Noteable™

Giving Instructions

Using Algorithms in Python

Resource

Primary

07-11 years

Contents

Noteable Activities for Schools: Giving Instructions

These resources are a guide for teachers to demonstrate to the whole class or direct individual students as appropriate. The activities below can be directly distributed to pupils.

For instructions on how to install and use Noteable resources, please look at our guides for teachers in GLOW: GLOW guidance for teachers to start using Noteable.

Content and Curriculum links

Level	Context	Indicators
7-14	Using basic algorithms to give instructions	Insert, Markdown, List

Knowledge	Using bullet point lists to give instructions
Curriculum links (England) Computing KS2	• understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
Scottish Curriculum for Excellence	**Experiences and Outcomes:** • I can demonstrate a range of basic problem solving skills by building simple programs to carry out a given task, using an appropriate language. TCH 1-15a **Benchmark:** ○ Simplifies problems by breaking them down into smaller more manageable parts. ○ Constructs a sequence of instructions to solve a task, explaining the expected output from each step and how each to contributes towards solving the task. ○ Creates programs to carry out activities (using selection and fixed repetition) in an visual programming language.
All: Cross-curricular opportunities	The activities have identified opportunities for Geography and Numeracy.

What is an Algorithm?

An algorithm is like a recipe—a set of step-by-step instructions to solve a problem. In an algorithm, we list each instruction and plan the order in which they should be followed.

If we want a computer to do something, we need to write a computer program that tells it exactly what to do and how to do it, step by step. To do this, we use something called an algorithm, which is like the plan for our program.

Think of computers as being only as good as the instructions they receive. If we give a computer a bad set of instructions (a poor algorithm), we'll get a bad result. That's why we say, "Garbage in, garbage out."

Algorithms are used for all sorts of things, like doing math, processing data, and automating tasks.

When we face a problem, it's essential to plan out how to solve it correctly. We can do this by breaking the problem into smaller parts and figuring out how they should fit together in the right order to solve the whole problem. This planned order of steps is what we call an algorithm. A good algorithm should be easy to understand and have a clear start, finish, and a set of clear instructions in between.

Activity 1

You asked your friend robot to make a nice cup of tea, but robots, as well as most electronic devices need very specific step by step instructions called algorithms to perform a task.

Can you give your friend robot very specific instructions on how to make a nice cup of tea just the way you like it?

Let's start together:

1. Put water into the kettle

2. Turn the kettle on

3. Put a teabag in a mug

4.

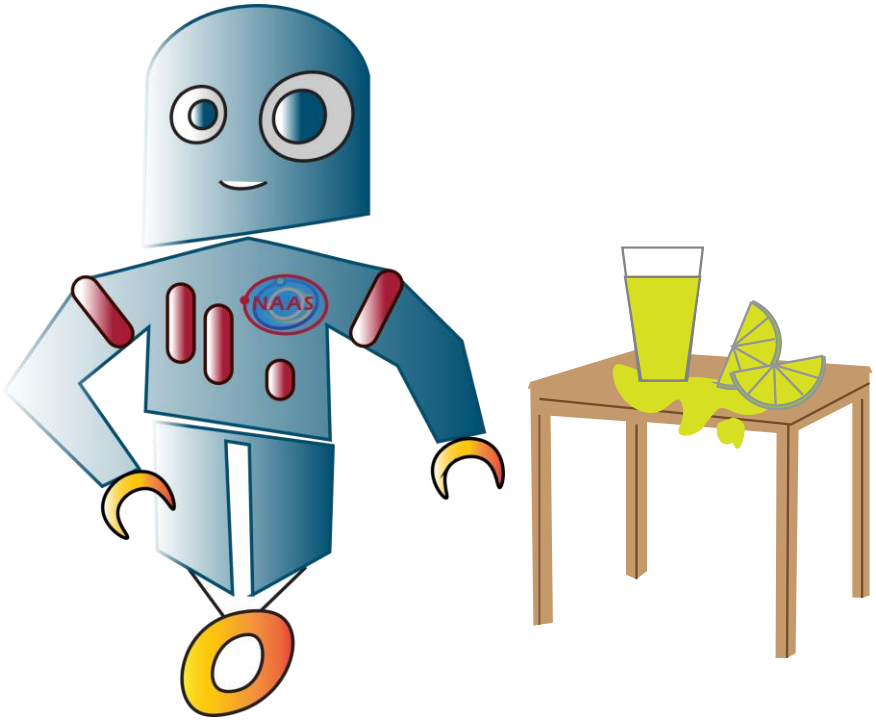
5.

6.

Activity 2

It is time to teach your robot friend to do a few things for you.

You want to have a glass of lemonade, but it is too cold for you to stand up. Sitting where you are, type the instructions on how to make a lemonade to your robot friend. Follow the same rules as in activity 1.



1.

2.

3.

4.

5.

6.

Activity 3

Is your robot up for a challenge?

Ask your robot to bring you the homework that you forgot at home. Instruct your robot how to get from the school's main gate to your classroom, then, swap your instructions with a partner and ask them to pretend to be the robot and follow your instructions. Can they reach the classroom?

1.

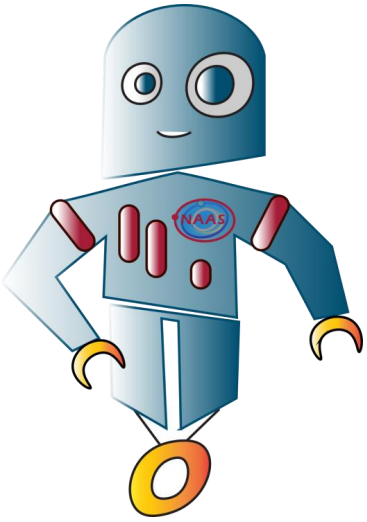
2.

3.

4.

5.

6.



Cross-curricular opportunities

Geography: You can add an extra challenge to the lesson. Your students can select a map in Digimap for Schools or another mapping tool and create paths and measurements for their peers to create the algorithm.

Numeracy: Depending on what you are teaching in Numeracy and Maths, you can use the algorithm as a starting point, you can create a number of activities. For example, students can discuss which way is longer in total, calculate the difference and between the two ways and calculate the distance if a direct line was used from the 'You' point to the final destination. They can then, display their answer as part of the next coding activity (printing messages and information).

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