

Lesson Plan - Scratch

Introduction to Algorithms

Code Playground



```
int x=10
for(int a=0; a<x; a++)
{
  if(a==x) // check for c
    break; // exit loop
}
```



Learning objectives

- *I can explain what an algorithm is and how they relate to real life and computer programmes. I can create an algorithm in Scratch”
- Pupils should be taught to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

Resources

- Pencil and paper
- Laptops or desktop computers
- <https://scratch.mit.edu>

Main activity

Ask the children to put their hand up if they brushed their teeth this morning. How do they know how to brush their teeth? A parent or another adult probably showed them how to do it when they were younger.

Computer programmes are the same. They only know how to do something if we tell them exactly how to do it.

Hand each child a piece of paper and tell them they are going to be the computer. You will be the computer programme with an algorithm designed to get the computer to draw a very specific picture.

Read out a set of instructions to the children to help them draw the picture in the guidance notes. The children shouldn't know what the final picture looks like and shouldn't share their drawing with the rest of the class until the end.

Purposely keep the instructions quite vague – the idea is that the children should all end up with a very different outcome because our algorithm wasn't specific enough.

Repeat the activity with more specific instructions which will allow the children to draw the correct picture – it is possible for a computer to 'misunderstand' an algorithm if we aren't specific enough and we might end up with a different result than we were expecting. Think about what would happen if you tried to tell an alien to 'go through that door'? Is the algorithm specific enough?

The children should now write an algorithm in Scratch to programme their Sprite. They can write any algorithm they wish, as technically any sequence of code that translates into an output on the stage is an algorithm. The children should be able to demonstrate and explain to their peers how they created specific instructions in order to complete the task.

Differentiation

Lower Ability/ASN

Code your sprite to give a sequence of instructions for one of the examples used in the lesson (e.g how to brush your teeth) by using the 'say' blocks.

Higher Ability/Extension

Use a combination of blocks to create a more complex algorithm, i.e. 'motion', 'looks' and 'control' blocks.

Create more than one algorithm in your programme to solve different problems.

Plenary

Have the children try each other's' games and give feedback. What went well and what could we do to improve?

Assessment Questions

What is an algorithm?

Think of an algorithm we use in real life?

What do we need to remember when creating algorithms in computer programming?