This activity is for: Years 5-6

Wombot: Carrot Hunt

This activity teaches…

We use algorithms to solve all sorts of problems around us. Algorithms are sequences of steps, or procedures, that lead us from a starting position to a goal. Some algorithms can be described easily (think about the recipe for making a cake), whilst others are harder to describe (think about a Sudoku puzzle).

The algorithm in this activity is somewhere between a cake recipe and a Sudoku puzzle: there are some procedural steps, and a bit of trial and error.

It is targeted towards students in years 5 to 6 and is expected to take up to **60 minutes**.

You will need…

Printouts of the Wombot grid.

Getting started (read this with your child):

Wombot is very upset: **five delicious carrots have gone missing!**
A bunch of Wombot's friends have joined in the carrot hunt — can you help?

Each Wombot is looking forwards and to each side to look for the carrots, and each of them can see some of the carrots, or none. Your job is to work out where the five carrots are!

See a demonstration

cmp.ac/carrothuntvid

This page is for Students

Wombot: Carrot Hunt

Oh no! Wombot has lost five delicious carrots!
Wombot's friends have joined in the hunt, and they need help!

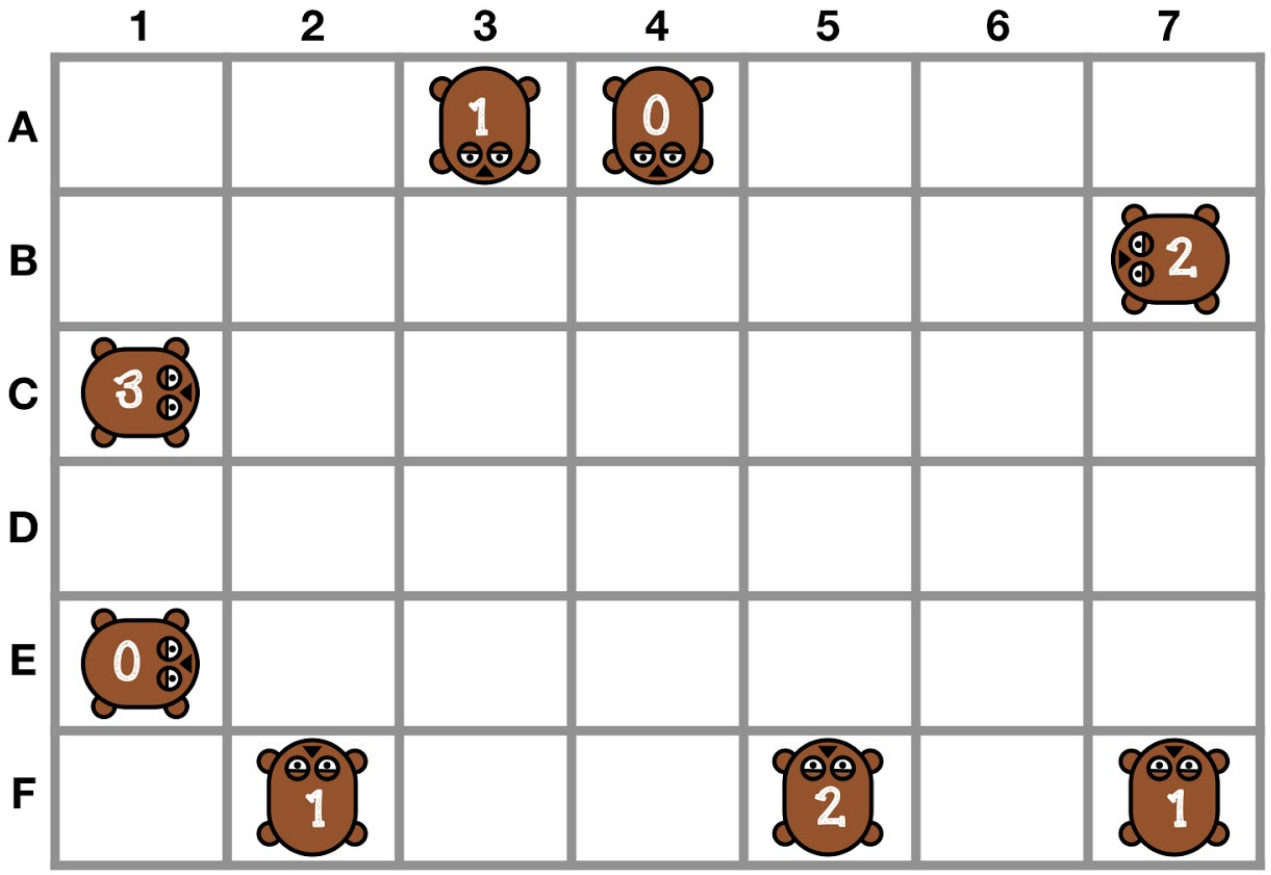


Image: Credit Australian Computing Academy, University of Sydney

Wombot: Carrot Hunt

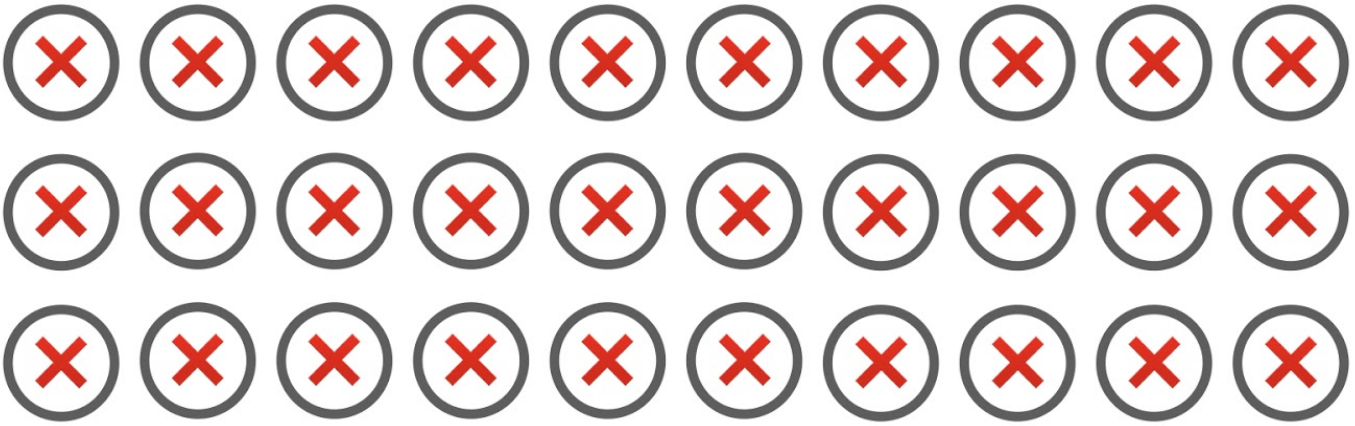
Students

Oh no! Wombot has lost five delicious carrots!
Wombot's friends have joined in the hunt, and they need your help!

Preparation:
Cut out the five carrot markers and 30 no-carrot markers.
(You could also use a pencil to record whether or not there are carrots in squares on the grid.)

Carrot markers

No carrot markers

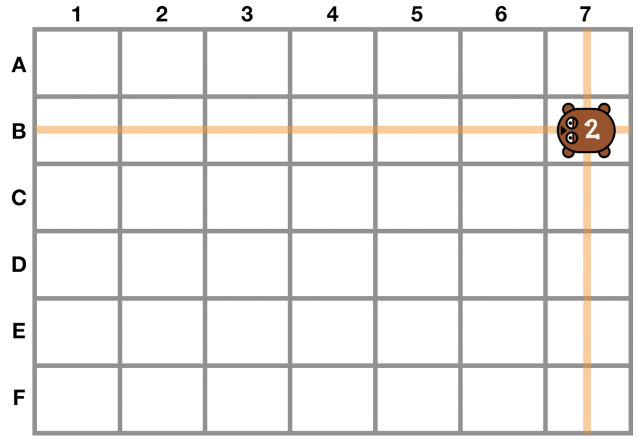


This page is for

Students

Step 1

All the Wombots are gathered around the garden looking for carrots.
Each Wombot has a **number** showing how many carrots it can see — in front, or to its left, or to its right.



