

Play Code Learn

DINOSAUR COMMANDS



Lesson Two:
Writing clear & precise algorithms

Lesson Two Learning Outcomes

Learning Intention:

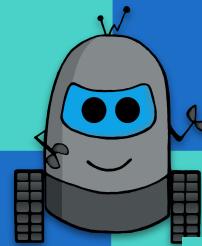
...how to create a clear & precise sequential algorithm.

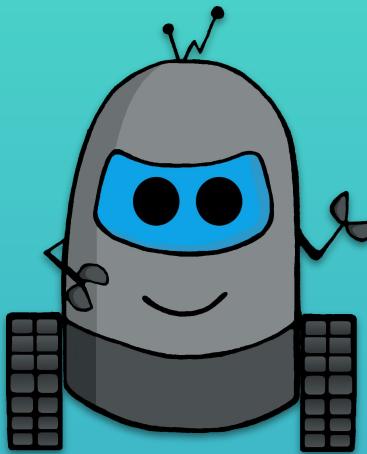
To use
algorithmic
thinking.

To write and
give step by
step
algorithms.

To use
decomposition
to plan the
task.

To follow,
test and debug
algorithms.





Hardware: Inputs & Outputs

Discussion: Inputs & outputs

A technological system can be shown with a systems diagram:



An **input** is something that is put into a system.

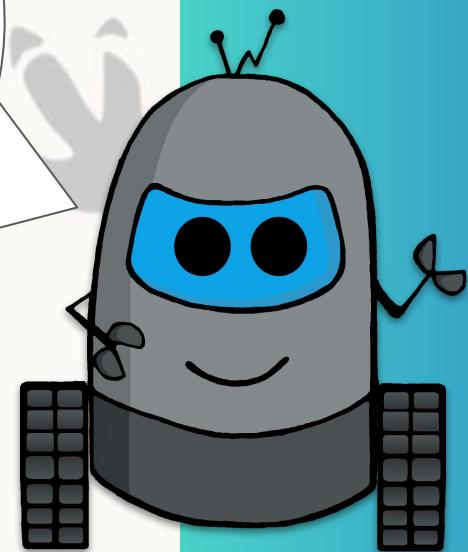
An **output** is something that comes out of a system.

Discussion: Inputs & outputs

Think of a technological system, e.g. a bicycle, a toaster, a torch.

What are the inputs for this system?

What are the outputs for this system?

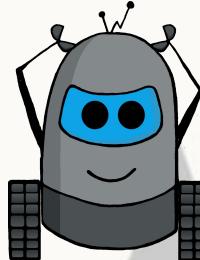


Activity: Head, Stand, Toes

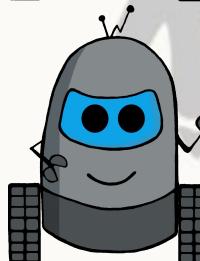


One the next few slides you will find images of digital hardware used in computer science.

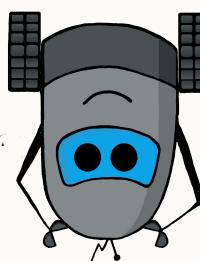
When the image pops up you have 10 seconds to make a decision!



