














Programming Toys: Program a Person

Aim: Understand what algorithms are and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Children will work within the context of writing instructions to program a person. I can write instructions to program a person like a computer.	Success Criteria: I can write step-by-step instructions. I can check my work for mistakes (debug).	Resources: Lesson Pack Shoes Whiteboards Scissors
	Key/New Words: Algorithm, debug, program, turn, left, right, clockwise, anticlockwise.	Preparation: Program a Person Editable Activity Cards - 1 per pair, edited and cut up if required

Prior Learning: It would be helpful if children are familiar with directional words (left, right, half/quarter turn, clockwise, anticlockwise).

Learning Sequence

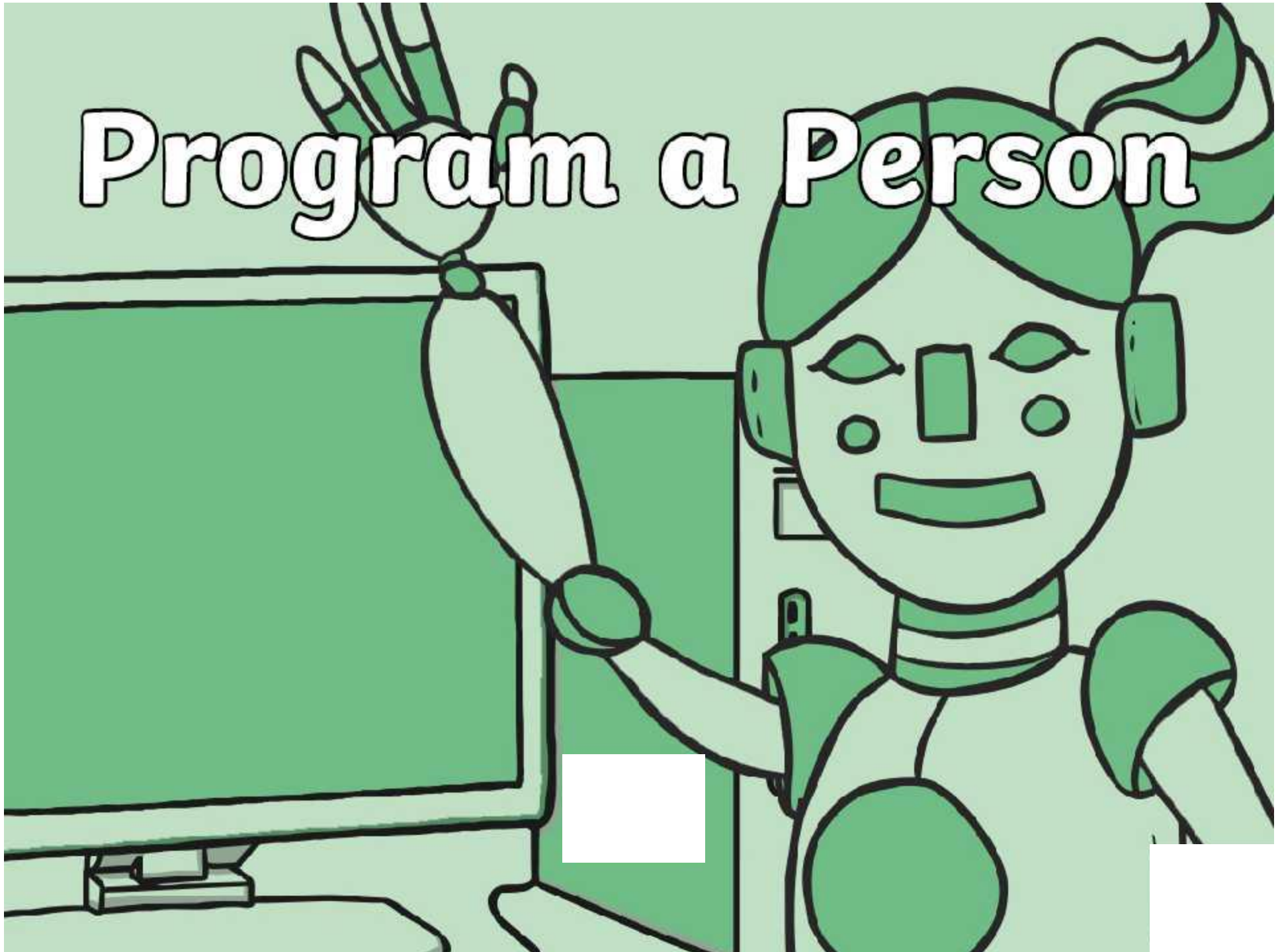
	Help Me Put My Shoes On: Show the children a pair of your shoes. Ask them to tell their partner instructions for how you should put them on. Ask some children to say their instructions out loud. Some children will correctly identify that you will need to take off the shoes you are already wearing first. Explain to them using the Lesson Presentation what this lesson will be about.	
	Program the Teacher: Allow the children in pairs to program you. Tell them that you really need to reach something on the other side of the room and bring it back to the front. In pairs, children should think of instructions for you to follow and then ask one of them to say their instructions out loud. Follow their instructions, showing the need for detail, e.g. make it clear that 'walk forward' needs to be followed by 'x number of steps', and that 'turn around' will need a direction and possibly either a 'quarter' or 'half' instruction. <i>Can children give precise instructions that someone else can follow?</i>	
	Debugging: Explain to the class that if they notice something has gone wrong, they must go back and change the algorithm. Show the next slide on the Lesson Presentation and ask the children to identify where the instructions need fixing. Repeat for the following slides. <i>Can children work out the mistakes? Can children correct a mistake?</i>	
  Children follow instructions involving moving around the room to fetch objects.  Children follow instructions asking them to move in more precise ways and use simple objects.  Children follow instructions including moving and using objects which may have more than one way of interacting with them.	Program Your Friend! Get the children into pairs of similar ability and tell them that they will take it in turns to be a toy robot! Each pair has a set of Program a Person Activity Cards which they must work through. One child should pick a card and attempt to instruct their partner, step by step, to complete the task. Ensure that as children are working, they make a written record of at least one set of instructions that was successful. You may wish to take photographs or videos of the children working together. <i>Can children give precise instructions that someone else can follow?</i>	
	Algorithms Without Words: Ask the children how you could write an algorithm without words. Show them the symbols on the Lesson Presentation and ask them to draw which symbols they would have to draw to get you, the teacher, to a different part of the room. Tell them that they will also need to tell you how many steps or turns to take, using a number of arrows. <i>Can children use simple symbols to represent a single action?</i>	

