when executed and confirm that they have fixed these by testing the new version of their program. The programs do not have to be written originally by the child.</p> <p><i>(E.g. In 3.1, spot and correct errors in their animation using logical reasoning. In 3.2, use logical reasoning to detect and correct errors in the provided programs.)</i></p>
	C.3.3.3. Understand computer networks including the internet.	<p>The child can understand that computer networks transmit information.</p> <p>The child can understand that information of many different sorts can be transmitted through computer networks including the</p>	<p>The child can understand that computer networks transmit information in a digital (binary) format.</p> <p>The child can explain that any information has to be converted to numbers before it can travel through computer networks. The child should understand that this conversion</p>	<p>The child can understand some ways in which information can be converted into a binary code.</p> <p>The child can explain that any information has to be converted to numbers before it can travel through computer networks; these numbers are represented as binary (on/off or high/low) signals. The child should understand that this conversion happens according to</p>

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		<p>internet. The child will understand that this is (generally) fast and reliable.</p> <p><i>(E.g. In 3.4, recognise that information is communicated through the internet. In 3.5, understand that email and videoconferencing also take place via the internet.)</i></p>	<p>happens according to an agreed system or code.</p> <p><i>(E.g. In 3.4, recognise that information is communicated through the internet in a binary code. In 3.5, understand that email and videoconferencing also take place through transmitting binary information.)</i></p>	<p>an agreed system or code, and that a number of different systems are, or have been, used, e.g. Morse and unicode for text, bitmaps for images, pulse code modulation (PCM) encoding of audio.</p> <p><i>(E.g. In 3.4 and 3.5, think of ways in which information can be converted to a binary code.)</i></p>
	<p>C.3.4.1. Understand how networks can provide multiple services, such as the world wide web.</p>	<p>C.3.4.2. The child can understand that email works through the internet.</p> <p>The child can explain that email is sent and received via servers connected to the internet.</p> <p><i>(E.g. In 3.5, understand that emails are routed via the internet.)</i></p>	<p>C.3.4.3. The child can understand that email and videoconferencing are made possible through the internet.</p> <p>The child should know that email messages are sent and received through servers connected to the internet. The child should know that Skype and other videoconferencing systems also work through the internet, but these services may be direct, peer-to-peer connections rather than via servers.</p> <p><i>(E.g. In 3.5, understand that emails and videoconferencing are routed via the internet.)</i></p>	<p>C.3.4.4. The child can understand that the internet can provide a number of services in addition to the web.</p> <p>The child should demonstrate an understanding that the internet plays host to a range of different services including, e.g. the web, email, videoconferencing, online gaming, file sharing and instant messaging.</p> <p><i>(E.g. In 3.4 and 3.5, understand that services such as ping, traceroute, nslookup, email and videoconferencing all function via the internet.)</i></p>