Put your hands on
your head



Stand up



Put your toes in
the air

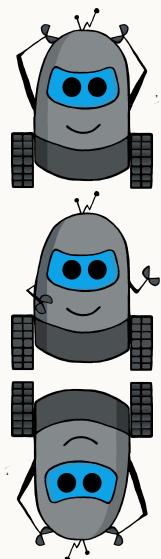
INPUT

OUTPUT

BOTH

Activity: Head, Stand, Toes

Headphones



INPUT

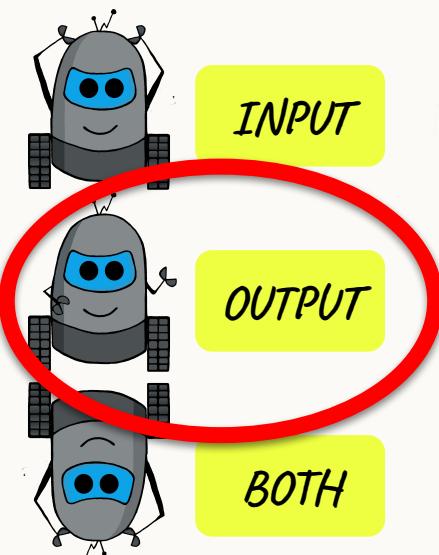
OUTPUT

BOTH



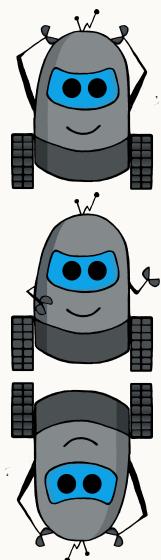
Activity: Head, Stand, Toes

Headphones



Activity: Head, Stand, Toes

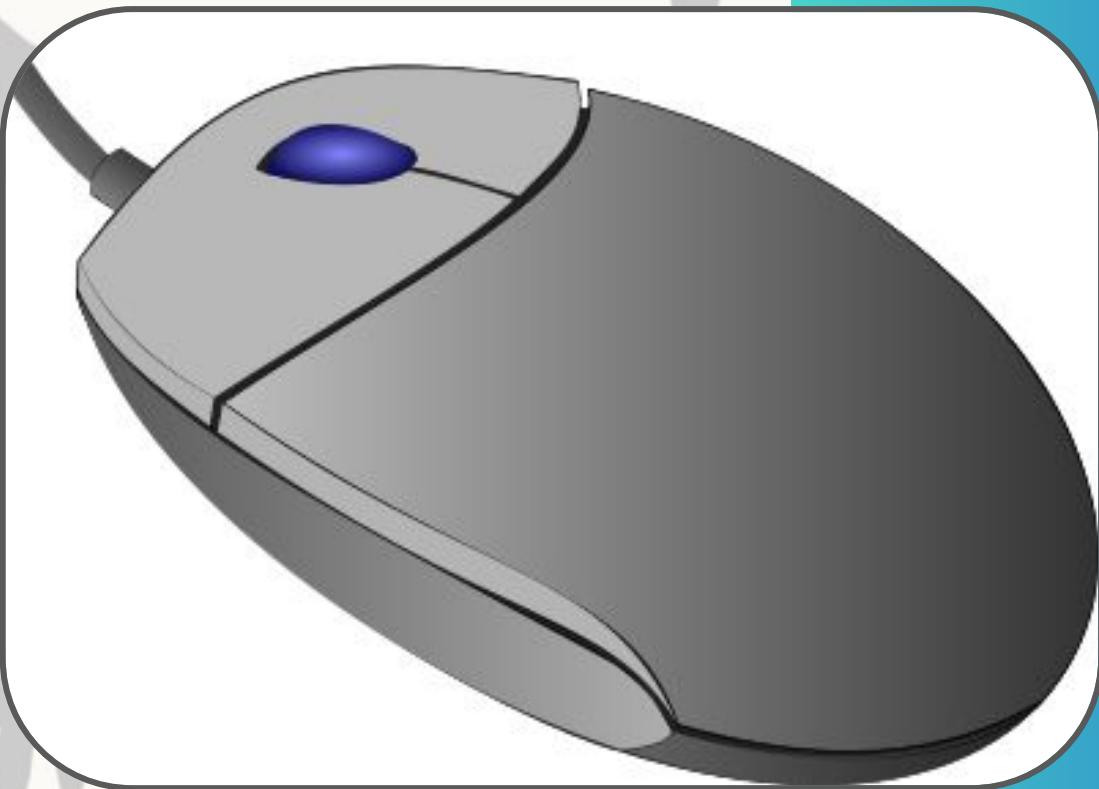
Computer
Mouse



INPUT

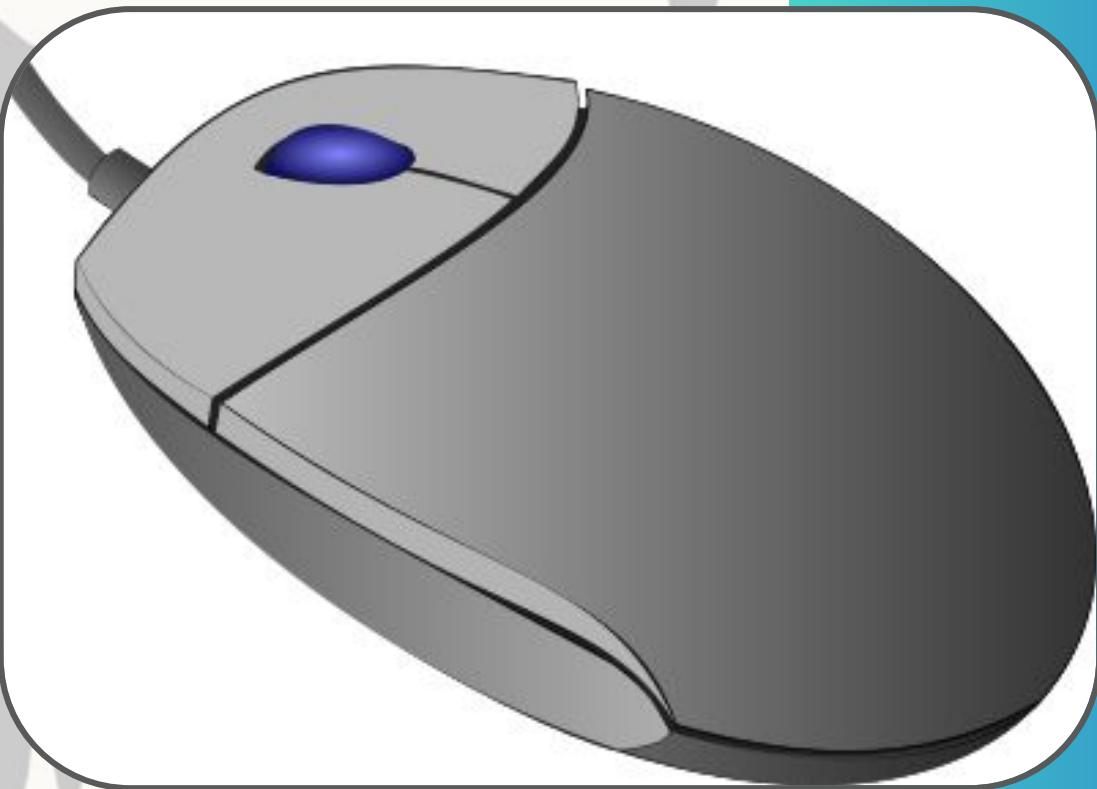
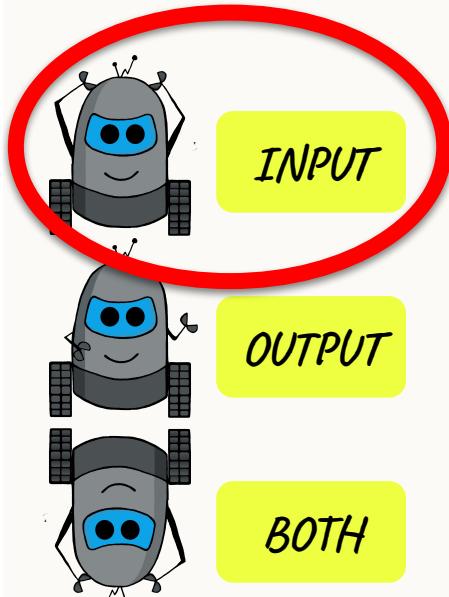
OUTPUT

