Alexandra Park Junior School

Computing at Alexandra Park Junior School – July 24

Curriculum Offer

Stage 1 - Quality First Teaching. Every child receives at least:

- Each Class taught one Computing Lesson a Week.
- Each year group is taught 6 units from different Computing Strands from Year 3 and Year 6.

- The Computing Strands Covered are:
  - Computer Science
  - Digital Literacy
  - Information Technology

- These are then broken down into the following sub-strands:
  - Technology in our lives
  - Coding and Programming
  - Multimedia, Sound and Motion
  - Online Safety

- Online Safety is covered in lessons as well as having a whole school Safer Internet Day assembly which focuses on a different theme every year.
- Every year the opportunity is given to the whole school to participate int the Safer Internet Day Competition

Stage 2 - Additional Support

- Adapted worksheets for lower ability and SEN
- EAL/ INA Booklet created to allow easier transition and build up of skills before being introduced to mainstream Computing.
- In Class TA providing support for Lower ability and SEN
- WORD Aware activities to promote Computing Vocabulary
- On the spot feedback given throughout to promote progress

Stage 3 – Intervention

- During the on the spot assessment and feedback sessions, children that need RRI are identified.
- RRI done by the TA after school or during break/lunch

Stage 4 – Further Support

If summative assessment does not show sufficient progress being made despite intervention, liaise with SENDCO.

Intent

At Alexandra Park Junior School we offer a structured sequence of lessons, ensuring that we have covered the skills required to meet the aims of the national curriculum. The content allows for a broad, deep understanding of computing and how it links to children's lives. It offers a range of opportunities for consolidation, challenge and variety. This allows children to apply the fundamental principles and concepts of computer science. They develop analytical problem-solving skills and learn to evaluate and apply information technology. It also enables them to become responsible, competent, confident and creative users of information technology.

We want our Computer Scientists to:-

- Ask perceptive questions and develop deeper thinking;
- Think critically
- • Form and justify own ideas

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Year 3

Term	Unit	Strand	Sub strand
Autumn 1	Baseline / Basic Comp Intro / Basic Skills	CS	Technology in our lives
Autumn 2 Spring 1	Introduction to Scratch- Sequencing Sound	CS	Coding and Programming
Spring 1	Online Safety	DL	Online Safety
Spring 2	Stop Frame Animation	IT	Multimedia Sound and Motion
Summer 1	Presentation Skills	IT	Information Technology
Summer 2	Programming B – Events and Actions	IT	Coding and Programming

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Year 4

Term	Unit	Strand	Sub strand
Autumn 1	Programming A – Repetition in shapes	CS	Coding and Programming
Autumn 2	Programming B – Repetition in Games	CS	Coding and Programming
Spring 1	Online Safety	DL	Online Safety
Spring 2	Animation	IT	Multimedia Sound and Motion
Summer 1	Photo Editing	IT	Multimedia
Summer 2	Word processing	CS	Information Technology

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Year 5

Term	Unit	Strand	Sub strand
Autumn 1	Computer Systems and Networks	CS	Technology in our lives
Autumn 2	Programming A - Selection in physical computing	CS	Coding and Programming
Spring 1	Online Safety	DL	Online Safety
Spring 2	Flowol	CS	Coding and Programming
Summer 1	3D Sketchup	IT	Multimedia
Summer 2	Programming B - Selection in quizzes.	IT	Coding and programming

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Year 6

Term	Unit	Strand	Sub strand
Autumn 1	Programming A – Variables in Games	CS	Coding and Programming
Autumn 2	Programming B– Sensing Movement – Microbits	CS	Coding and Programming
Spring 1	Online Safety	DL	Online Safety
Spring 2	Kudo	CS	Coding and Programming
Summer 1	Spreadsheets	IT	Information Technology
Summer 2	Know Your Network	CS	Computer Networks

Progression of Knowledge and Skills

Alexandra Park Junior School

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science – Coding	KS1 National Curriculum – Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs		KS2 – National Curriculum 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 correct errors in algorithms and programs Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web Appreciate how [search] results are selected and ranked. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;			
	Scratch Jnr - I can add new characters and backgrounds; - I can use blocks for movement in different directions; - I can create short sets of sequenced instructions. - I can use different end blocks, including repeat forever; - I can change the size of characters to grow or shrink; - I can hide and show characters with an	**Turtle Logo and Scratch** - I can draw lines of different lengths using the fd command. - I can move blocks into the Scripts Area. - I can snap blocks together to combine commands. - I can turn the turtle using rt 90 and lt 90. - I can draw squares and rectangles. - I can create simple algorithms using a number	**– Introduction to Scratch** - I can identify the objects in a Scratch project (sprites, backdrops) - I can identify objects in Scratch have attributes (linked to) - I can recognise that commands in Scratch are represented as blocks - I can identify that each sprite is controlled by the commands I choose - I can choose a word which describes an on-	**Repetition in shapes Logo** - I can identify that accuracy in programming is important - I can program a computer by typing commands - I can explain the effect of changing a value of a command - I can create a code snippet for a given purpose - I can create a program in a text-based language - I can use a template to draw what I want my program to do	**Selection in physical programming** - I can control a simple circuit connected to a computer - I can create a simple circuit and connect it to a microcontroller - I can program a microcontroller to make an LED switch on - I can explain what an infinite loop does - I can write a program that includes count-controlled loops - I can connect more than one	**Variables in Scratch** • I can define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way a variable changes can be defined • I can identify that variables can hold numbers or letters To choose how to improve a game by using variables

Implementation

The lessons are a mixture of different types of activities. Every lesson includes a vocabulary word to learn and some will include a retrieval starter task. Lessons range from having theory, analysis, problem solving and practical tasks. Through the sequence of lessons, we intend to inspire pupils to develop a love of the digital world, see its place in their future and give build confidence. Cross-curricular links are also important in supporting other areas of learning and where possible this has been applied. The lessons and resources help children to build on prior knowledge at the same time as introducing new skills and challenges. In KS1, the focus is on developing the use of algorithms, programming and how technology can be used safely and purposefully. We do not teach KS1 in Alexandra Park Junior school however a baseline assessment is carried out to assess if these have been covered. In KS2, lessons still focus on algorithms, programming and coding but in a more complex way and for different purposes. Children also develop their knowledge of computer networks, internet services and the safe and purposeful use of the internet and technology.

Implementation

Vocabulary

To improve Vocabulary in Computing we have created knowledge mats with the meanings of each word. Every task sheet includes a vocabulary word which the child then has to find in the knowledge mat and then write the meaning.

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science – Coding	Scratch Jnr ScratchJr Bee-Bot Command Sprite Programming Block Joining Run Delete Reset Algorithm Value	Turtle Logo and Scratch Commands Clear Algorithm Program	Introduction to Scratch Scratch Programming Blocks Commands Code Snippet Sprite Sequence Event Task Algorithm Bug Debug Events and Actions Motion Event Action Sprite Algorithm Resize Blocks Debugging Errors Code	Repetition in shapes Logo Program Commands Code Snippet Algorithm Debug Repeat Loop Value Infinite Loop Count Controlled Loop Repetition in Games Value Loop Forever Infinite loop Animate Event Duplicate Modify Algorithm Debug Scratch Programming Sprite Blocks Code	Selection in physical programming Microcontroller Components LED Program Repetition Loop Infinite loop Count-controlled loop Condition True/False Input Output Algorithm Selection in Quizzes Selection Condition Loop Outcomes Conditional Statement Algorithm Program Debug Input Output	Variables in Scratch Variables Value Set Event Algorithm Code Program Debug Sensing Movement Microbit Input Output Process Selection Condition Variable If...then...else Random Sensing Accelerometer Navigation Algorithm Debug

Lesson 5 – Manipulating Objects

Word Aware: RESIZE — When you make an object bigger or smaller

Lesson 3 – Computer network connections

Word Aware: PROTOCOL — A protocol is a set of rules that say how information and data should be sent.

Implementation

Theory – Some parts of the curriculum are theory based. These lessons are

Year 3 – Online Safety
Year 4 – Online Safety
Year 5 – Online Safety and Strategic Searching
Year 6 – Online Safety and Know your Network

Implementation

Problem Solving – **Children are given problem solving based projects to complete in all their programming units. The 4 main problem solving concepts are decomposition, sequencing, repetition and selection. These are taught across the 4 years of Computing. Some Examples of these are:**

- **Year 3 – Sequencing in Sound**
- **Year 4 – Repetition in Shapes**
- **Year 5 – Selection in Physical Computing**
- **Year 6 – Variables in Scratch**

Implementation

Practical – **A lot of the Computing lessons include practical tasks where the children are creating documents or projects using the computer. The practical tasks tie in with the problem solving tasks and are usually the same units. I have included some examples below: The methd that we follow is Design, Create, Evaluate.**

Evaluate

Design

Create

Impact

There is a clear expectation that all classes are making progress towards achieving age related expectations. All objectives used in TLC and S2S that are used are also used for assessment and then grade is uploaded to target tracker. Progression of both knowledge and skills across the Key Stage secures pupils' understanding of the key objectives, as well as promoting independence. Learning in computing will be enjoyed across the school. The Computing Teacher has high expectations and quality evidence will be presented in a variety of forms. Digital and technological vocabulary will be promoted through each unit accurately, alongside a progression in their technical skills. Pupils will become confident using a range of hardware and software and will produce high-quality purposeful products. Children will see the digital world as part of their world, extending beyond school, and understand that they have choices to make. They will be confident and respectful digital citizens going on to lead happy and healthy digital lives.