Progression Framework for Computing, Year Three

Domain: Digital Literacy
Lower Key Stage Two
Year Three

Sub-strand	Progression statement	What to look for guidance (working towards expectation)	What to look for guidance (Meeting expectation)	What to look for guidance (Exceeding expectation)
E-Safety	C.3.1.1. Use technology safely, respectfully and responsibly.	<p>The child can use digital technology safely.</p> <p>The child should know that they need to keep themselves safe when using digital technology. E.g. They should take care when using the Command prompt and should treat attachments and links in emails with caution.</p> <p><i>(E.g. In 3.4, use the Command prompt with care. In 3.5, take care with links and attachments in email; respond appropriately to others.)</i></p>	<p>The child can use digital technology safely and show respect for others when working online.</p> <p>The child should know that they need to keep themselves safe when using digital technology. E.g. They should show respect for others when filming and should not normally post videos online. They should take care when using the Command prompt and should treat links and attachments in emails with caution. If responding to online surveys, they should do so anonymously, thinking carefully about information they give out.</p> <p><i>(E.g. In 3.3, take care to film appropriately and not publish video of other children. In 3.4, use the Command prompt with care. In 3.5, take care with links and attachments in email. In 3.6, ensure questions are answered anonymously.)</i></p>	<p>The child can demonstrate that they can act responsibly when using computers.</p> <p>The child can demonstrate that they act responsibly when using computers. E.g. They should contribute positively to online communities, if allowed to do so, observing the terms and conditions. They should take care when filming others and should not post videos of others online. They should treat links and attachments in emails with caution. If responding to online surveys, they should do so anonymously, thinking carefully about information they give out.</p> <p><i>(E.g. In 3.1 and 3.2, contribute positively to the Scratch community, if allowed to do so. In 3.3, take care to film appropriately and not publish video of other children. In 3.4, use the Command prompt with care. In 3.5, take care with links and attachments in email. In 3.6, ensure questions are answered anonymously.)</i></p>
	C.3.1.2. Recognise acceptable/unacceptable behaviour.	<p>The child can give examples of things that they should or should not do when using digital technology.</p> <p>The child can give some examples of things they should or should not do when using digital technology in a range of contexts. Contexts could include the Scratch website, or other online communities; using the Command prompt; using email; filming or sharing video; using online survey tools.</p>	<p>The child can recognise unacceptable behaviour when using digital technology.</p> <p>The child can identify what would be unacceptable or inappropriate behaviour when using digital technology in a range of contexts.</p> <p>E.g. They should know what would be unacceptable when using online communities, such as the Scratch website, or when shooting or publishing video. They should know what</p>	<p>The child can understand the difference between acceptable and unacceptable behaviour when using digital technology.</p> <p>The child can discuss the difference between acceptable and unacceptable behaviour when using digital technology in a range of contexts. Contexts could include the Scratch website, or other online communities; using the Command prompt; using email; filming or sharing video; using online survey tools.</p>

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		<p><i>(E.g. In 3.3, give examples of good or bad practice when shooting or publishing video. In 3.4, give examples of good or bad practice when using the Command prompt. In 3.5, give examples of good or bad practice when using email. In 3.6, give examples of good or bad practice when creating or completing online surveys.)</i></p>	<p>would be unacceptable use of the Command prompt, email or online survey tools.</p> <p><i>(E.g. In 3.1 and 3.2, recognise unacceptable behaviour when using the Scratch community. In 3.3, recognise unacceptable behaviour when shooting or publishing video. In 3.4, recognise unacceptable behaviour when using the Command prompt. In 3.5, recognise unacceptable behaviour when using email. In 3.6, recognise unacceptable behaviour when creating or completing online surveys.)</i></p>	<p><i>(E.g. In 3.1 and 3.2, understand the difference between acceptable and unacceptable behaviour when using the the Scratch community. In 3.3, understand the difference between acceptable and unacceptable behaviour when shooting or publishing video. In 3.4, understand the difference between acceptable and unacceptable behaviour when using the Command prompt. In 3.5, understand the difference between acceptable and unacceptable behaviour when using email. In 3.6, understand the difference between acceptable and unacceptable behaviour when creating or completing online surveys.)</i></p>
	C.3.1.3. Know a range of ways to report concerns and inappropriate behaviour.	<p>Know who to talk to about inappropriate behaviour in school. Pupils should know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult.</p> <p><i>(E.g. Know to tell a teacher about inappropriate behaviour in units 3.3, 3.4, 3.5 and 3.6.)</i></p>	<p>Know who to talk to about concerns and inappropriate behaviour in school.</p> <p>Pupils should know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult, and that they can discuss any concerns they have with their teacher or other trusted adults in school.</p> <p><i>(E.g. Know to tell a teacher about any concerns or inappropriate behaviour in any units.)</i></p>	<p>Know who to talk to about concerns and inappropriate behaviour at home or in school.</p> <p>Pupils should know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult, and that they can discuss any concerns they have with their teacher or other trusted adults in school. They should also know that any concerns over inappropriate behaviour with digital technology at home can be discussed with their parents, with you or with another trusted adult. Pupils might also know that they can report inappropriate behaviour to those running websites, to ChildLine, to CEOP or to the police.</p> <p><i>(E.g. Know to tell a teacher about any concerns or inappropriate behaviour in any units. Know that concerns in relation to the Scratch community can be reported to the community moderators (units 3.1 and 3.2). Know that they should talk to their parents about concerns and inappropriate behaviour outside school.)</i></p>
	C.3.1.4. Be discerning in evaluating digital content.	<p>The child can make choices about which web page they consider most useful.</p> <p>When given a list of web pages, the child can decide which they think will be most useful for their purpose or to answer a question they have.</p>	<p>The child can decide whether a web page is relevant for a given purpose or question.</p> <p>The child can form a judgement about whether a web page is appropriate for finding out the answer to a question they have or for a given purpose.</p>	<p>The child can decide whether digital content is relevant for a given purpose or question.</p> <p>The child can form a judgement about whether a web page or other digital content is appropriate for finding out the answer to a question they have or for a given purpose.</p>