BOTH



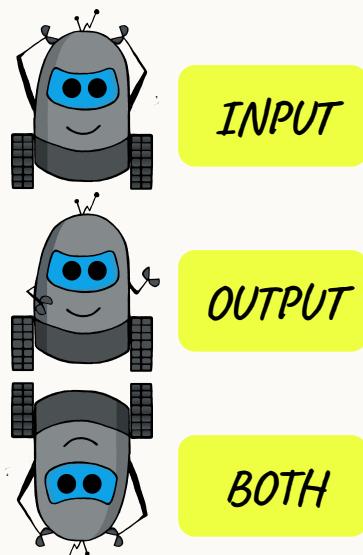
Activity: Head, Stand, Toes

Computer
Mouse



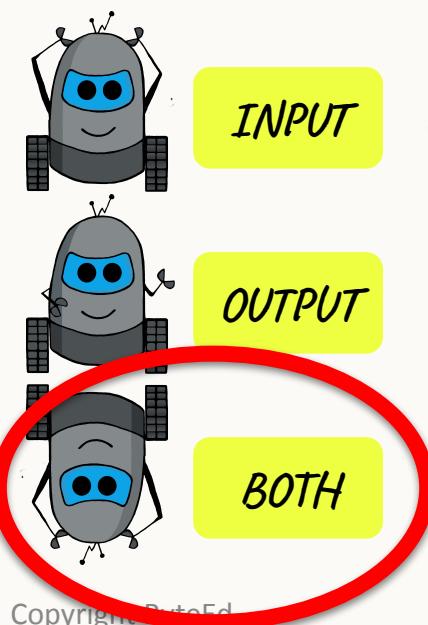
Activity: Head, Stand, Toes

Tablet



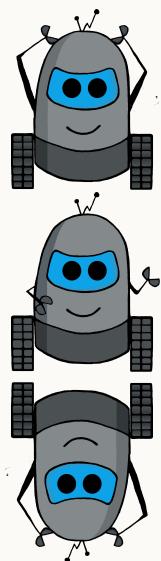
Activity: Head, Stand, Toes

Tablet



Activity: Head, Stand, Toes

Printer



INPUT

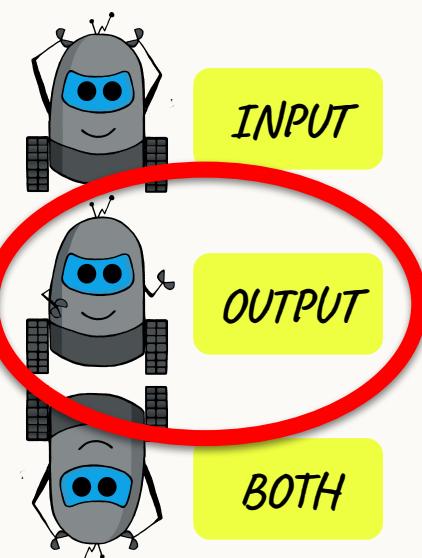
OUTPUT

BOTH



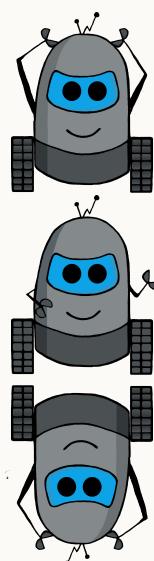
Activity: Head, Stand, Toes

Printer



Activity: Head, Stand, Toes

Keyboard



INPUT

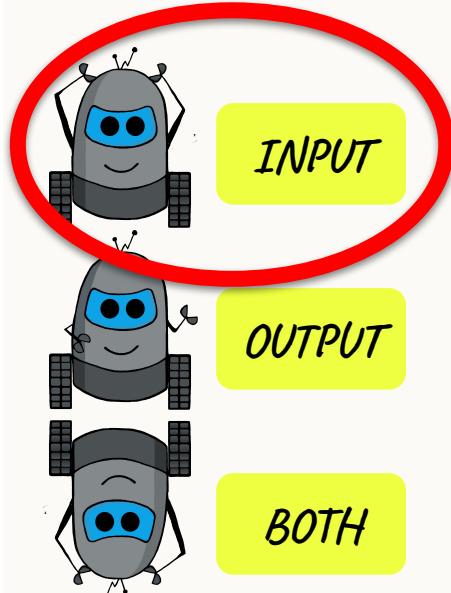
OUTPUT

BOTH



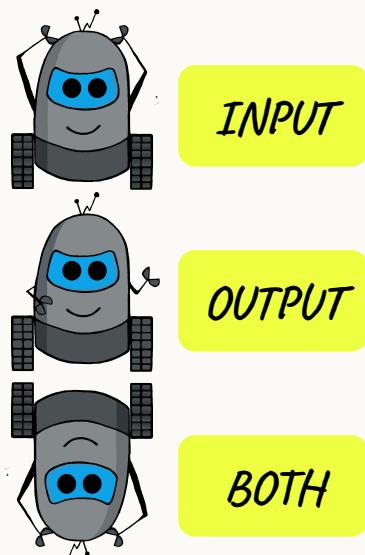
Activity: Head, Stand, Toes

Keyboard



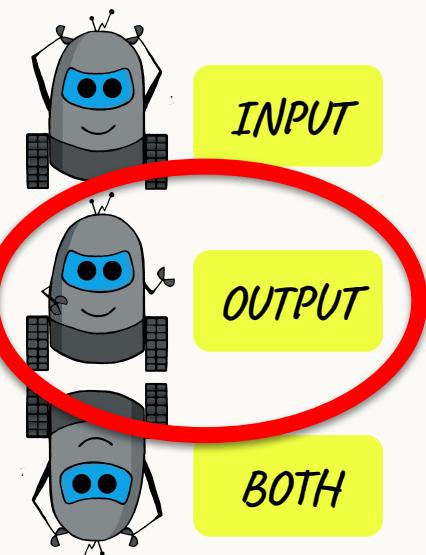
Activity: Head, Stand, Toes

3D printer



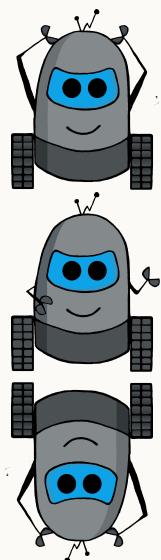
Activity: Head, Stand, Toes

3D printer



Activity: Head, Stand, Toes

VR Headset



INPUT

