Flowcharts: Playground Games

Learning Objective:	Success Criteria:
To understand how a flowchart can be used to represent everyday actions To understand the basic shapes used when constructing a flowchart	

Activity:	**Unplugged**

- Explore a flowchart for an everyday activity or game such as this Stuck in the Mud one. How does it work? Does it help you to understand how to play the game?

- What do the shapes stand for? Can you describe (to a partner) what the different shapes do in the flowchart?

- Now try to piece together the chopped up flowchart pieces for playing 'It' (remember to draw arrows between the shapes and include 'yes' and 'no' routes for the answers)

Help! I'm Stuck!	**Need a challenge!**
- Decompose the problem: - Follow one 'route' at a time - Act it out one step at a time – does your algorithm work?	**What next?** Debug! - Explore the bugged 'Hide and Seek' flowchart - Can you debug it and make it work correctly?

Resources drawn from www.code-it.co.uk

Flowcharts: Everyday Activities

Learning Objective:	Success Criteria:
To create an algorithm including: - Sequence - Selection - Abstraction	

Activity:	**Unplugged**

- Create a flowchart for a simple, everyday activity such as getting up and ready for school in the morning, making lunch or buying something from the local shop.

- Explain the 'journey' to a partner – what are the steps which lead to the final outcome? What order should they happen in? What questions need to be asked and what different 'routes' might be followed?

- Use abstraction – remove any unnecessary details to simplify the instructions

Help! I'm Stuck!	**Need a challenge!**
- Decompose the problem; one step at a time! - Talk through the sequence of activities with a partner. Record them using everyday language first…	**What next?** - Can you create some sub-routines? What activities could happen alongside the main one (e.g. making toast)?

Some ideas and resources drawn from www.code-it.co.uk

Flowcharts: Lighthouse

Learning Objective:	Success Criteria:
Create a flowchart-based algorithm to program a sequence of outputs including a repeat loop	

Activity:	Plugged

Create a program for a Lighthouse (link to DT project). Think about:

- What pattern the light should follow (each lighthouse has its own sequence so it can be recognised at sea). Create a 'distinct flashing sequence' and loop your sequence so your lighthouse can be identified

- Can you link a sound to the light? Create your first sequence in Flowol4, duplicate it and then adjust the commands and timings for sound

Help! I'm Stuck!	Need a challenge! What next?
Start small – just program the sequence of commands for one light. Now add in more outputs…	Include a light sensor to act as a switch which automatically turns the lighthouse on and off according to available daylight. How can you do this differently with an analogue sensor?

More info on Lighthouses can be found here

Flowcharts: Fairground Ride

Learning Objective: Create a flowchart-based algorithm to - program a sequence of inputs and outputs - Control the direction and speed of a motor	Success Criteria:

Activity:	Plugged

Using the fairground ride models you 'made earlier'(!), create a flowchart to make an exciting and thrilling ride experience.

Program the:

- Motor, including speed and direction
- Bulbs and buzzer to create a warning light and sound for the start and end of the ride
- Bulbs and buzzer to improve the ride experience and make it more exciting…especially in the dark!

Help! I'm Stuck!	Need a challenge! What next?
- Look at an example flowchart (e.g. for controlling a lighthouse). How was this one created? - Find out how to control a motor using the 'mobile' mimic	Don't forget safety! Can you build in a safety switch, for example onto an entry gate which must be shut for the ride to work?

Flowcharts: Baby's mobile

Learning Objective:	Success Criteria:
Use digital (e.g. a push switch)and analogue inputs (e.g. a light sensor) to control a variety of outputs Include, change and control variables in your program	

Activity:	Plugged

Use the 'Mobile' mimic in Flowol4. Can you create a system which:

- Keeps a baby entertained when she's unsettled?
- Helps a baby feel happy and secure in the dark?
- Responds to the baby's noise as it gets louder and quieter?

The key to this is controlling the analogue sensor on top of the mobile. You can decide what the value of this sensor represents. It could be light perhaps, temperature or maybe sound.

- Program the mobile to respond in different ways depending on the input given and the reasons for it which you have identified.

Help! I'm Stuck!	Need a challenge! What next?
- Work out how to control each input and output separately before trying to join them all together	- Be adventurous! Create multiple algorithms on one page, or use sub-routines in your procedure