Fireworks

Activity Structure – 45min

Activity	Timing
Warm up Game	5 mins
Introduce Story and Project	5 mins
Main Activity	30 mins
Final test & debug	throughout
Share with group	5 mins

Overview

This is the second project for Autumn 2. Although there is some drawing, the simple version should suit new coders.

Let's create a beautiful Bonfire Night-themed animation featuring a flickering bonfire, a spinning Catherine wheel and an exploding rocket firework. Even better if we can add sound effects too!

Learning Objectives

- Use the same start block to make two or more characters do something simultaneously.
- Use the show & hide, and grow & shrink blocks to create a visual effect.

National Curriculum / EYFS Curriculum Links

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Warm up game: Flashcard sorters

- Spread the flashcards around the room or on the table.
- *Oh no! My flashcards are such a mess. Could you help me to sort them into the correct piles?*
- Challenge the children to find the flashcards and put them into the correct pile.
- Depending on how calm your children are you could do this at a table, with the children taking turns, or around the room with the children all moving around to locate the cards and put them into the correct pile (have one pile for each corner of the room: motion, start, looks and control.

Introduction (discuss the project together, share ideas and create excitement)

- Encourage the children to share their experiences of fireworks: *Does anyone know what a firework is? Have you ever seen a firework? Is it noisy or quiet? What colours are they?* Fireworks are used to celebrate lots of different things. You may have seen them at a wedding or during Diwali or on Bonfire Night or maybe another celebration. Remember, fireworks are very dangerous and you must never touch them, or go near them without an adult.
- Show the children the main project (or whichever project suits the ability of your class).
- *How could I have made the bonfire flicker? How many characters are there for the Bonfire?* Discuss how the effect has been created (have the looks blocks flashcards to hand).
- Ask the children to read the script for each of the flame characters. *Which block is used at the end of each line of code? Why?*

Project Plan

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Fireworks

Main Activity Key questions and teaching

1. Select a night-time background.
2. *Let's draw the bonfire characters first.* Use the Paint Editor to draw one pile of logs character and three separate flame characters.
3. Resize the flames so that they fit together. *How do we resize a character?* Position them to look like a bonfire.
4. *Let's code the flames:* use the looks blocks to create a visual effect for one of the flames. *Shall we make it grow & shrink, or flash? How could I make this happen? Which code blocks will I need to use? How will I make it keep on happening?*
5. Give the children time to tinker and experiment with creating different effects. *What about if we also use a speed block? Where should I put it in my code?*
6. *Now let's code the other two flames. Try to use different visual effects for two of the flames. Once you're finished, run the three flames' code together to see how it looks.*
7. *Do you also want to add a sound recording to the bonfire? What sound might it make?*
8. Now let's create the Catherine Wheel: use the line tool in the Paint Editor to create a multi-coloured spiral. Support new coders with the drawing.
9. *How could we make the Catherine wheel spin around continuously? Could we add a speed block? How about using one of the visual effects we used for the bonfire flames? Flash, or grow & shrink.* Again, give the children time to tinker and experiment until they're satisfied. Children who finish early could add a sound effect.
10. Now let's do the rocket. Either draw a rocket or resize the one in the library.
11. The rocket code is quite complicated. Depending on your children's abilities they could either copy you as you code it or attempt to code it themselves. You could support them by laying out the flashcards of the blocks they will need. *How do you think I made the rocket move diagonally?*
13. Finally, let's do the rocket's exploding sparks. Use the circle tool in the Paint Editor to create two characters made up of a shower of multicoloured dots.
14. *How could I trigger the sparks to appear once the rocket is up in the sky?* Show the children how to use an orange message block (sent by the rocket) to trigger the sparks' code.
15. *We want the sparks to 'appear' once the rocket hits the sky so let's make them hide at the start.*
16. Code the sparks so that they appear and move on a loop (probably about five times) before 'hiding' again. Give the children time to experiment with creating different effects.
17. Finish by recording a sound effect for the rocket and the fireworks.

Teaching points
- Have the code sheets available for the rocket and the rocket sparks so the children can copy-code if they fall behind.
- Support any children who find the drawing tricky. They could work with an adult or a friend.

Possible Extensions
- Can you keep the firework show going by coding them to repeatedly reset and reappear?
- Create and code additional 'spark' and 'flame' characters.
- Add some narration. What is Bonfire Night?

To Simplify
- Use just one or two flames for the bonfire. Add a spinning Catherine wheel and some flickering firework sparks (but leave out the rocket).

Finishing up
Share the projects with the class. Discuss the different visual effects created by the children, i.e. *I really like how your flame _____. How did you make it do that?*

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