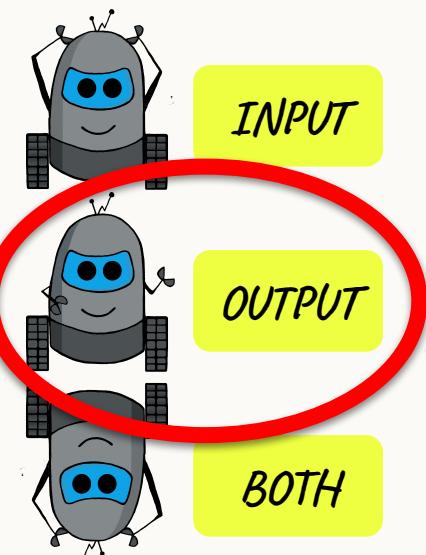
OUTPUT

BOTH



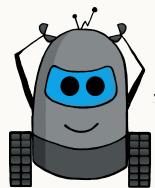
Activity: Head, Stand, Toes

VR Headset

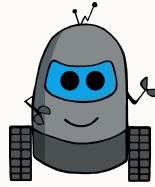


Activity: Head, Stand, Toes

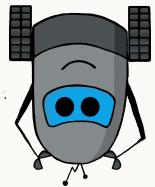
Digital
Camera



INPUT



OUTPUT

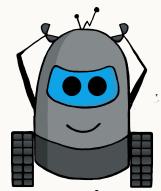


BOTH

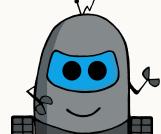


Activity: Head, Stand, Toes

Digital
Camera



INPUT



OUTPUT

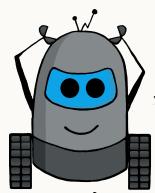


BOTH

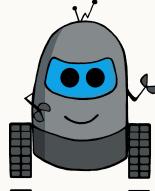


Activity: Head, Stand, Toes

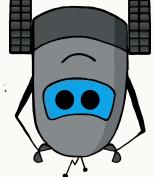
USB
Flash drive



INPUT



OUTPUT

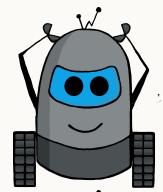


BOTH

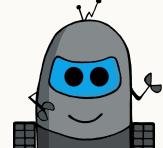


Activity: Head, Stand, Toes

USB
Flash drive



INPUT



OUTPUT

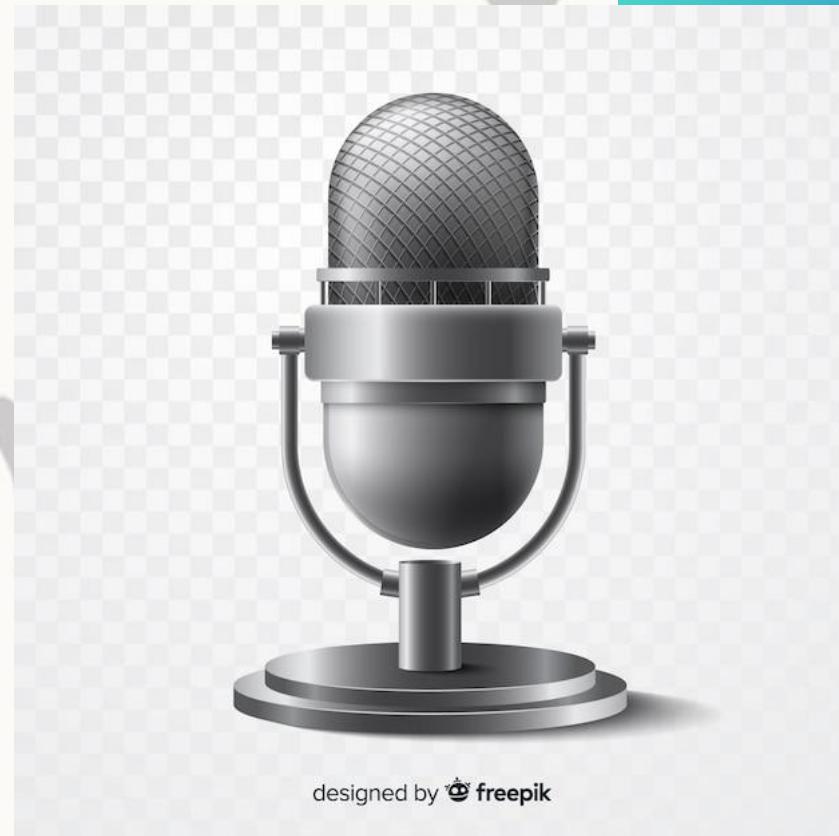
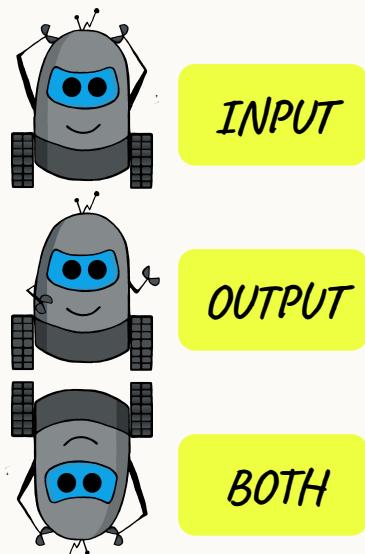