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				<i>(E.g. In 3.1, 3.3 and 3.6, carefully consider whether their work is well suited to its intended purpose.)</i>
	C.3.1.5. Understand the opportunities networks offer for communication and collaboration.	<p>The child can use email to communicate with a classmate.</p> <p>The child can email to communicate effectively with a classmate. This will typically be part of a whole-class activity.</p> <p><i>(E.g. In 3.5, use email to communicate.)</i></p>	<p>The child can use email and videoconferencing in class.</p> <p>When working as part of the class, the child can use email effectively and participate in a whole-class videoconference.</p> <p><i>(E.g. In 3.5, use both email and videoconferencing to communicate.)</i></p>	<p>The child can use email and videoconferencing effectively for a given purpose.</p> <p>When working as part of the class and with a given purpose, the child can use email effectively and actively participate in a whole-class videoconference.</p> <p><i>(E.g. In 3.5, use email and videoconferencing effectively for the given purpose.)</i></p>

Progression Framework for Computing, Year Three

Domain: Information Technology

Lower Key Stage Two

Year Three

Sub-strand	Progression statement	What to look for guidance (working towards expectation)	What to look for guidance (Meeting expectation)	What to look for guidance (Exceeding expectation)
Creating Content	C.3.1.1. Select, use and combine a variety of software (including internet services) on a range of digital devices.	<p>The child can use some simple programs on a computer.</p> <p>The child can use a range of software on laptop or tablet computers, with support when necessary. Software might include video editing, email clients, videoconferencing (with the teacher or another adult), survey design software and spreadsheets.</p> <p><i>(E.g. Use Movie Maker in 3.3, use the Command prompt in 3.4, use Outlook or webmail and Skype in 3.5, use Google Forms and Google Sheets in 3.6.)</i></p>	<p>The child can use a range of programs on a computer.</p> <p>The child can use a range of software on laptop or tablet computers with some degree of independence. Software might include video editing, diagnostic tools, email clients, videoconferencing (with the teacher or another adult), survey design software, spreadsheets and presentation software.</p> <p><i>(E.g. Use Movie Maker in 3.3, use the Command prompt and network program in 3.4, use Outlook or webmail and Skype in 3.5, use Google Forms, Google Sheets and Google Slides in 3.6.)</i></p>	<p>The child can use and combine a range of programs on a computer.</p> <p>The child can use multiple programs on laptop or tablet computers to achieve particular goals. E.g. They might create a presentation and then email this to a classmate; create a survey using a survey design application, analyse the results in a spreadsheet and then make a presentation about their findings.</p> <p><i>(E.g. In 3.5, combine email and presentation software. In 3.6, combine Google Forms, Google Sheets and Google Slides.)</i></p>
	C.3.1.2. Design and create a range of programs, systems and content that accomplish given goals.	<p>The child can create content on a computer.</p> <p>The child can use software on a laptop or tablet to create digital content, with support if necessary. E.g. They could shoot a video, create a presentation on a given topic or create an online survey.</p> <p><i>(E.g. In 3.3, shoot video. In 3.5, compose emails and create a presentation. In 3.6, write survey questions and create a presentation.)</i></p>	<p>The child can design and create content on a computer.</p> <p>The child can plan and execute a project in which they use software on a laptop or tablet to create digital content with some degree of independence. E.g. They could plan and shoot a video, plan and create a presentation on a given topic or plan and then create an online survey.</p> <p><i>(E.g. In 3.3, plan and shoot video. In 3.5, plan and create a presentation. In 3.6, plan and then write survey questions, and plan and create a presentation.)</i></p>	<p>The child can design and create content on a computer in response to a given goal.</p> <p>With a given goal, the child can plan and execute a project in which they use software on a laptop or tablet to create digital content with some degree of independence. E.g. They could plan and shoot a video, plan and create a presentation on a given topic or plan and then create an online survey. They should evaluate how effectively they have met the requirements of the original goal.</p> <p><i>(E.g. In 3.3, plan and shoot video for a given goal. In 3.5, plan and create a presentation for a given goal. In 3.6, plan and then write survey questions, and plan and create a presentation for a given research topic.)</i></p>