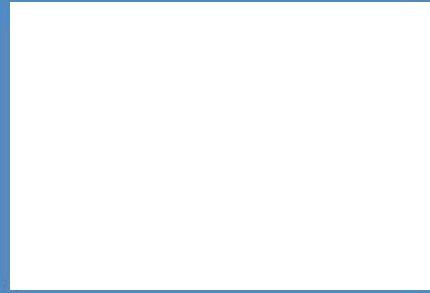
Taskit

Challengeit: Can a child, with an adult, direct a friend to complete a task, without them knowing what it is?

Askit: Can you think of a task which could have different algorithms for the same job? For example, how many ways are there to get to our classroom door?

Program a Person





Computing

Programming Toys

Aim

- I can write instructions to program a person like a computer.

Success Criteria

- I can write step-by-step instructions.
- I can check my work for mistakes (debug).

Help Me Put My Shoes On



How do I put these shoes on?
Tell your partner instructions for how I
should put my shoes on.

Help Me Put My Shoes On



Did it work?

Did you make sure that I took off my old shoes first?

What would happen if I forgot to take them off first?

Sometimes, a computer can only follow an instruction if something else has already happened.

Can you think of any other tasks that have to be done in a certain order?

Help Me Put My Shoes On



What tasks did you think of?

Think about:

Computers work this way too – everything needs to be done in the right order.

What if you forgot to take off your normal clothes first?



What if you didn't get out a bowl before you poured the milk?



Program the Teacher!



Can you program me?
What kind of instruction words will you use?