Impact will be measured through 'spotlights' three times a year which will include :-

- Spotlights

- Learning walks

- Lesson observations and pop-ins

- Data analysis (December and June)

IMPACT - Year 3 – Examples of Progress
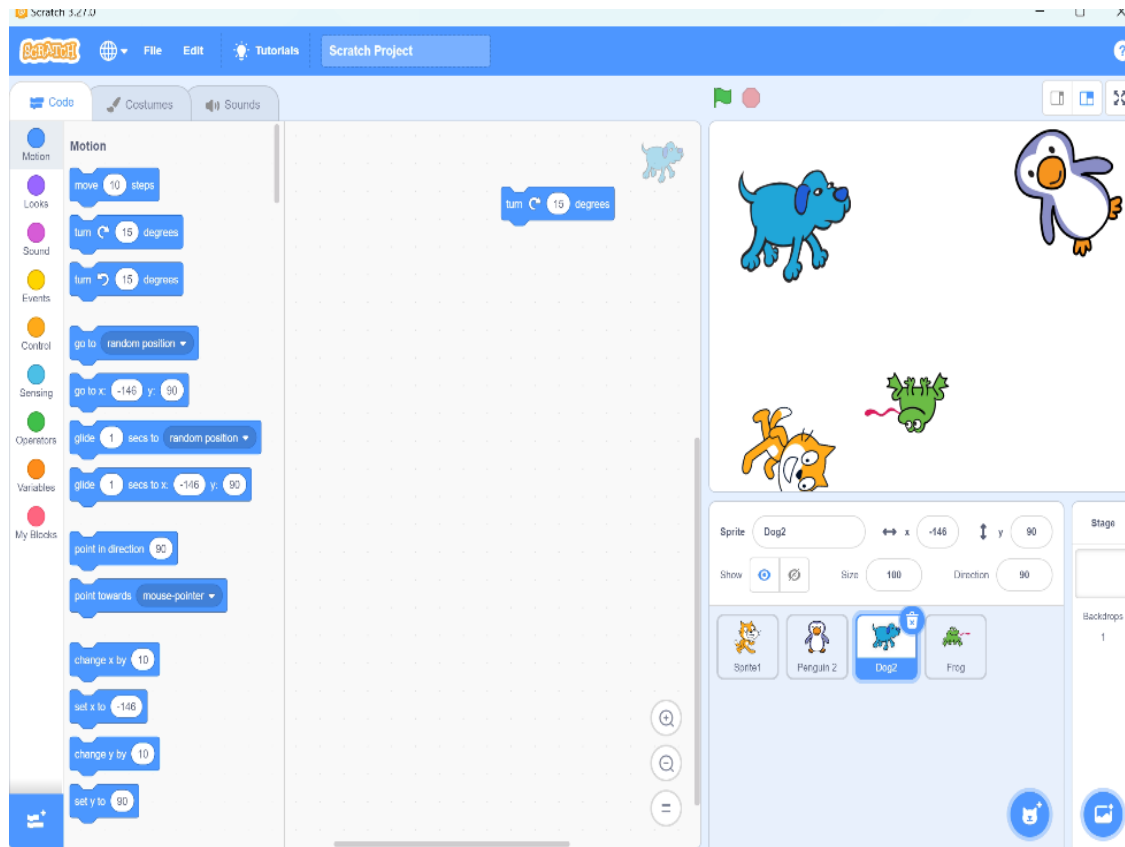
November 2023 – From programming singular blocks to learn the actions.
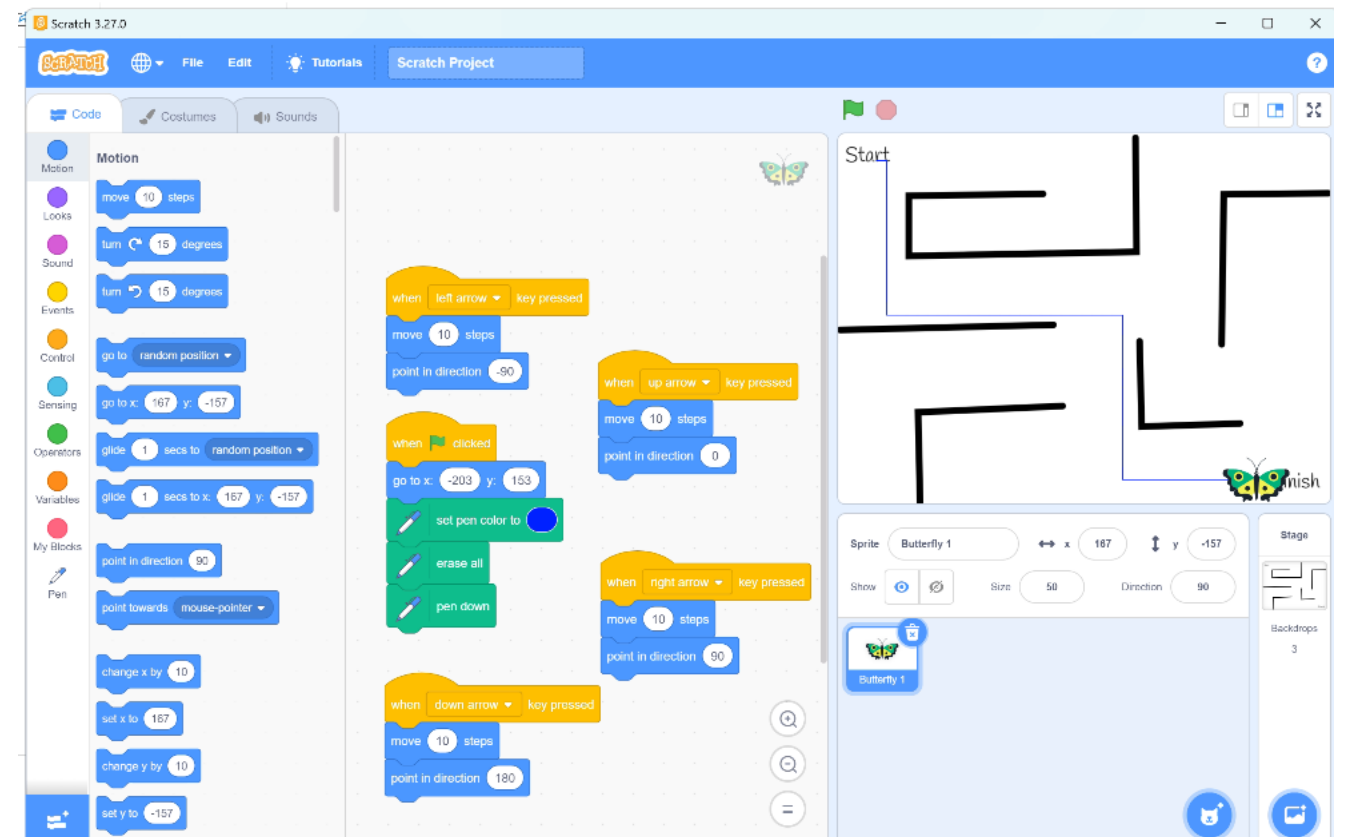
July 2024 – To learning the relationships between event blocks and actions. Clear progress as pupil has demonstrated sequencing in coding blocks. In this particular example the pupils has shown a clear understanding of sequencing the correct programming blocks in the correct order to be able to move the sprite around the maze as well as drawing a line to show the path of the sprite.