BOTH



Activity: Head, Stand, Toes

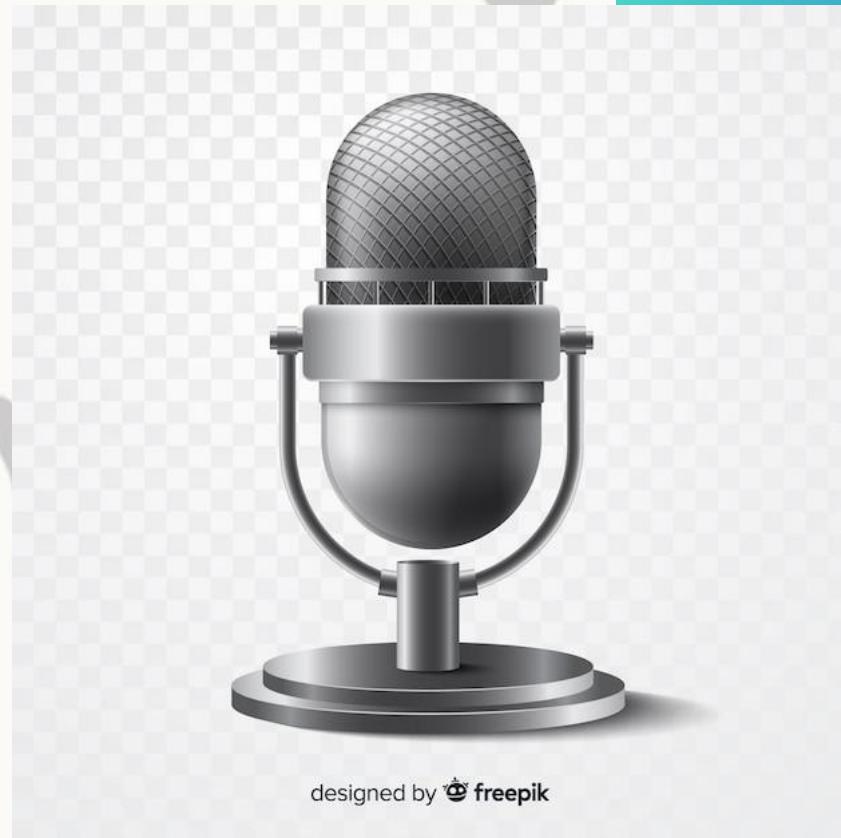
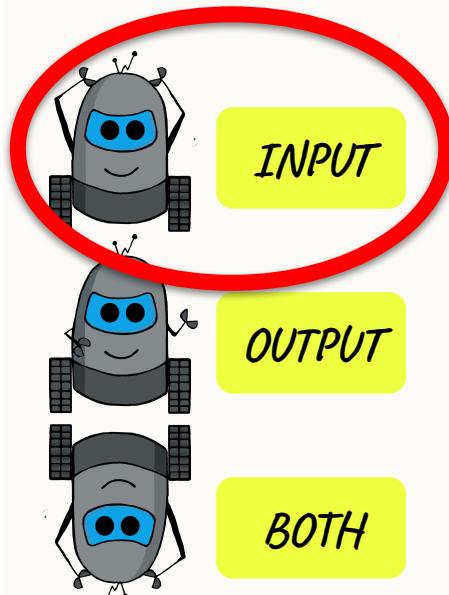
Microphone



designed by  freepik

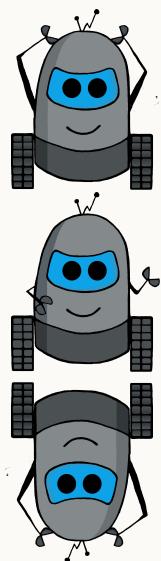
Activity: Head, Stand, Toes

Microphone



Activity: Head, Stand, Toes

Monitor



INPUT

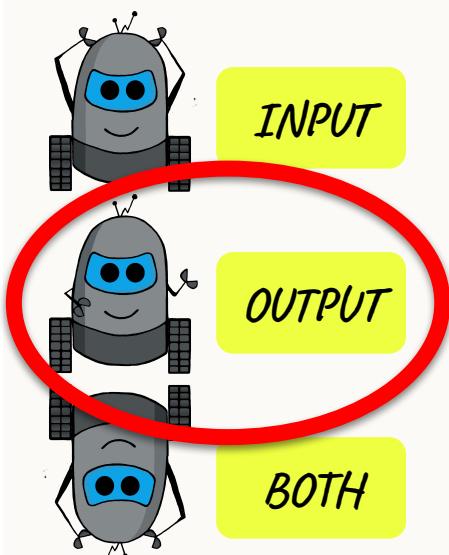
OUTPUT

BOTH



Activity: Head, Stand, Toes

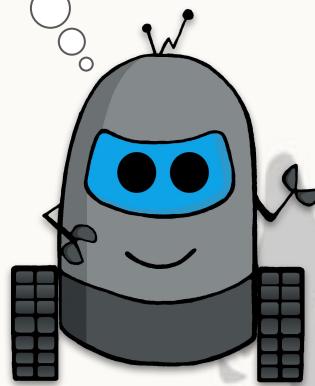
Monitor



Discussion: Inputs & Outputs



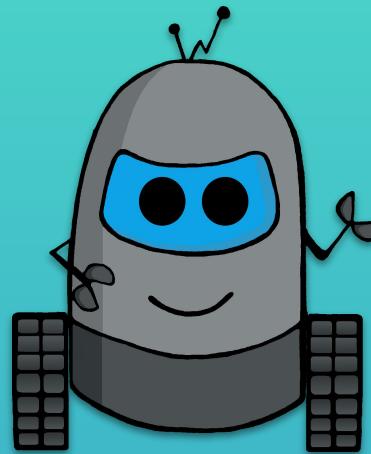
How did you do?



*Were there any that were difficult
to decide on?*

*Can you think of any other types of hardware
that can be used with computers?*

Are they Inputs? Outputs? Or both?



Sequential instructions & algorithms

Sequential instructions

Activity: Logical Cuts

Dinosaur puzzles

Choose a geometric dinosaur puzzle.

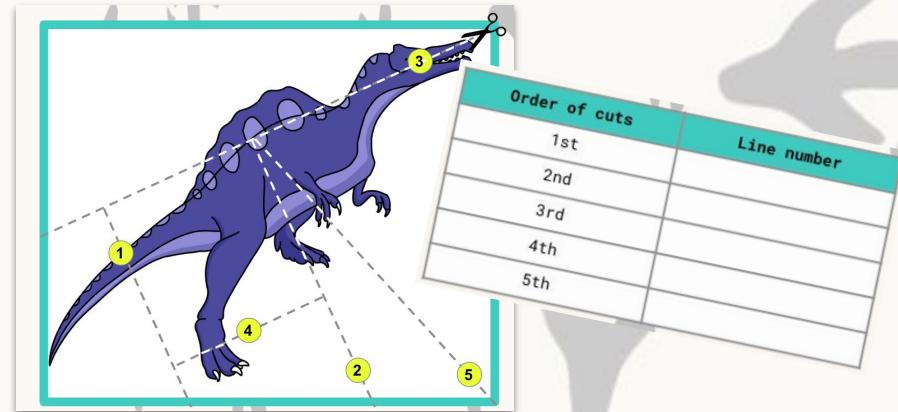
You are going to cut it out using straight cuts (*no corner turning!*)

Before you cut it out you need to think carefully about which line to cut along first, second, third, etc.

If you choose the wrong line you may end up cutting through a puzzle piece!

Plan the cuts, then **follow your instructions** and cut it out.

Check for any **errors** and debug the instructions (**algorithm**).