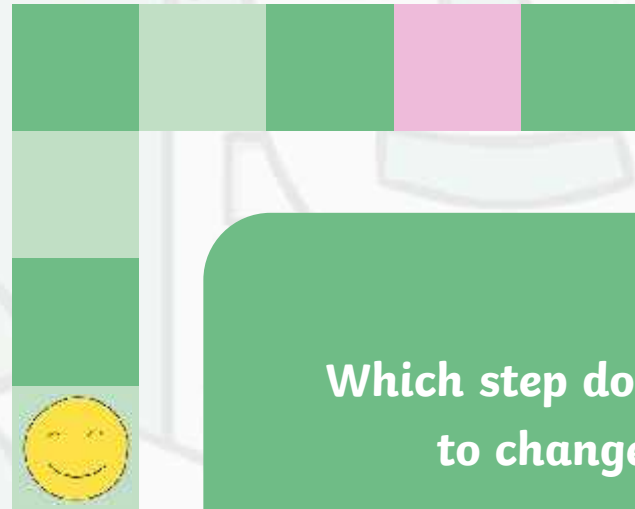
Debugging



Uh oh! I'm trying to write an algorithm to get the smiley face to the pink square, but I can't seem to get there.

To get to the pink square:

1. Move forward 3 squares.
2. Turn a quarter turn clockwise.
3. Move forward 4 squares.



Which step do I need to change?

Debugging



Uh oh! I'm trying to write an algorithm to get the smiley face to the pink square, but I can't seem to get there.

To get to the pink square:

1. Move forward 3 squares.
2. Turn a quarter turn clockwise.
3. Move forward **3** squares.



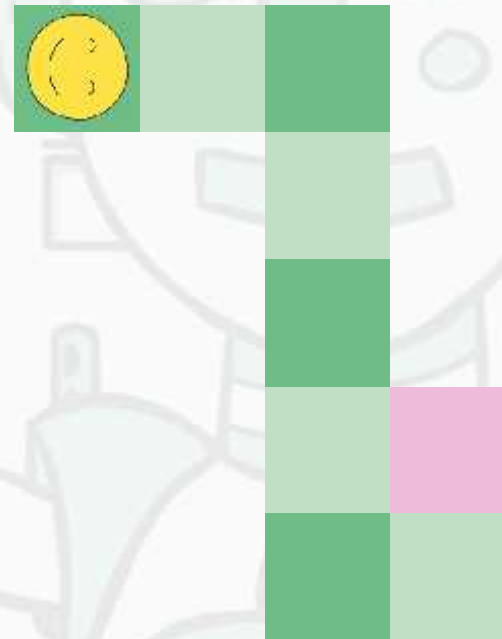
Which step do I need to change?

Debugging



To get to the pink square:

1. Move forwards 2 squares.
2. Turn a quarter turn clockwise.
3. Move forward 4 squares.
4. Turn a quarter turn anticlockwise.
5. Move forward 1 square.

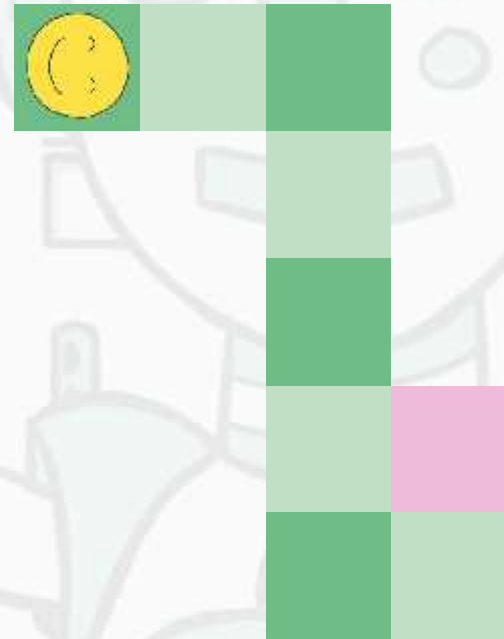


Debugging



To get to the pink square:

1. Move forwards 2 squares.
2. Turn a quarter turn clockwise.
3. Move forward **3** squares.
4. Turn a quarter turn anticlockwise.
5. Move forward 1 square.



Debugging



To get to the pink square:

1. Move forward 4 squares.
2. Turn a quarter turn clockwise.
3. Move forward 1 square.
4. Turn a quarter turn anticlockwise.
5. Move forward 1 square.
6. Turn a quarter turn anticlockwise
7. Move forward 1 square.



Debugging



To get to the pink square:

1. Move forward **3** squares.
2. Turn a quarter turn clockwise.
3. Move forward 1 square.
4. Turn a quarter turn anticlockwise.
5. Move forward **2** squares.
6. Turn a quarter turn anticlockwise
7. Move forward 1 square.