IMPACT - Year 4 – Examples of Progress
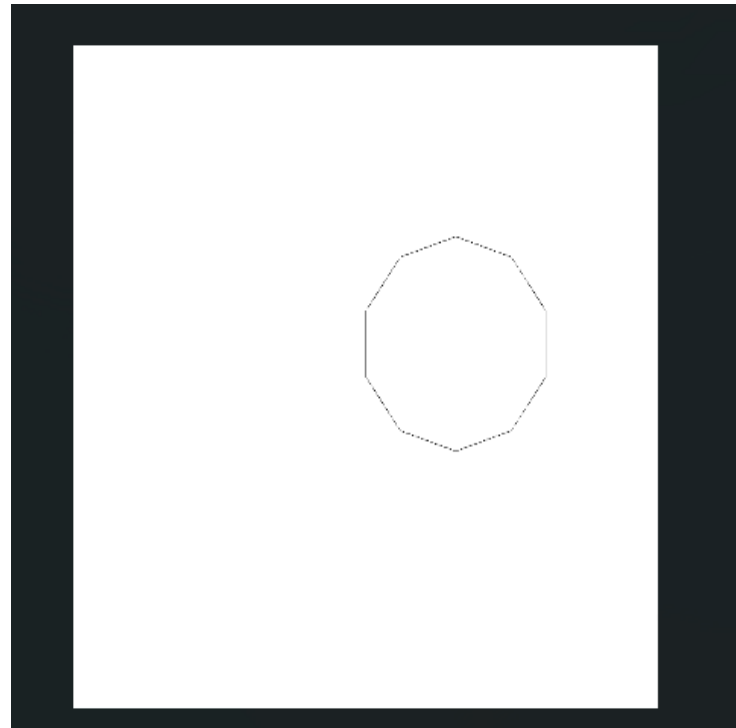
September 2023 – From programming shapes in a simple programming language (Logo) and using count controlled loops in single line coding…
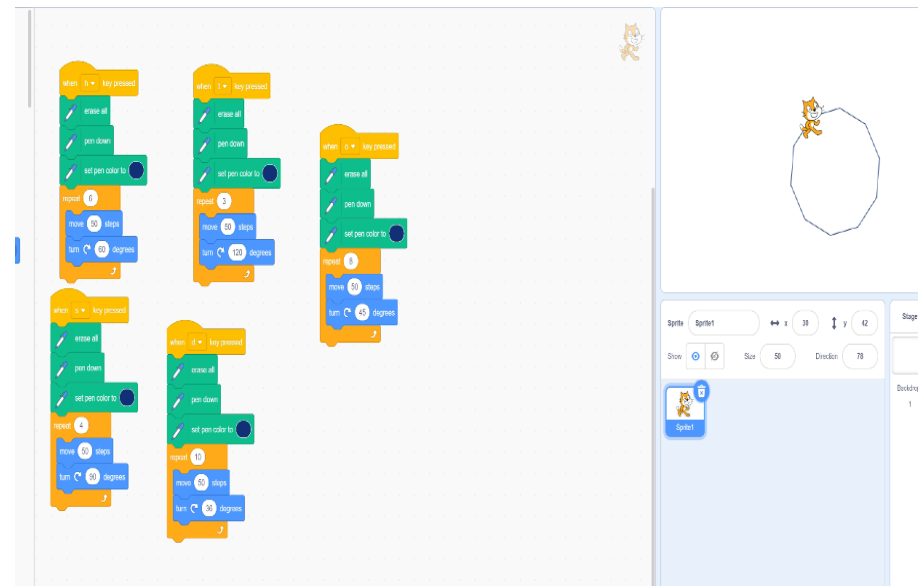
November 2023 – To transferring the concepts of count controlled loops and infinite loops into a programming language such as scratch and coding multiple lines of coding…..
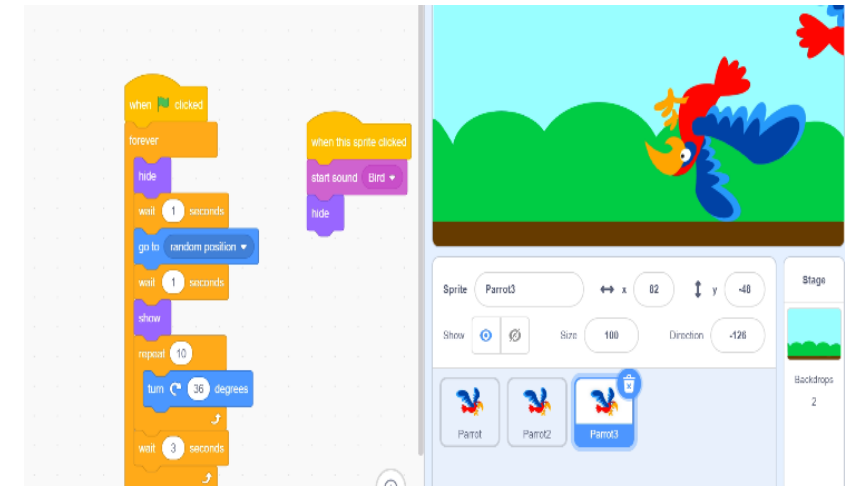
December 2023 – To then using knowledge of count controlled loops and infinite loops within the same set of coding to create a game.

IMPACT - Year 5 – Examples of Progress

September 2023– In this example above the pupil has started to learn how lo code in crumble. This is at the start of the physical computing where pupils will eventually connect the coding an actual crumble kit.

October 2023 – In this lesson above the students are introduced to the concept of Selection. How every condition has an action if the condition is true or false. This was then developed so that when the button is pressed it will activate the sequence of lights and will repeat

December 2023 – This concept was then further developed in Scratch however it was used in a different context. This time the concept of selection was used to create a Maths quiz. This was a higher level of coding as much more precision and detail was required.

IMPACT – Year 6– Examples of Progress
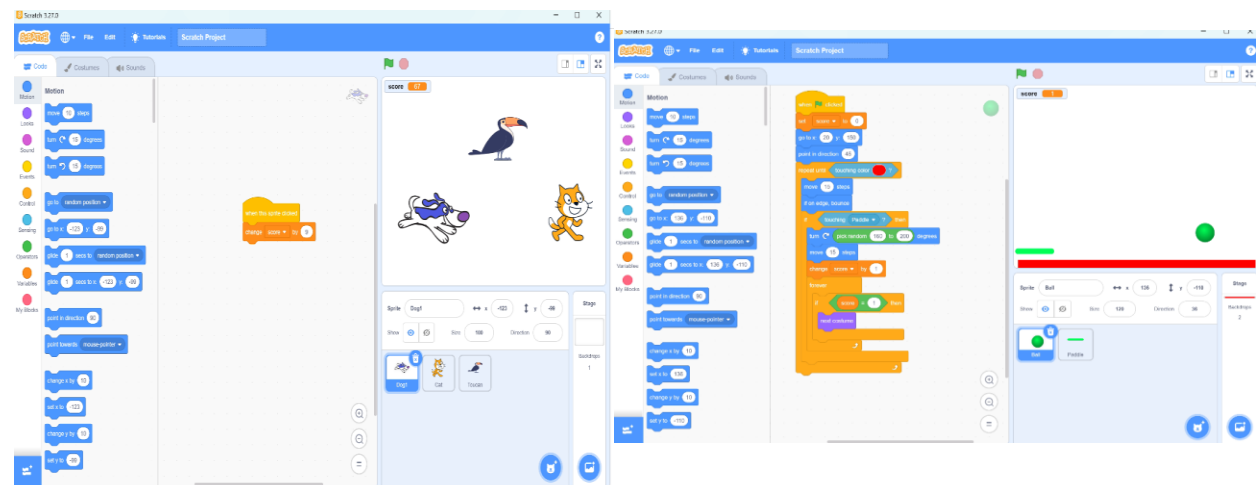
Sept 2023 - Pupils were introduced to Variables in coding. As you can see the above pupil started off with adding basic variables in code. One line of code. This was then further developed and practiced in the ping pong game.