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	C.3.1.3. Collecting, analysing, evaluating and presenting data and information.	<p>The child can collect information.</p> <p>The child can use computers to collect or access information. E.g. They could shoot a video, read an email or conduct an online survey. They should be able to do this with appropriate support, if necessary.</p> <p><i>(E.g. In 3.3, shoot video. In 3.5, read emails. In 3.6, read answers to survey questions.)</i></p>	<p>The child can collect and present information.</p> <p>The child can use computers to collect information and present this to an audience. E.g. They could shoot and then show a video, read and respond to an email or conduct an online survey and present the results. They should be able to do this with a degree of independence.</p> <p><i>(E.g. In 3.3, shoot and then show video. In 3.5, read and respond to email. In 3.6, collect and present survey results.)</i></p>	<p>The child can collect, evaluate and present information.</p> <p>The child can use computers to collect and evaluate information and present this to an audience. E.g. They could shoot, review and then show a video; read, consider and respond to an email or conduct an online survey, evaluate or summarise the results and present these. They should be able to do this independently for the most part.</p> <p><i>(E.g. In 3.3, shoot, review and then show video. In 3.6, collect, review and present survey results.)</i></p>
Searching	C.3.2.1. Use search technologies effectively.	<p>The child can search for information on a web page.</p> <p>The child can use skimming and scanning strategies, and their web browser's Find command, to find specific information on a web page.</p>	<p>The child can search for information within a single site.</p> <p>The child can use browser-specific tools (e.g. the Find command) and site-specific tools (such as the search tools for Wikipedia or YouTube) to locate particular information on a web page or within a website.</p>	<p>The child can use a standard search engine to find information.</p> <p>The child can use a common search engine (such as Google with safe search mode locked in place) effectively to search for particular information on the web.</p>
	C.3.2.2. Appreciate how search results are selected and ranked.	<p>The child can understand that search engines make it easier to find content online.</p> <p>The child can use at least one search engine to find appropriate online content. The child should consider how much harder it would be to find online content without a search engine.</p>	<p>The child can understand that search engines select pages according to keywords found in the content.</p> <p>When using search engines, the child should demonstrate their understanding that the pages shown include the keywords they have specified. The child can use this knowledge by thinking of good keywords appropriate for what they are searching.</p>	<p>The child can understand that search engines rank pages according to relevance.</p> <p>The child can demonstrate their understanding that search engine results are ranked according to relevance, and that normally the top results on the first page are likely to be those most relevant to their query. If the child is unable to find good results on the first page, expect them to reconsider their keywords rather than looking at further pages of results.</p>