Program Your Friend!



Your friend is now a toy robot! Your job is to get them to do the tasks on the cards.

Remember, you have to tell them exactly how to do each step.

Which words will you need to use?

steps

turn

right

sidestep

half

left

backwards

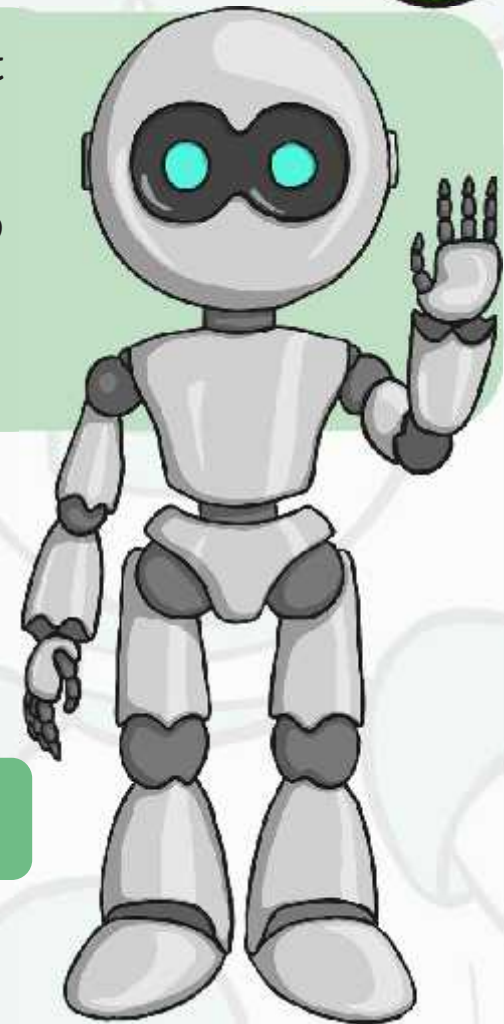
forward

quarter

clockwise

anticlockwise

three-quarters



Algorithms Without Words



What if we couldn't use words to program our robot? How else could we give it instructions?