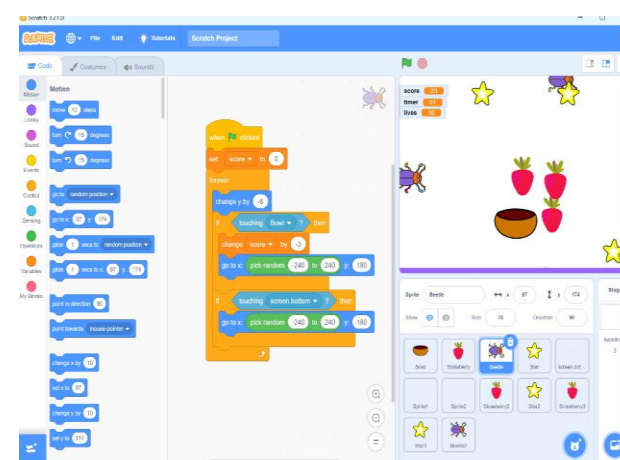
Oct 2023 - The pupil then combined all the programming concepts of Sequence, Repetition, Selection and then Variables in the Catching Game. They also added the sensing blocks which is advanced coding in Year 6.
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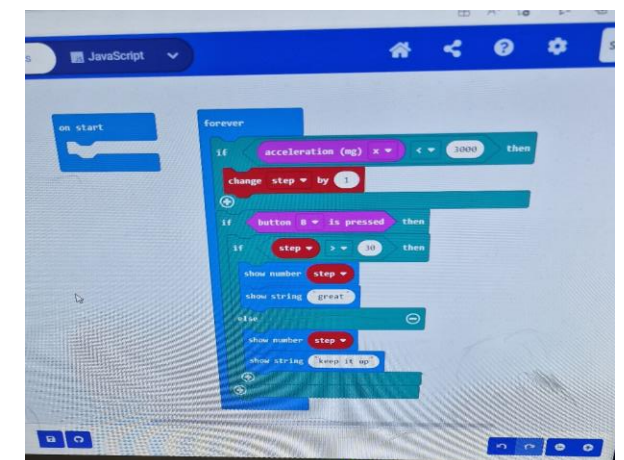
Dec 2023 - This was then developed further by creating their own step counter. Again all 4 programming concepts reinforced for this project to be successful and the pupil was able to assess the success of their project by having a working step counter.
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IMPACT – Year 3 to Year 6 – Examples of Progress
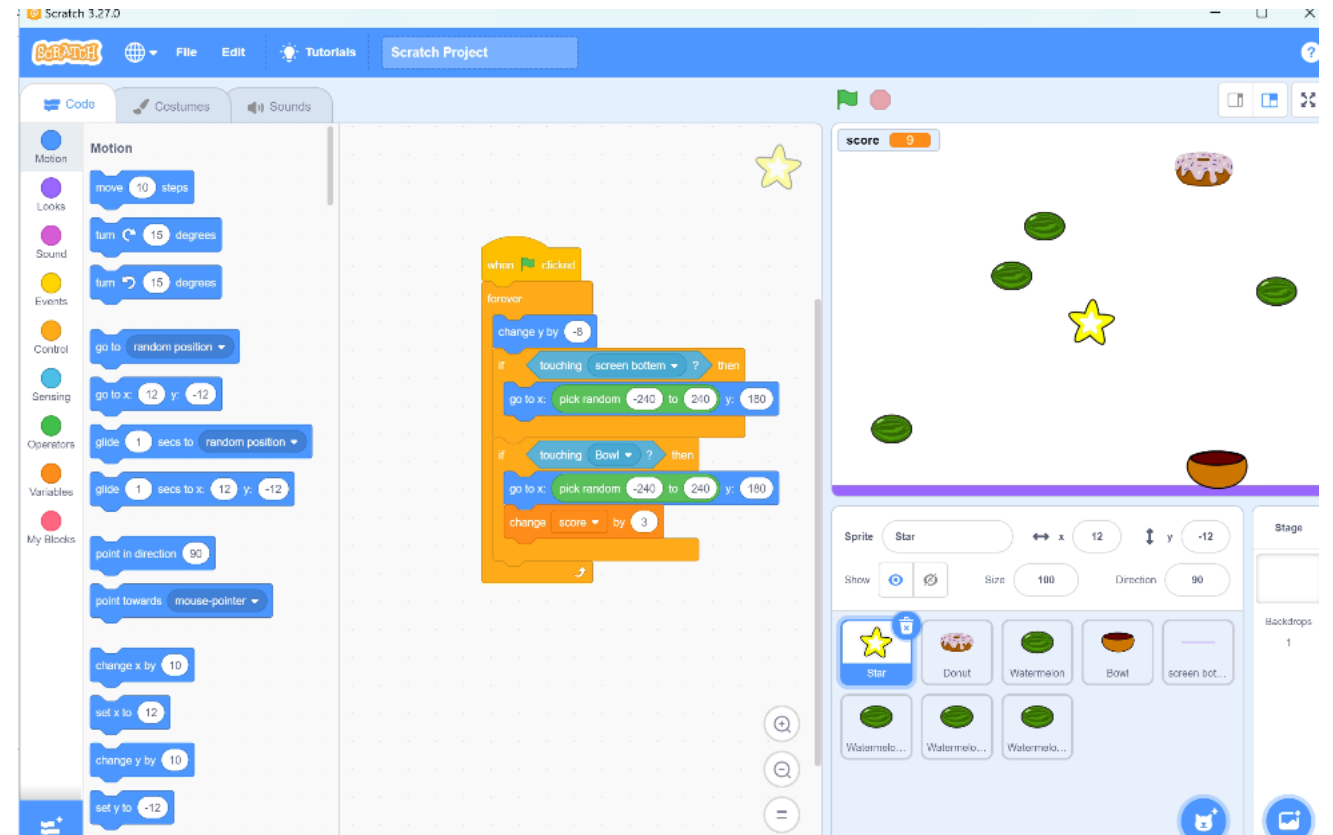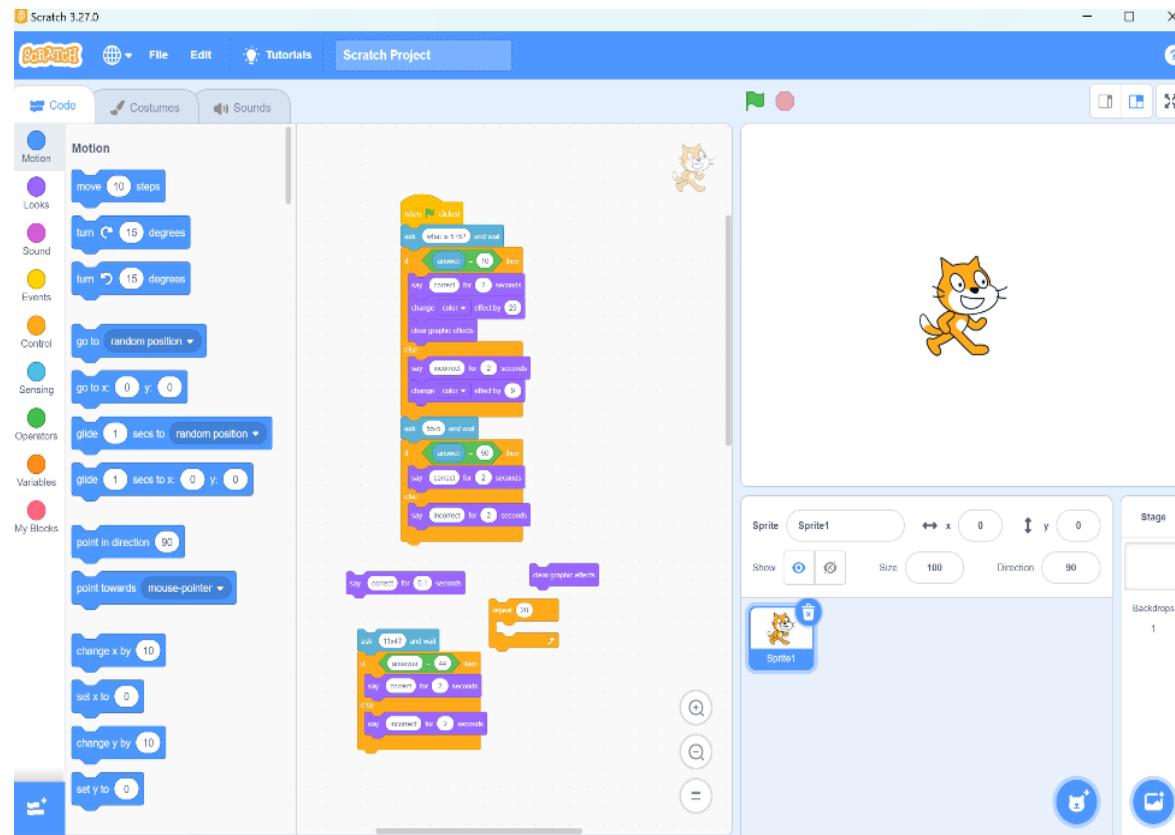
The current cohort of year 6 pupils did not have any computing lessons in the ICT suite when they were in Year 3 as this was the Covid year where children had to remain in bubbles and therefore were not allowed to go in the computer room. The recovery curriculum however allowed them to quickly build up and develop the skills they missed. In the example above you can see the pupil struggled to build up coding blocks to create a simple quiz where count controlled loops were introduced however pupil was not able to use them properly due to the lack of practice in the computer room. However as the years went on the pupil developed these skills and by year 6 was not only able to apply sequencing and selection , however was able to add variables too as you can see in the last picture.