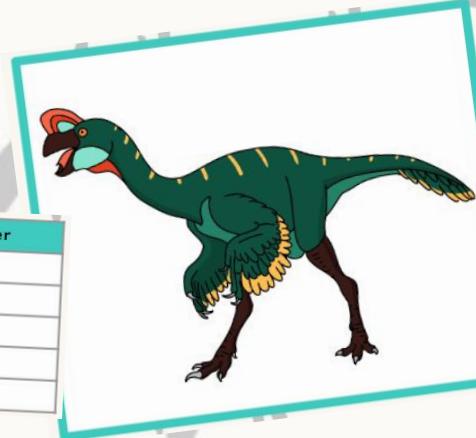
Sequential instructions

Extension Activities: Logical Cuts

Dinosaur puzzles

Want to take this a bit further?

Order of cuts	Line number
1st	
2nd	
3rd	
4th	
5th	



Why not make your own dinosaur puzzle?

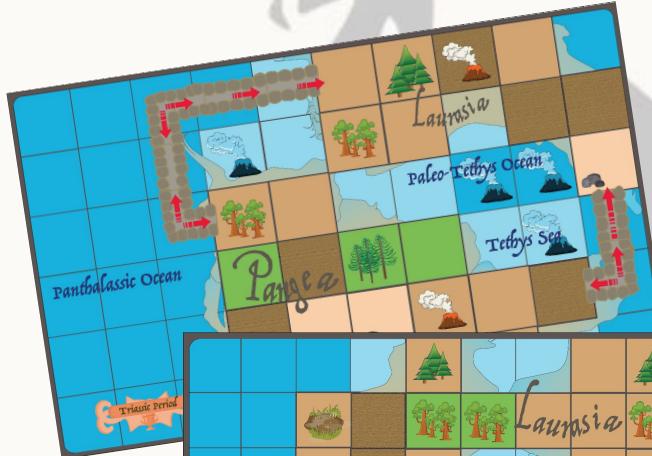
Plot the cut lines on the dinosaur image and then write the instructions to cut it out in a logical order. Get a partner to test it out for you!

Or, can you figure out how many different ways an *instructional algorithm* can be written for one of the puzzles?

There is usually more than one correct answer - can you figure them out and write them down?

Sequential instructions

Activity: Dinosaur Commands



Triassic period (easier)



Jurassic period (medium)

Cretaceous period (harder)



Then, get all of the cards ready...



It's your turn to practise writing **sequential instructions** with the Dinosaur Commands kit!

Start by choosing a map of a dinosaur period.

Sequential instructions

Activity: Dinosaur Commands



Use the Dinosaur Commands booklet to help to teach you how to write **sequential instructions** using the Dinosaur Commands kit.

Pages 4 to 8 will tell you what to do.



Play Code Learn

Play Code Learn: Dinosaur Commands

Sequential instructions

Activity: Dinosaur Commands

To be successful when writing **sequential instructions**, you need to:

- **Break the task down** into small parts - this is called **decomposition** (de-com-po-si-shun) in computational thinking.
- **Decide** on an origin and destination.
- **Plot** the path using the footprints.
- **Use** clear **sequential** step by step instructions.
- When ready to try the **instructions**, place the run card at the top.



Hint: Remember there may be more than one solution to the problem!



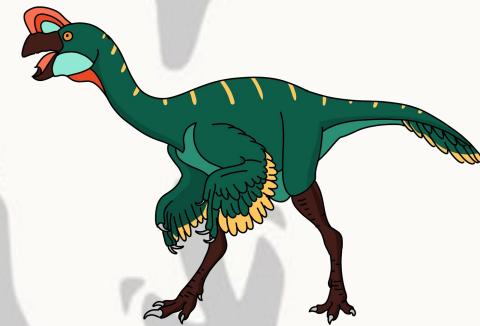
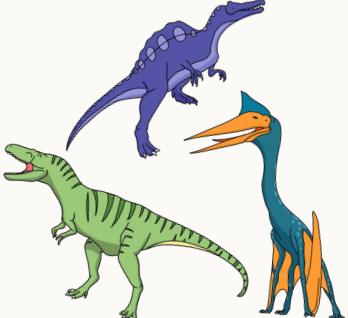
Sequential instructions

Activity: Dinosaur Commands



Beginner - Use the arrow cards to write **instructions** to get Explorer Ed from the start flag to the finish flag. Use the triassic game board.

Intermediate - Use the arrow cards to write **instructions** to get Explorer Ed from the start flag to the finish flag, visiting at least one dinosaur along the way. Use the Jurassic map.



Advanced - Use the arrow cards to write **instructions** to get Explorer Ed from the start flag to the finish flag, visiting 3+ dinosaurs along the way. Use the Cretaceous period map.

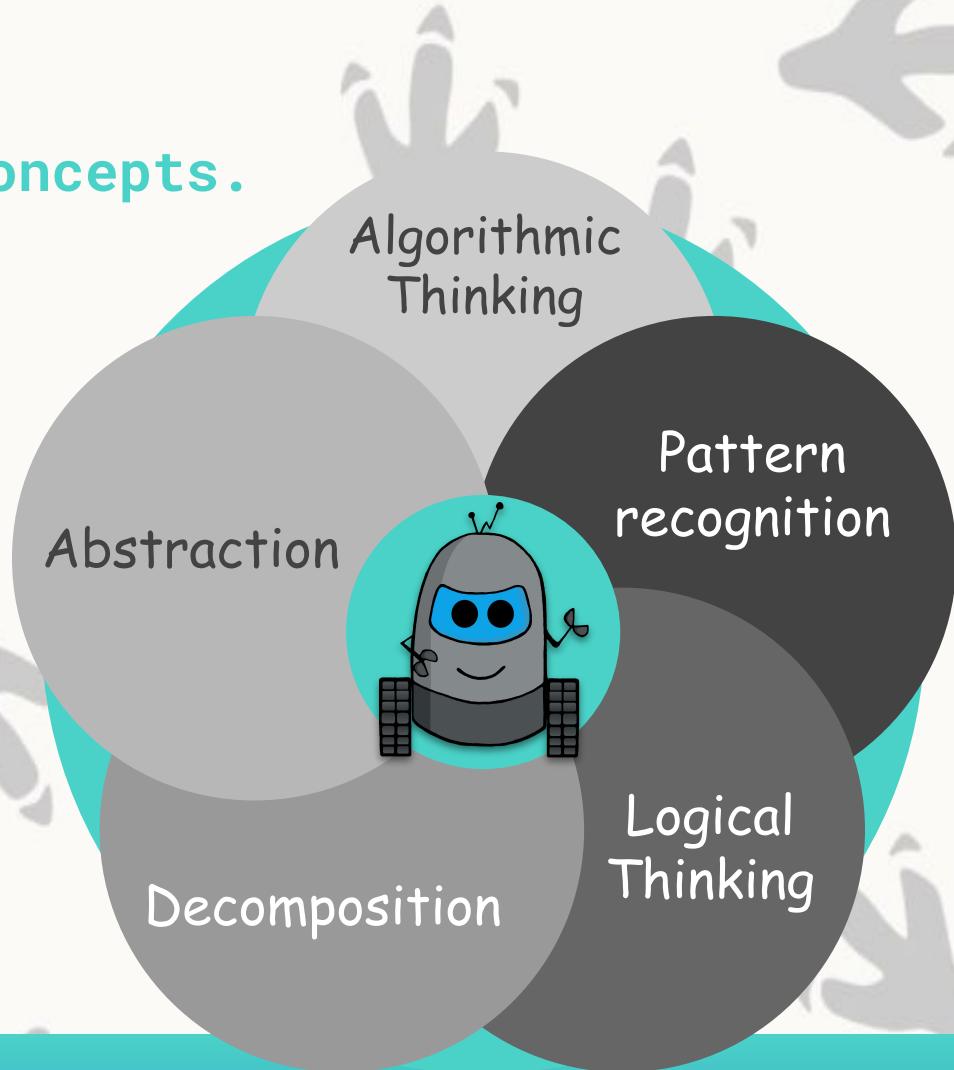
Test and trial the instructions - *was Explorer Ed successful?*

