Computing in Year 5

Topics: Systems and Searching, Video Production, Selection in Physical Computing, Flat-File Database, Introduction to Vector Graphics, Selection in Quizzes

Systems and Searching

National Curriculum Statements:
- 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.
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
- Use technology safely, respectfully and responsibly; recognise acceptable and unacceptable behaviour, identify a range of ways to report concerns about content and contact.

Knowledge:
- Explain how computers can be connected together to form systems.
- Recognise the role of computer systems in our lives.
- Identify how to use search engines and describe how search engines can select results.
- Explain how search results are ranked and recognise why the order of results is important and to whom.

Implementing Skills:
- Investigate how components work together to perform a task. Explore how digital systems can work and learn about physical and electronic connections. Reflect on how computer systems can help them.
- Use a web search to find specific information and refine the web search to get the best results. Investigate carrying out searches using a search engine and the address bar. Compare results from different search engines.
- Break down in detail the steps needed to find things on the web and use this to create an index of their own classroom.
- Create paper-based web pages on a familiar topic and discover how their webpages would rank when searching for keywords relating to their content.
- Explore some of the limitations of searching and discuss what can be searched.

Assessment:
- Can children explain that computers can be connected to form systems and recognise the role of computer systems in our lives?
- Can children experiment with search engines and describe how search engines select results?
- Are children able to explain how search results are ranked and recognise why the order of results is important and to whom?

Video Production

National Curriculum Statements:
- Use search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable and unacceptable behaviour, identify a range of ways to report concerns about content and contact

Knowledge:
- Know what makes a video effective.
- Know how to use a digital device to record video and how to capture video using a range of techniques.
- Know how to create an effective storyboard to plan a video.
- Know how to edit a video and how to share.

Implementing Skills:
- Explore different features of videos and video effects.
- Plan a video by creating a storyboard including script, camera angles and filming techniques.
- Create their video then import their content to video editing software deciding whether sections of their video can be edited or need to be shot again.
- Explore how and if they share their videos with others.

Assessment:
- Can children explain what makes a video effective and identify digital devices that can record video?
- Can children create a storyboard?
- Can children capture video using a range of techniques and identify that video can be improved through reshooting & editing?

Selection in Physical Computing

National Curriculum Statements:
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems, solve problems by decomposing them into smaller parts
- Use sequence, selection and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and connect errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Knowledge:
- Know how to control a simple circuit connected to a computer.
- Know how to write a program that includes count-controlled loops.
- Know that a loop can stop when a condition is met, explain that a loop can be used to repeatedly check whether a condition has been met and use that to design a conditional loop.
- Identify how selection might be used in real-world situations and use this knowledge to design their own project.
- Know how to create and use an algorithm and be able to debug any issues.

Implementing Skills:
- Connect a Sparkle to a Crumble and then program the Crumble to make the Sparkle flash different colour patterns using infinite loops.
- Connect a Sparkle and a motor to the Crumble controller then design sequences of actions by applying their knowledge of repetition using count-controlled loops.
- Identify conditions in statements stating if they are true or false. Use a Crumble switch to explore how to write programs that use an input as a condition.
- Explore how the flow of actions in algorithms and programs can be controlled by conditions and be introduced to selection and then represent conditions and actions using the 'if…then…' structure. Create algorithms that include selection and use these algorithms to guide their program writing.
- Develop Crumble programs to control a model e.g. fairground ride.

Assessment:
- Control a simple circuit connected to a computer and write a program that includes count-controlled loops?
- Explain that a loop can stop when a condition is met and explain that a loop can be used to repeatedly check whether a condition has been met?
- Design a physical project that includes a selection and create a program that controls a physical computing project?

Flat File Database

National Curriculum Statements:
- Use search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Knowledge:
- Know how to create a database using cards and how to use it to sort, order and group data.
- Comparing paper and computer-based databases and identify which field to sort data by to answer a given question.
- Describe how to answer questions by grouping and then sorting data using a computer-based database and know which tools can be used to select specific data.
- Explain that computer programs can be used to compare data visually

Implementing Skills:
- Create a paper version of a record card database. Using a card template, create a data set creating 8 to 10 cards linked to a theme e.g. animals.
- Use a computer-based database to examine how data can be recorded and viewed then order records in different ways and compare this database to a paper database.
- Using both paper records and computer-based databases, use 'grouping' and 'sorting' to answer questions about data.
- Use advanced search techniques to answer questions about data and to search for more than one field.
- Create charts from their own data in order to answer questions about it.
- Use a real-life database to ask questions and find answers in the context of a flight search based on set parameters.

Assessment:
- Can they use a form to record information and compare paper & computer-based databases?
- Can they outline how you can answer questions by grouping & then sorting data and explain that tools can be used to select specific data?
- Can they explain that computer programs can be used to compare data visually and use a real-world database to answer questions?

Introduction to Vector Graphics

National Curriculum Statements:
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Knowledge:
- Understand that different tools can be used to produce different outcomes in vector drawings.
- Know how to create a vector drawing using shape and line tools.
- Identify the shapes that are used to make vector drawings and explain that each element of a vector drawing is called an object.
- Know which tools to use to create a desired effect and recognise that vector drawings consist of layers.

Implementing Skills:
- Use shape tools to create their own vector drawings and discuss how there differ from paper-based drawings.
- Create their own vector drawing by moving, resizing, rotating and changing the colours of a selection of objects. Learn how to duplicate objects.

- Increase the complexity of vector drawings using the zoom tool to add detail. Also use tools to modify objects to create a new image.
- Explore how to group multiple objects and use this knowledge to group and ungroup objects in order to make changes to and develop their vector drawings.
- Create a vector drawing for a specific purpose.

Assessment:
- Can they identify that drawing tools can be used to produce different outcomes and use tools to achieve a desired effect?
- Can they create a vector drawing by combining shapes and recognise that drawings consist of layers and group objects to make it easier to work with?
- Can they apply what they have learned about vector drawings?

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Selection in Quizzes

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National Curriculum Statements:
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems, solve problems by decomposing them into smaller parts.
- Use sequence, selection and repetition in programs, work with variables and various forms of input and output.
- Use logical reasoning to explain how some simple algorithms work and to detect and connect errors in algorithms and programs.
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Knowledge:
- Know how selection is used in computer programs and how selection describes the flow of a program.
- Relate that a conditional statement connects a condition to an outcome.
- Use their knowledge of selection to design and create a program.

Implementing Skills:
- Identify how 'conditions' are used to control the flow of actions in a program. In Scratch use blocks for using conditions in programs and modify the conditions in an existing program.
- Develop understanding of selection by using 'if…then…else…' structure in algorithms and programs. Write their own program that use selection with 2 outcomes.
- Use 'if….then…else' to identify 2 responses to a binary question. Use algorithm to design a program that uses selection to direct the flow of the program based on the answer provided.
- Use selection to control the outcomes in an interactive quiz and use an algorithm to show how they will use selection in the quiz to control the outcomes based on the answer given.
- Identify how to debug their program, consider the value of sharing their program and evaluate the success of their program.

Assessment:
- Can they explain how selection is used in computer programs and explain how selection directs the flow of a program?
- Can they relate that a conditional statement connects a condition to an outcome?
- Can they design & create a program which uses selection and evaluate the program?