IMPACT - Year 3 to Year 6 – Examples of Progress
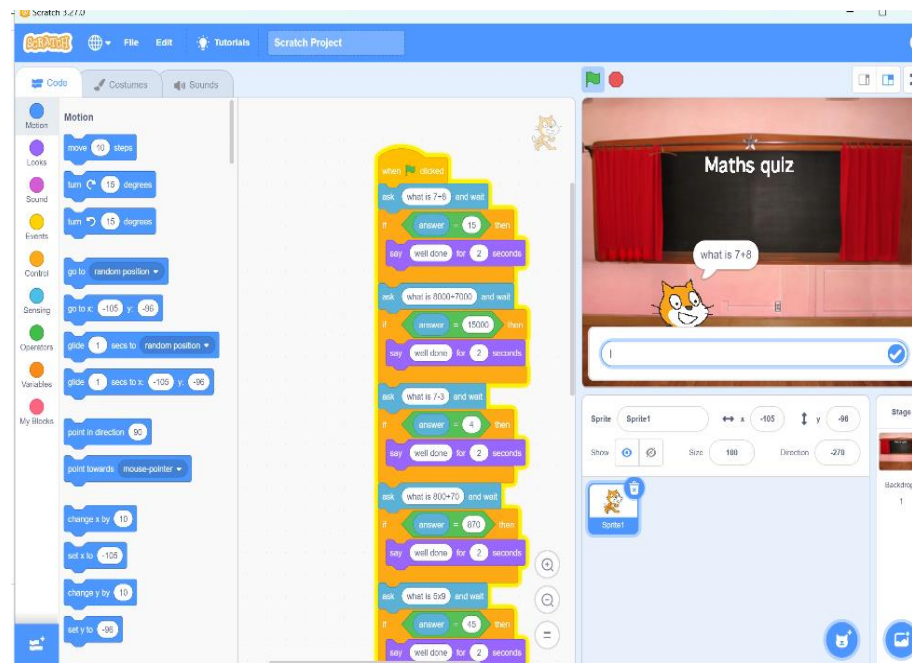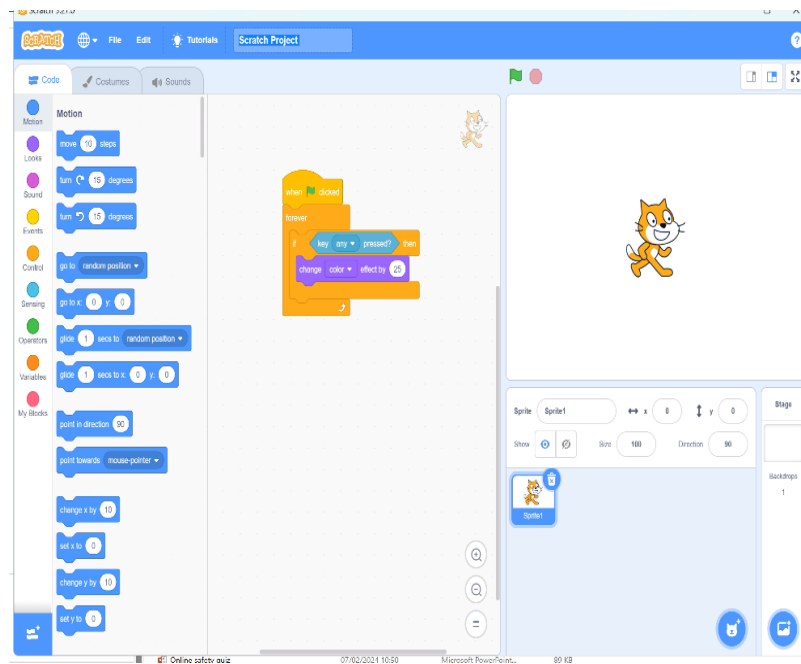
Again this pupil missed a whole year of Computing and started off with doing basic sequencing of instructions combined with repetition and selection.
They started off with very simple lines of code. This was then further developed to create a maths quiz which needed a higher level of detailed coding and understanding. As the pupil moved through the years she was Introduced to other programming software such as Flowol. Flowol is a control Simulation software that allows pupil to turn their algorithms into coding and Allows pupils to further develop sequencing, selection and variables.
In the final project in Year 6 the pupils had to then use all 4 programming Software concepts that they have been learning about since year 4 and Combine it into one project with the added addition of complex programming such as Variables and also using the sensing blocks in appropriate places. This can be seen In all the pictures.
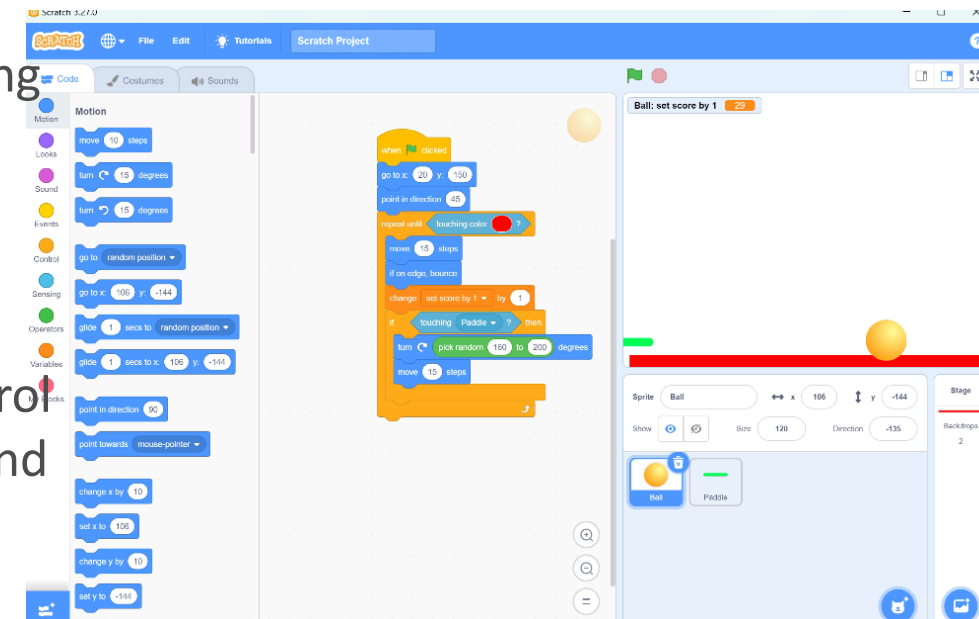
Year 3 – Pupil Voice
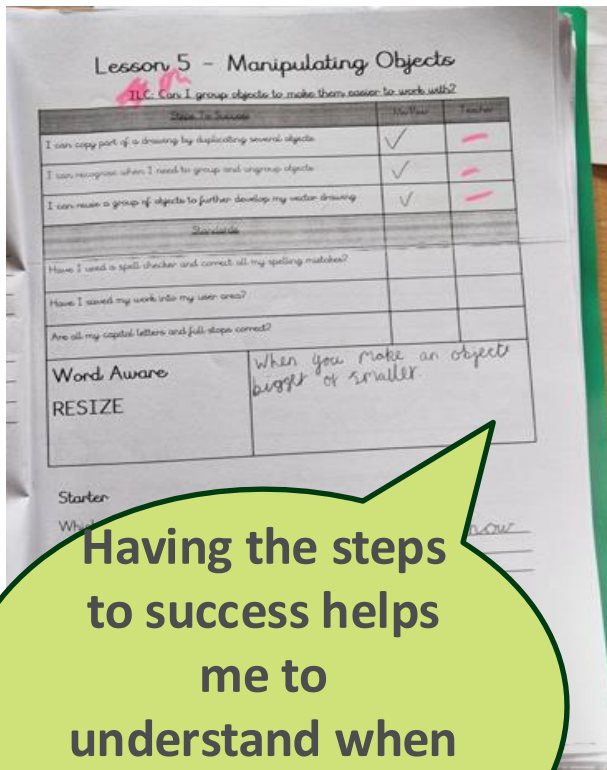
Having the steps to success helps me to understand when I've done my work.
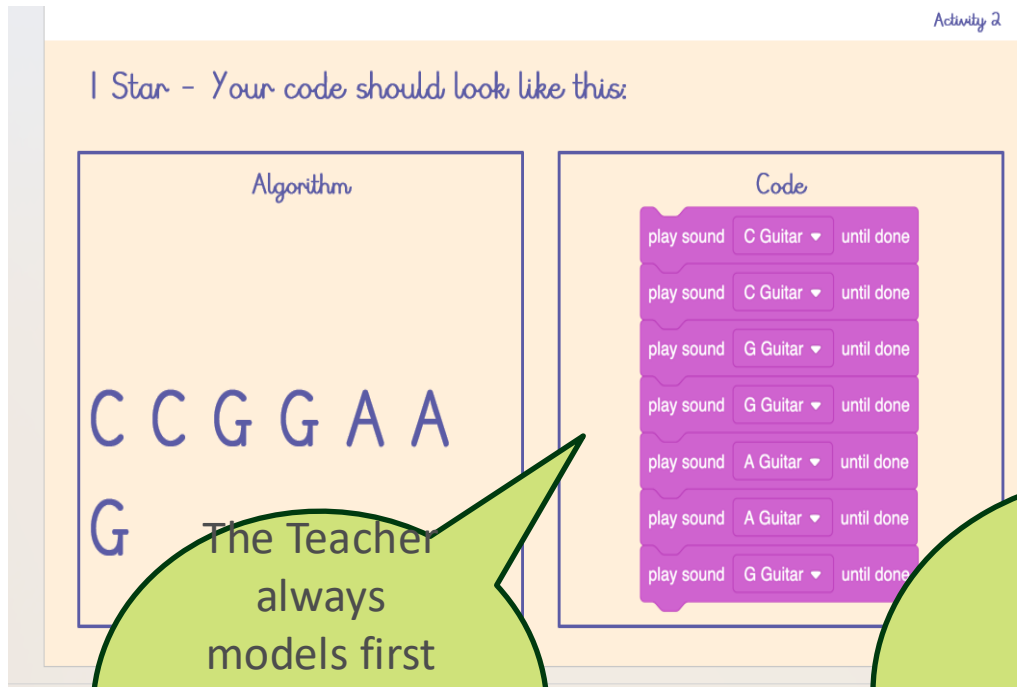
The Teacher always models first before we have a turn. This helps us a lot.
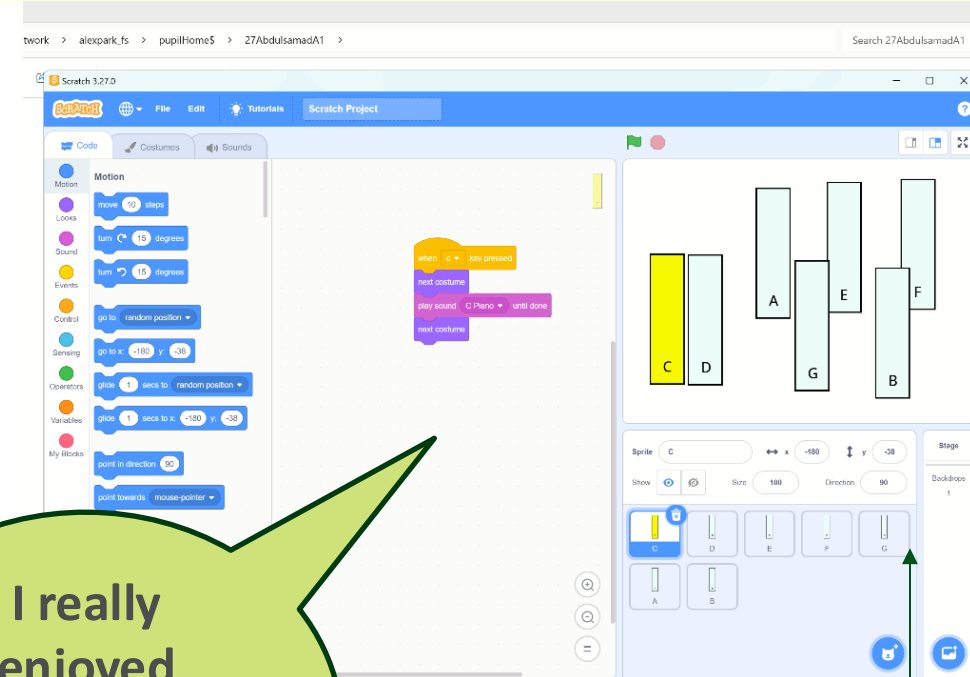
I really enjoyed coding the piano in Scratch.
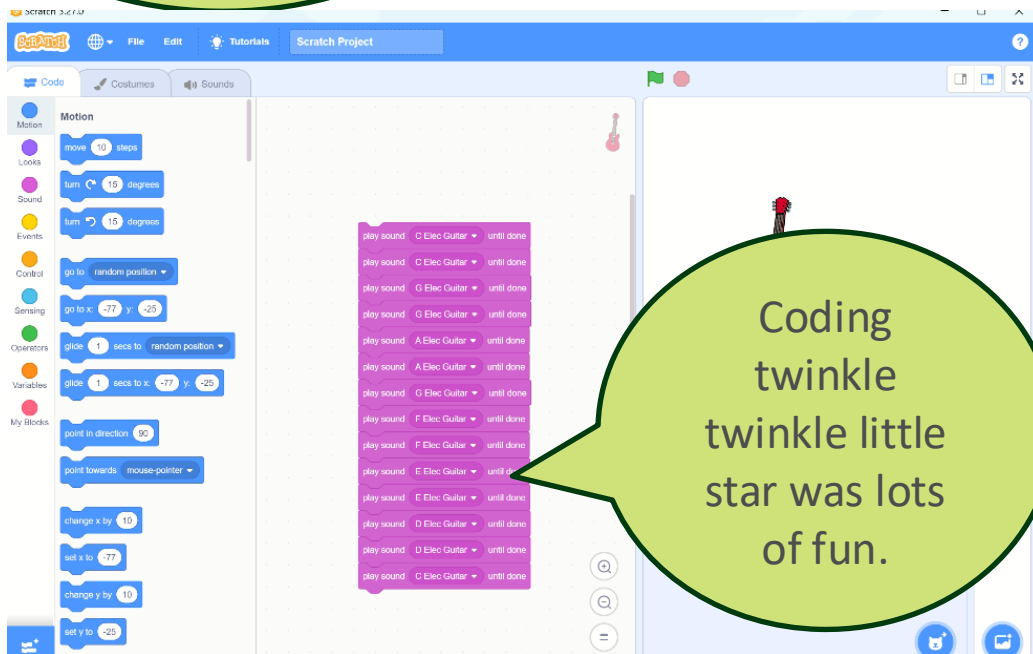
Coding twinkle twinkle little star was lots of fun.