Sequential instructions

Computational Thinking Concepts.

Today you have explored how to write clear & precise **sequential instructions**.

Which computational thinking concept do you think this links to?

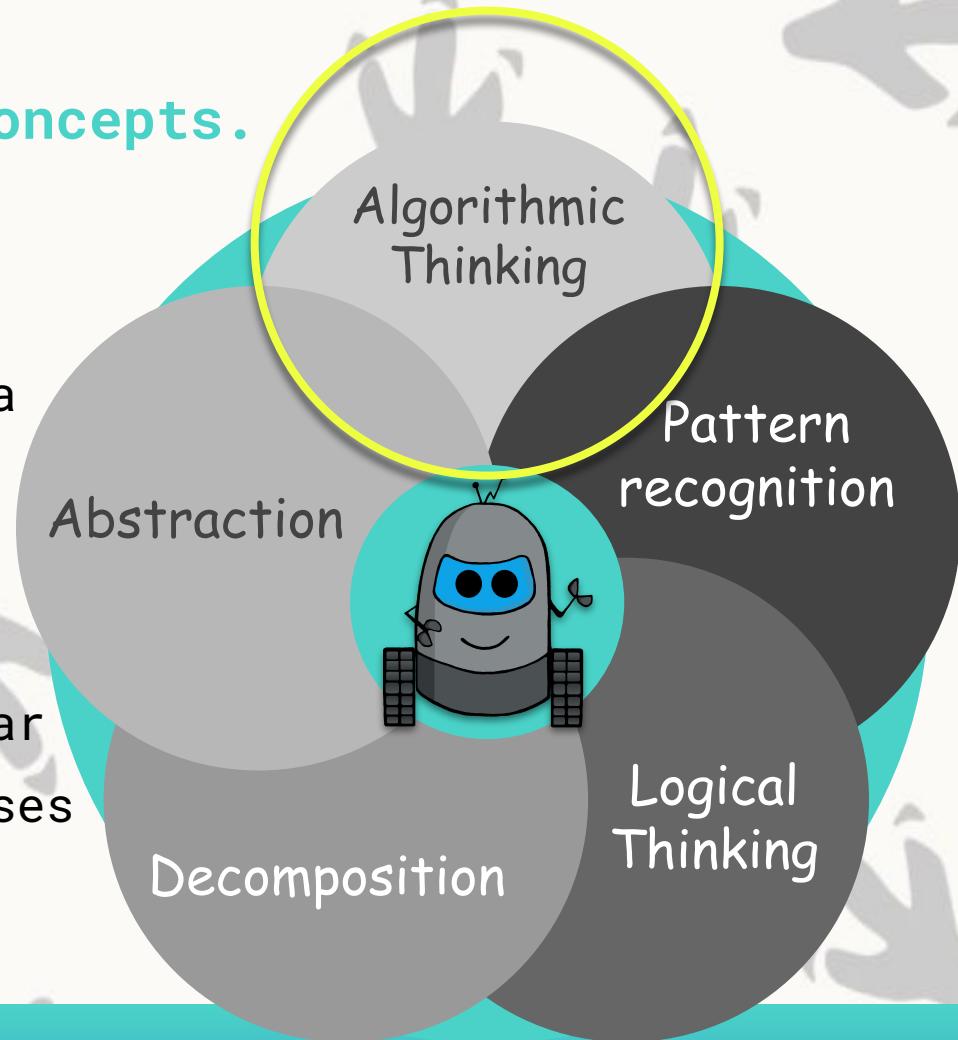


Sequential instructions

Computational Thinking Concepts.

Sequential instructions are a very important when writing **algorithms**.

An **algorithm** is a set of clear instructions that a humans uses to help to develop computer programs.