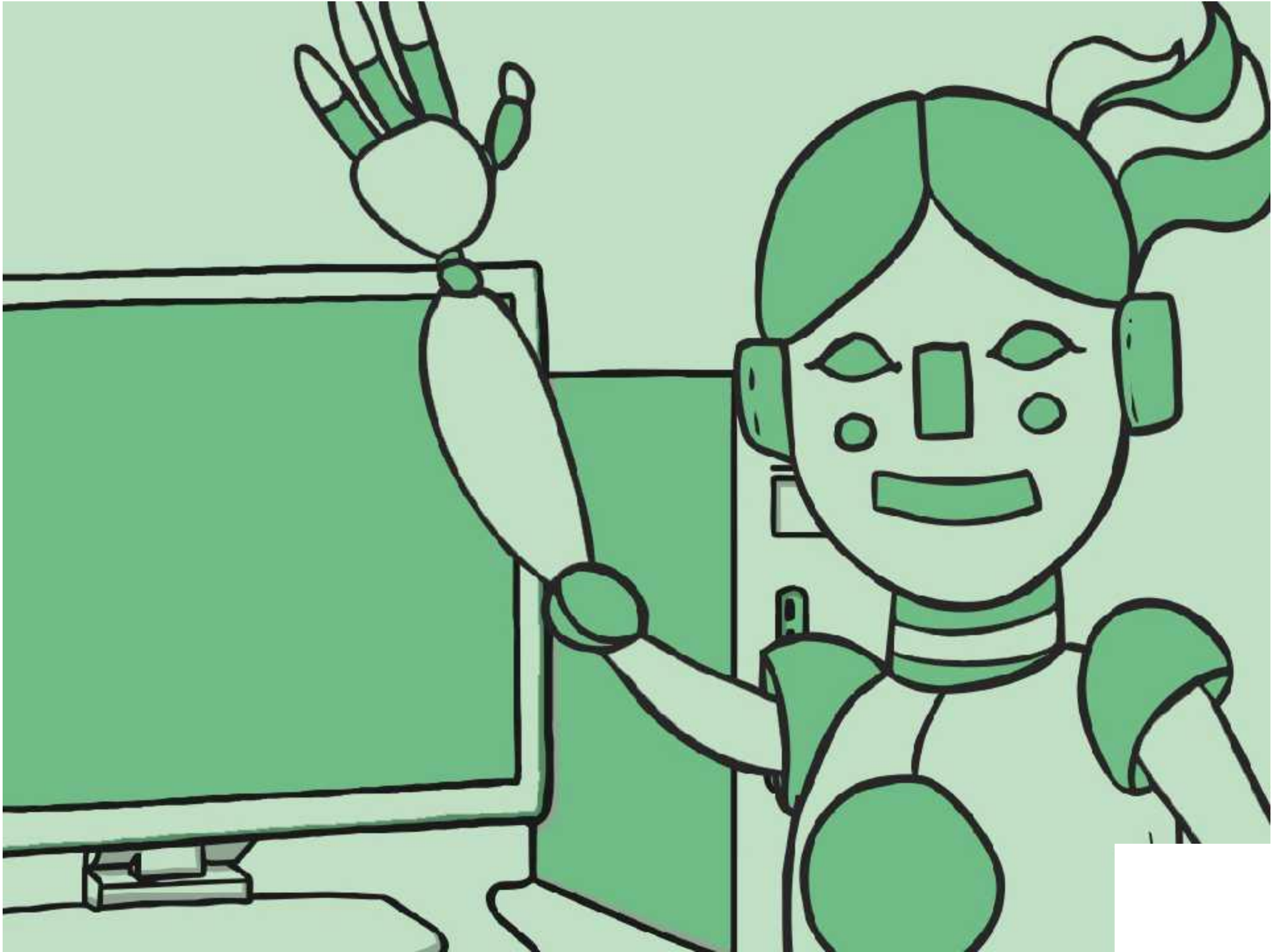


Aim

- I can write instructions to program a person like a computer.

Success Criteria

- I can write step-by-step instructions.
- I can check my work for mistakes (debug).



Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		

Programming Toys | Program a Person

I can write instructions to program a person like a computer.		
I can write step-by-step instructions.		
I can check my work for mistakes (debug).		



Program a Person Cards

Your job is to get your robot partner to:

Walk to a door.	Stand by the teacher's desk.	Sit down on someone else's chair.
Pick up a pencil.	Walk to the bin.	Crouch down next to the window.
Kneel next to a cupboard.	Lie down on the carpet.	Stand with their back to the window.



Program a Person Cards

Your job is to get your robot partner to:

Open a door.

Stand by the teacher's desk
with their hands in the air.

Sit down on someone else's
chair.

Pick up a pencil.

Pick up a pencil and put it
down somewhere else.

Crouch down next to the
window.

Jump!

Open a book.

Stand with their back to
the window.



Program a Person Cards

Your job is to get your robot partner to:

Open a door.

Stand by the teacher's desk
and wave their hands.

Sit down on 3 different
chairs.

Draw a circle and a line in
the air with their finger.

Pick up a pencil and put it
down somewhere else.

Crouch down next to the
window.

Jump!

Can you do this without
saying the word 'jump'?

Bring a book to you and
open it.

Stand with their back to
the window, holding a
ruler.



Program a Person Cards

Your job is to get your robot partner to:

Walk to a door.

Stand by the teacher's
desk.

Sit down on someone
else's chair.

Pick up a pencil.

Walk to the bin.

Crouch down next to
the window.

Kneel next to a cupboard.

Lie down on the carpet.

Stand with their back to
the window.



Program a Person Cards

Your job is to get your robot partner to:

Open a door.

Stand by the teacher's
desk with their hands in
the air.

Sit down on someone
else's chair.

Pick up a pencil.

Pick up a pencil and put
it down somewhere else.

Crouch down next to the
window.

Jump!

Open a book.

Stand with their back to
the window.



Program a Person Cards

Your job is to get your robot partner to:

Open a door.

Stand by the teacher's desk and wave their hands.

Sit down on 3 different chairs.

Draw a circle and a line in the air with their finger.

Pick up a pencil and put it down somewhere else.

Crouch down next to the window.

Jump!
Can you do this without saying the word 'jump'?

Bring a book to you and open it.

Stand with their back to the window, holding a ruler.