

GENERATION SCIENCE

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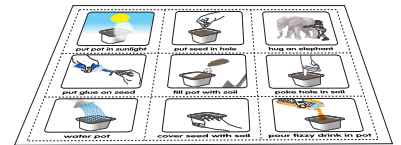
Investment managers

AT HOME ACTIVITY

Plant a seed

You will need:

- Containers for planting seed (such as empty yoghurt tubs)
- Potting soil
- Seeds (such as sunflowers)
- Water
- Plant a Seed worksheets
- Scissors
- Glue



		
put pot in sunlight	put seed in hole	hug an elephant
		
put glue on seed	fill pot with soil	poke hole in soil
		
water pot	cover seed with soil	pour fizzy drink in pot

1. Cut out the steps for planting a seed from the worksheet.

2. Work together to choose the six correct steps from the nine options.

3. Glue the six correct steps, in order, onto a separate piece of paper.

4. Trade your finished program with another group.

5. Use the program you've been given to plant your seed.

Extension

What other examples of everyday algorithms, or lists of steps, can you think of?

In teams think about the steps required to complete a task. Then share your steps with the rest of the family, without letting anyone know what the task was. Can the rest of the family guess what activity your algorithm is for?

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Explanation

An algorithm is a list of steps that you can follow to finish a task. We follow algorithms every day when it comes to activities like making the bed, making breakfast, or even getting

dressed in the morning. You can use algorithms to help describe things that people do every day.

To make a computer do anything you have to write a computer program, this program includes algorithms. To

write a computer program, you have to tell the computer, step by step, exactly what you want it to do.

The computer then "executes" the program, following each step to accomplish the end goal.

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AT HOME ACTIVITY

Getting Loopy

You will need:

- Dance Instructions
- Space for the family to move

A grown-up stands and demonstrates the dance moves below:



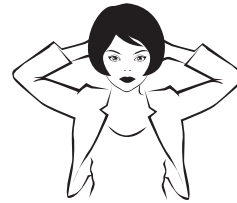
clap, clap, clap



hands behind head



hands on waist



hands behind head



hands on waist



clap, clap, clap



left hand up



right hand up



left hand up



right hand up



clap, clap, clap

x3

Repeat three times



Belly laugh

Part 2: Dance loops

1. Now show the family slowly, one instruction at a time.
2. Can you find the loop in the instructions?
3. What would the dance be like if we only repeated the main part two times? Or more?
4. Is there anything else in the dance we could use a loop for?

Extension

Give the family pictures of actions or dance moves they can do. Have the kids arrange the moves and add loops to choreograph their own dance.

Find some videos of popular dances that repeat themselves. Can you find the loops?

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Explanation

In order for computers or robots to do what we want, we have to give them a clear set of instructions. We call these instructions a program, and the computer or robot will only do what the program instructs it to. It is important to keep this set of instructions

as simple as possible, otherwise it can become very long and complicated.

One way of keeping the instructions simple is to use a loop.

In programming, a loop is a sequence of instructions that is continually

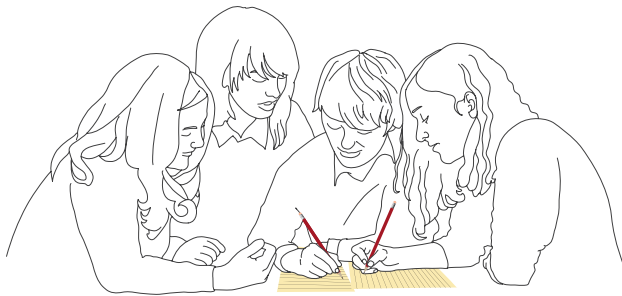
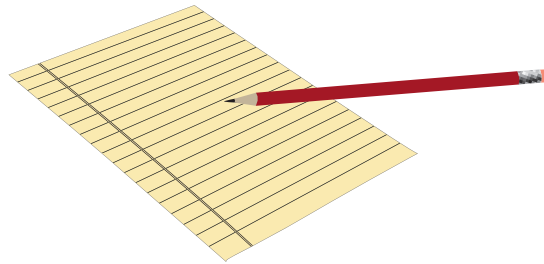
repeated until a certain condition is reached. For example, it might be to repeat a certain number of times [like clap your hands three times] or repeat until something in particular happens [like keep dancing until the music stops].

AT HOME ACTIVITY

Program a Human

You will need:

- Paper
- Pen or pencil

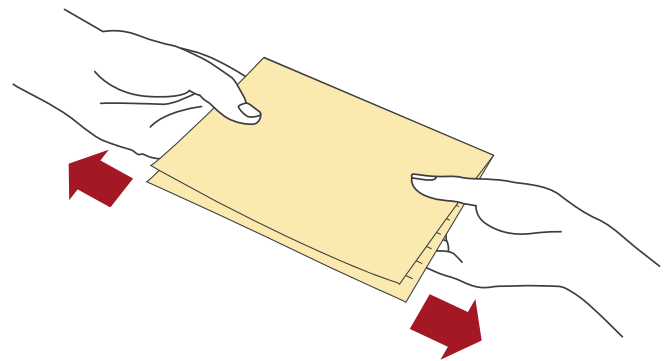


1. In a small group, think of a simple task; such as walking to the door and opening and closing it, or walking to the bin and sharpening a pencil.

2. Together, plan and write down step by step instructions (a program) for a human to complete the task as if they have never done it before.



3. Test the instructions on someone in the group. They must only move how the instructions tell them to. Can they complete the task?



4. Swap instructions with another group and see if your programme works.

**Were there more or less instructions than you were expecting?
Did you find these simple tasks simple to programme?**

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Explanation

In order for robots to move how we need or want them to, we must give them a set of instructions. We call these instructions a program, and the robot will only do what the program instructs it to. It is important to keep

this set of instructions as simple as possible, otherwise they can become very long and complicated.

It is also possible to include instructions on how the robot should react to

information gathered by its sensors. Sensors can tell robots how close they are to objects, how light or dark it is or even how much sound there is. We behave the same when we make decisions on how to move depending on what we hear, see or feel. These are called 'if/then' decisions as they are