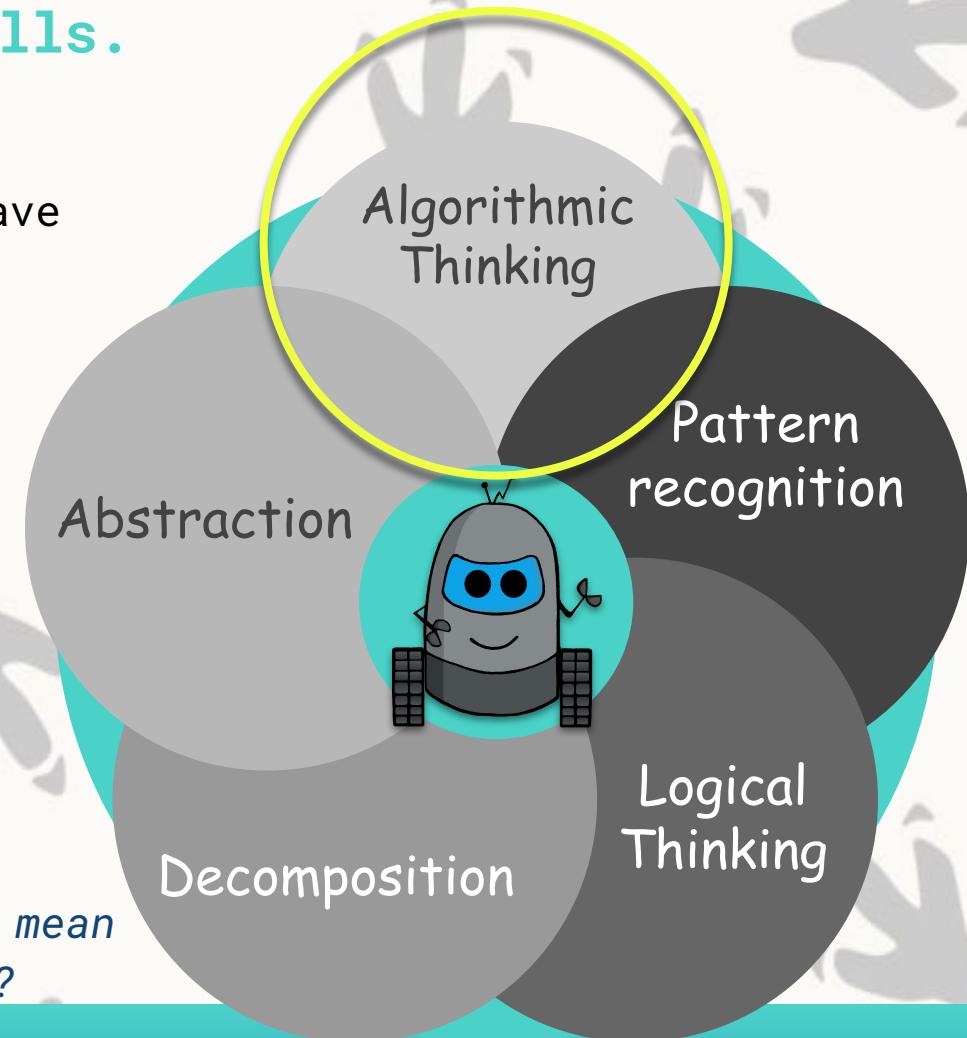
Sequential instructions

Algorithmic Thinking skills.

When completing the tasks you have practised these skills:

- Writing algorithms
- Logical order
- Spotting errors (bugs)
- Debugging
- Using commands
- Using inputs and outputs
- Decomposition

Can you explain what these terms mean and how you have used them today?



Extension Activity

Dinosaur Decomposition

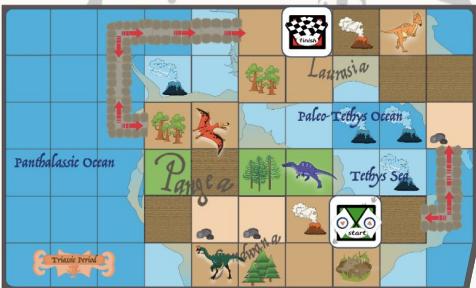
Look at the pre-made boards.

How would you break down the task for Explorer Ed **before** you write the actual algorithm?

i.e. what would you do first, second, third, fourth, etc?

Decomposition - breaking down algorithms

Look at the example on the Triassic period board. Decompose and plan the movements for Explorer Ed to travel from start to finish, visiting every dinosaur along the way!
(To make it more difficult you are not allowed to use the water squares!)



Order	Action
1st	Start to...
2nd	to
3rd	to
4th	to
5th	... to finish!

Copyright ByteEd

Play Code Learn: Dinosaur Commands

Decomposition - breaking down algorithms

Look at the example on the Jurassic period board. Decompose and plan the movements for Explorer Ed to travel from start to finish, visiting every dinosaur along the way!
(To make it more difficult you are not allowed to use the water squares!)



Order	Action
1st	Start to...
2nd	to
3rd	to
4th	to
5th	... to finish!

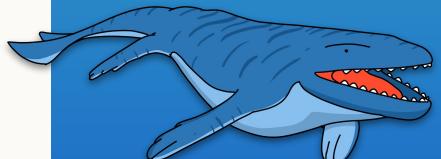
Copyright ByteEd

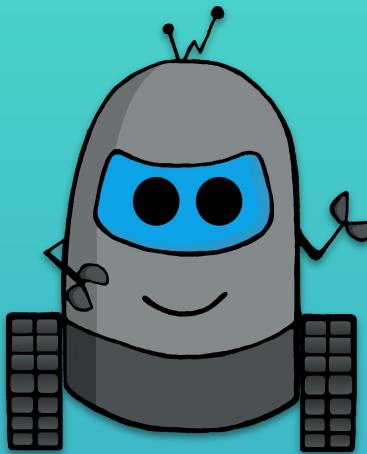
Play Code Learn: Dinosaur Commands

Order	Action
1st	Start to...
2nd	to
3rd	to
4th	to
5th	... to finish!

Copyright ByteEd

Play Code Learn: Dinosaur Commands





Reflection

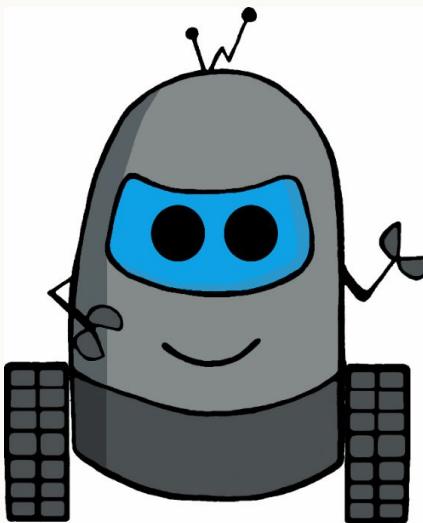


Reflection: Lesson Two

Learning Intention:

...how to create a clear & precise sequential algorithm.

How do you feel about today's lesson?



What were the key takeaways from the lesson today?

What would you like to learn more about?

Play Code Learn

Thank you!