In most of the project units the children always have to create a design first and then create.

Word Aware on every task sheet.
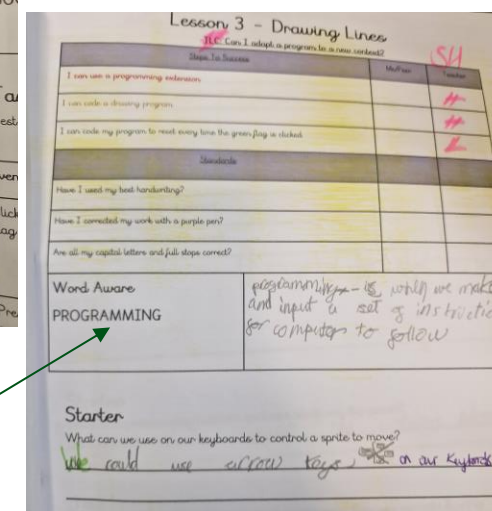
Year 4 – Pupil Voice
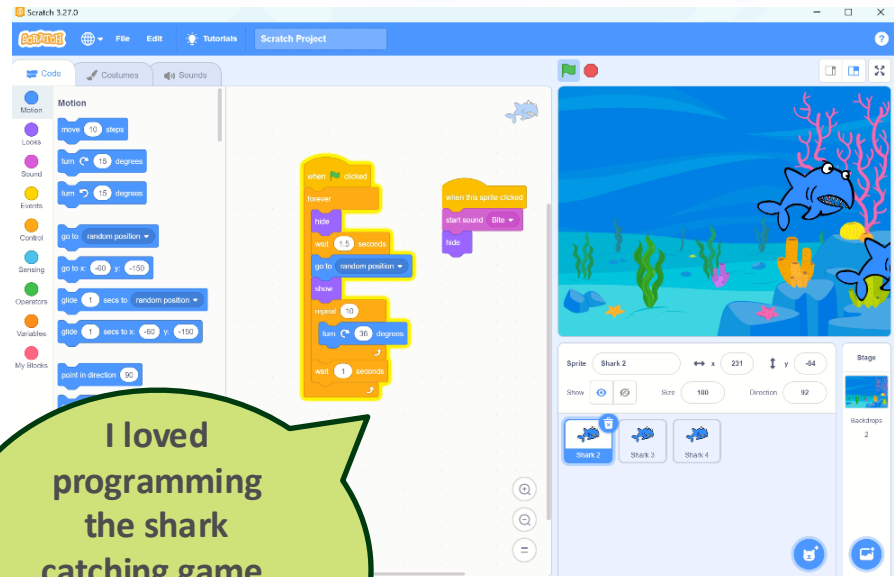
I loved programming the shark catching game. That was fun to play once we had finished!

I enjoyed programming the drawing of different shapes in Scratch..

To help pupils with projects it was always broken down by planning first, creating and then evaluating.
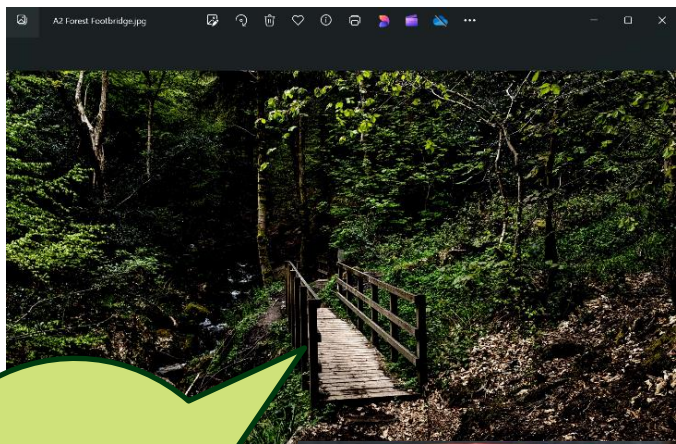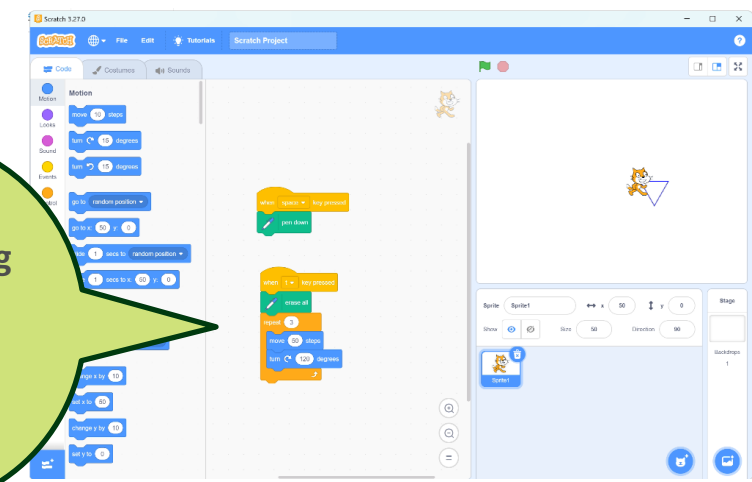
The Photo Editing unit was lots of fun.

I didn't realise how much time you have to spend editing pictures. It was lots of fun.
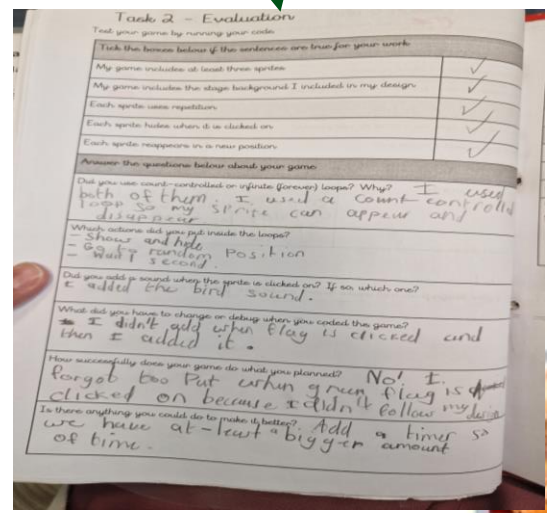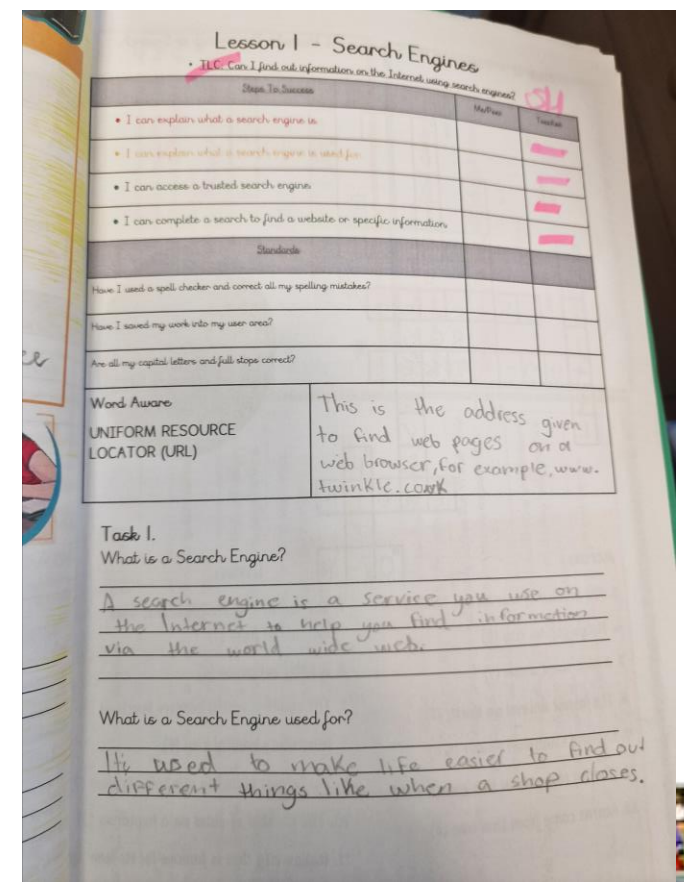
Year 5 – Pupil Voice
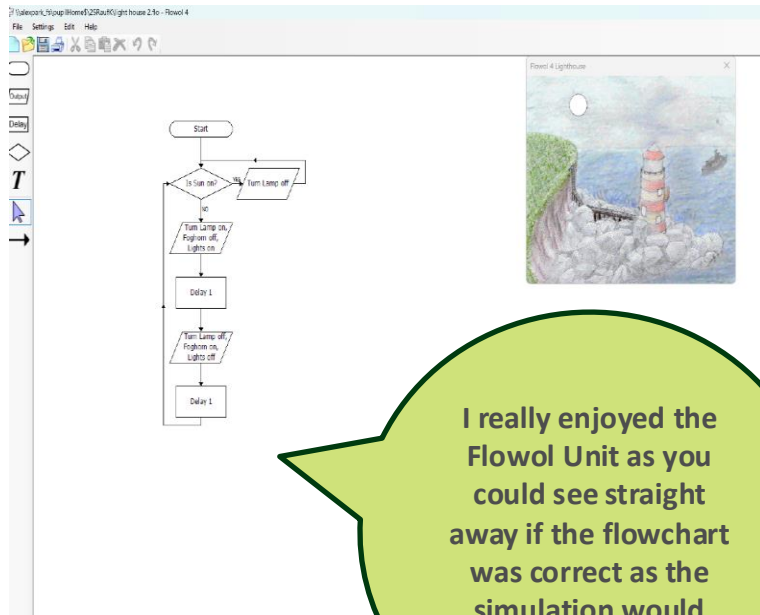
I really enjoyed the Flowol Unit as you could see straight away if the flowchart was correct as the simulation would work. It was fun!
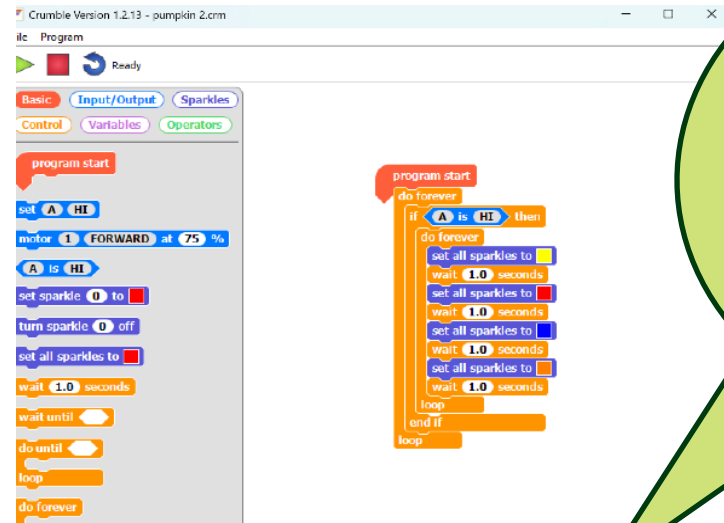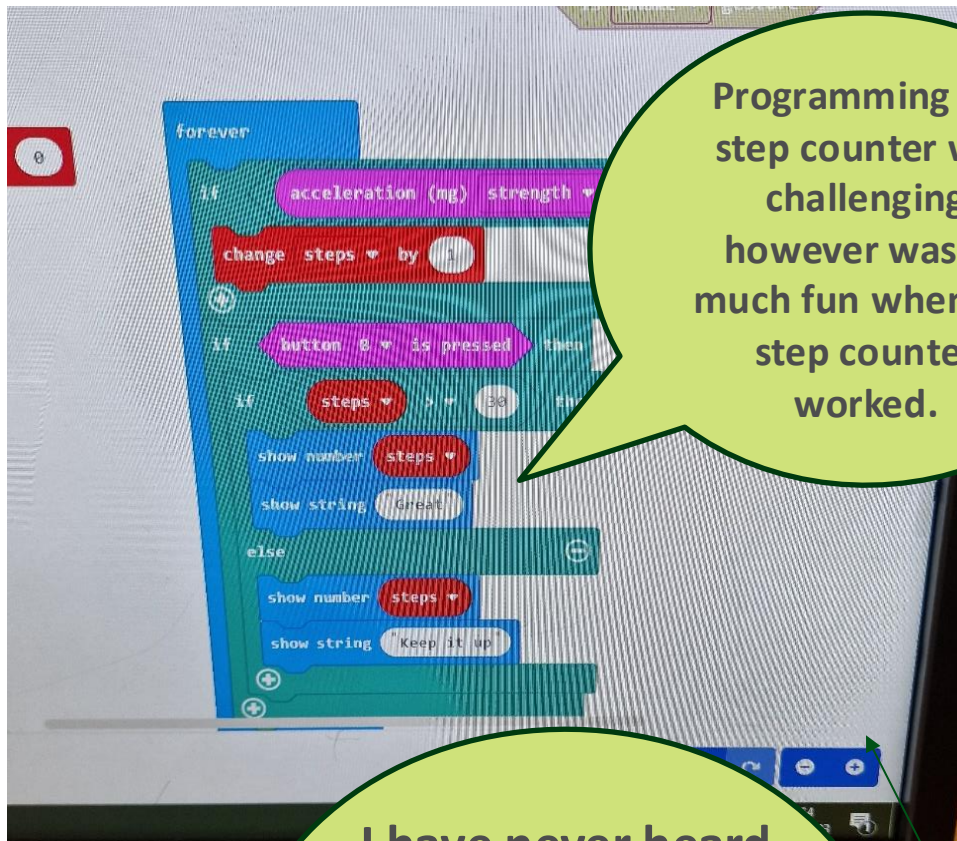
The best thing in Computing this year was the crumble kits. Actually seeing our programming in action on the pumpkins was so much fun to do.
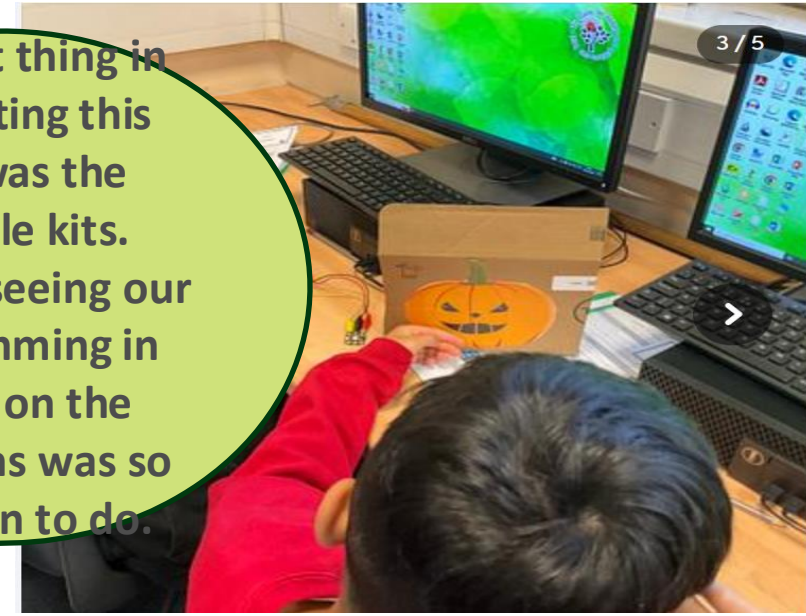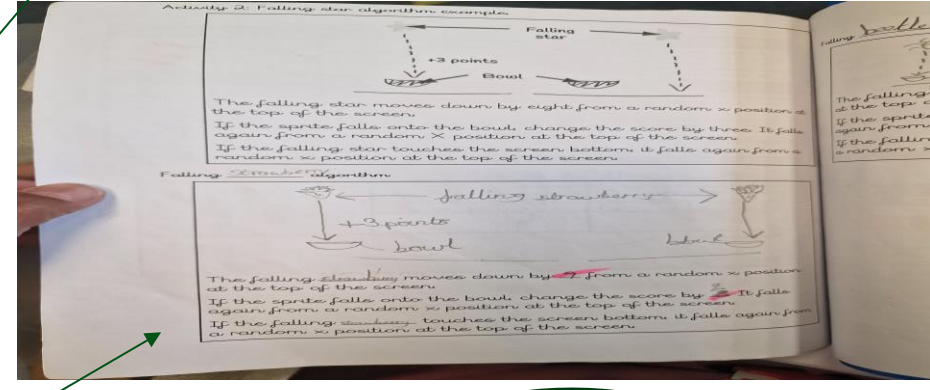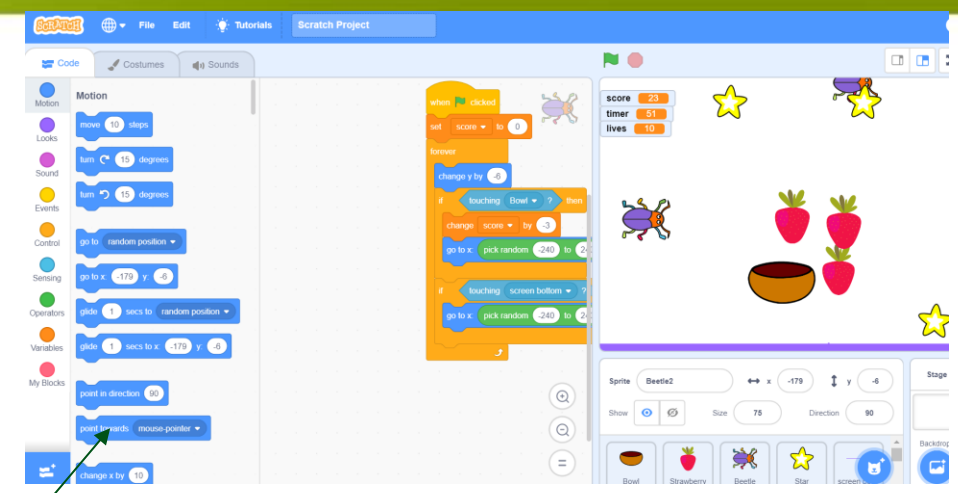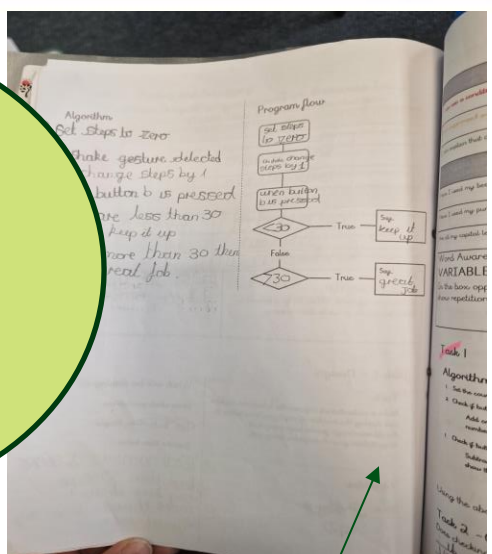
I had a lot of fun creating the Maths quiz. It was so satisfying to be able to play it in the end knowing that I created it.
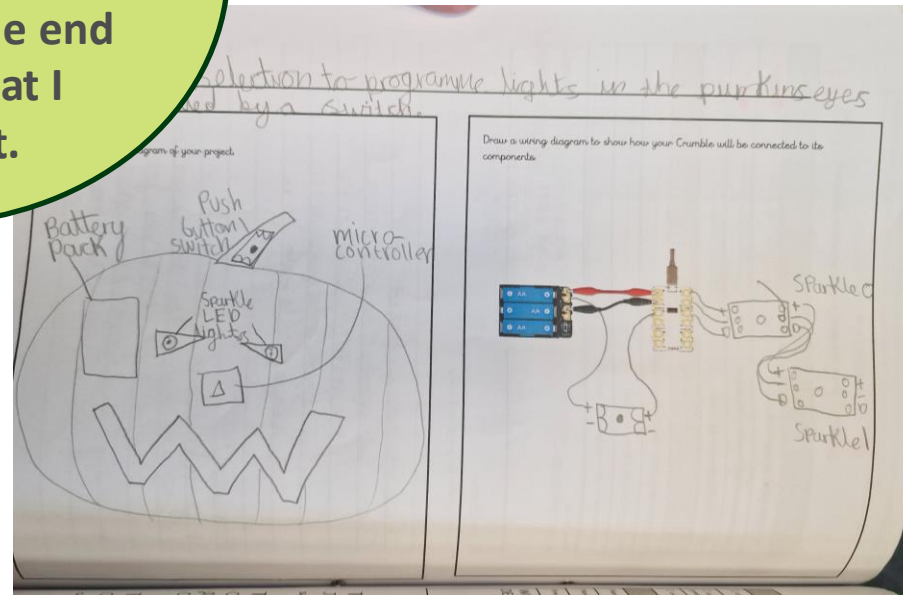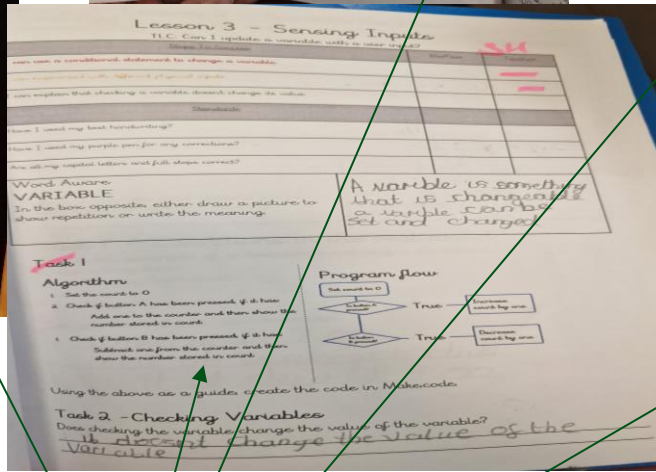
Year 6 – Pupil Voice

Programming the step counter was challenging however was so much fun when the step counter worked.
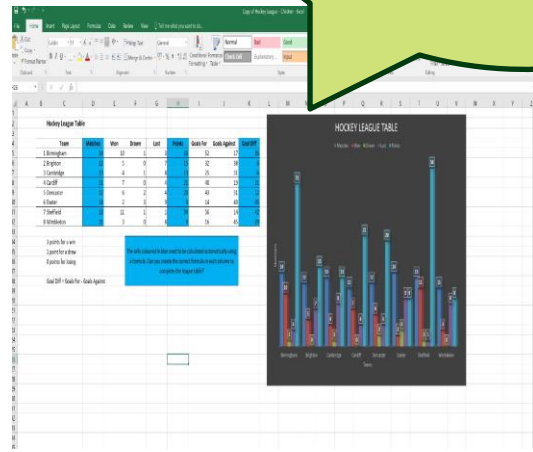
I have never heard about spreadsheets before but some of it was actually fun..
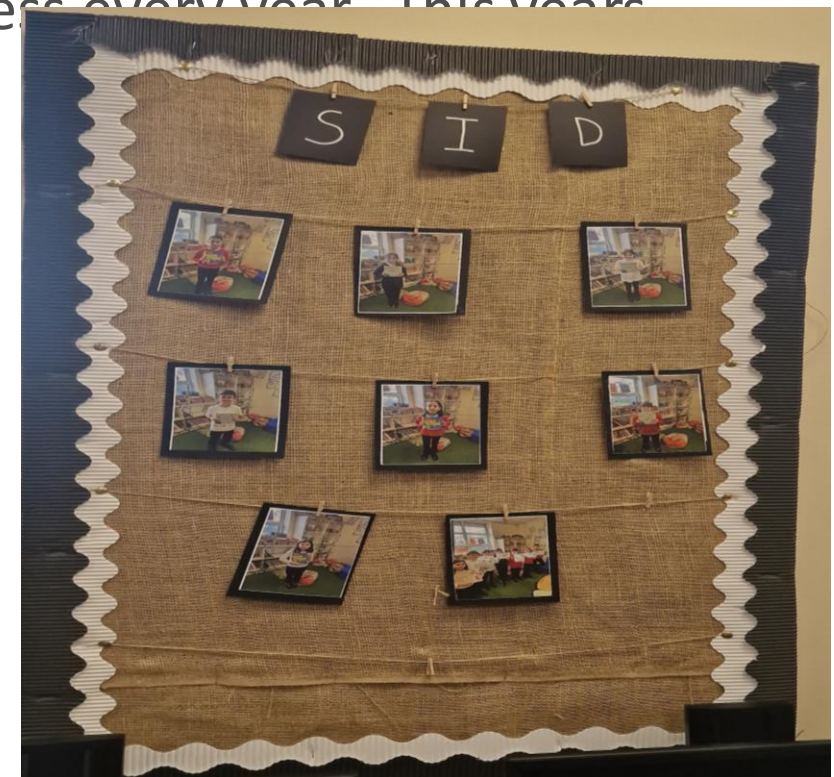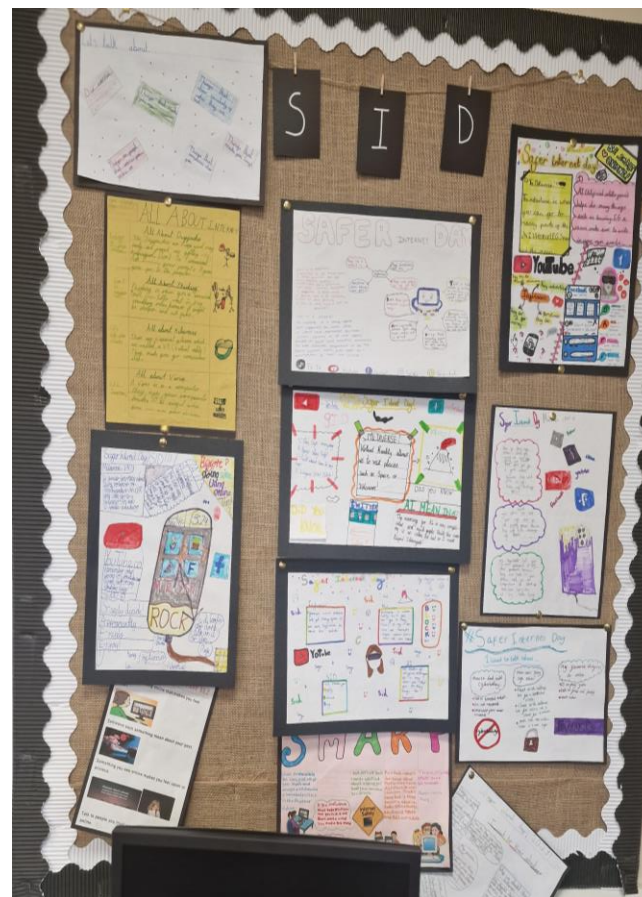
I really enjoyed programming in Kodu. It was different and loved that it was in 3D. Made it more fun.

For most the projects in Year 6 the children continued to follow the design, create, evaluate method. Children found it easier to create a project when they have a clear design to follow.

Safer Internet Day

Every year at Alexandra Park Junior School we take part in Safer Internet Day. This is the UK's biggest celebration of Online Safety. Each year they cover an online issue or theme that speaks to the things young people are seeing and experiencing online. I take these themes and adapt them for the children in our school. I take the different concepts of online safety and teach it to the children every week. Then at the end of the term I hold a whole school assembly to reinforce the lessons that have taken place leading up to the assembly. To make Online Safety fun for the children I hold a yearly Competition based on the Year's online safety theme and the winners are given prizes. Always a great success every year. This years winners are shown below.

Displays