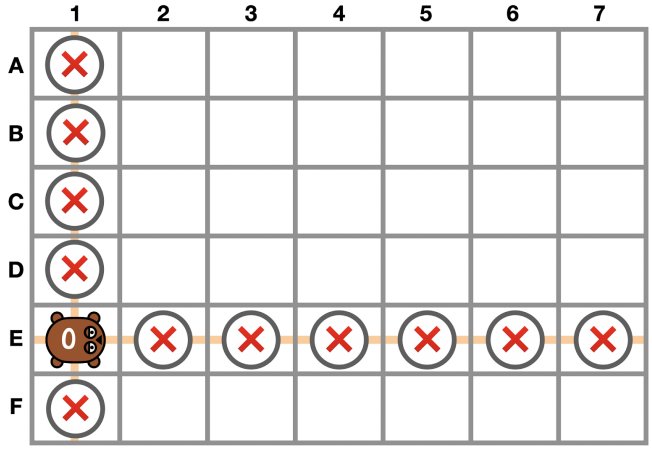
Here is an example.

The Wombot at B7 has the number **2** on its back — so it can see two carrots.

The carrots must be *somewhere* on the orange lines.

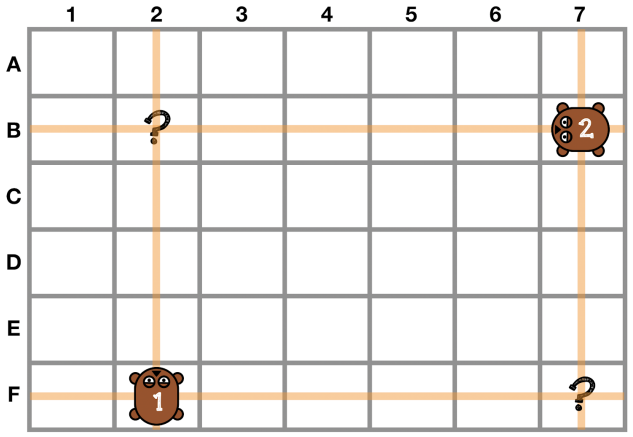
Step 2

If a wombot has zero on its back, then it doesn't see any carrots along its connected lines. Mark the places that are definitely free of carrots with an **X**.



Step 3

When two Wombots get together you can see clues to find the carrots. One place the carrots **could** be found is where the lines from the Wombots cross.



The Wombot at B7 can see **two** carrots, and the Wombot at F2 can see **one** carrot — maybe they are seeing one carrot together!

It could be that there is a carrot where the lines cross — **where the "?" is at B2 and F7!**
Now, a carrot might **not** be there — but it's a clue!

By looking at the numbers on the other Wombots you can combine the clues and work out where the carrots are hiding.

Step 4

Follow the lines from each of the Wombots, and work out where the carrots must be!
Remember, each Wombot's number is the total number of carrots it can see, not more or less.

When you think you're sure of where a carrot is, mark the location with a **carrot marker**.
Mark all the places that you're sure **don't have carrots** with the **X** markers.
(Some of the Wombots **can't see any carrots** — that's a hint!)

When you have placed **all 5 carrot markers**, check if the numbers on each Wombot matches the number of carrots it can see. If you have made a mistake, place the carrot marker somewhere else — keep trying!
When you think you have it right, check the answers with your carer.

Answer key

Choose if you want to print this for your kids or keep it to yourself!

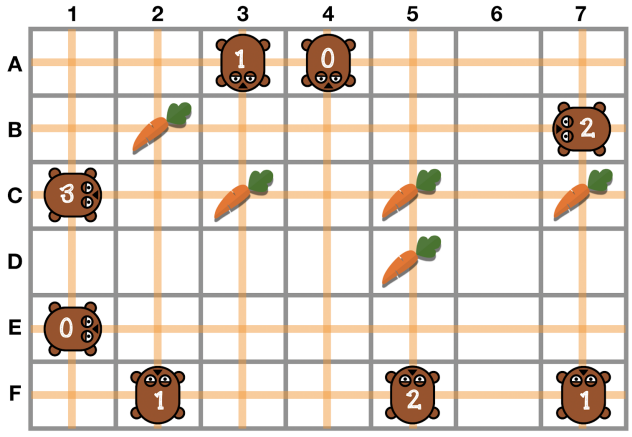
Parents and carers | Teachers

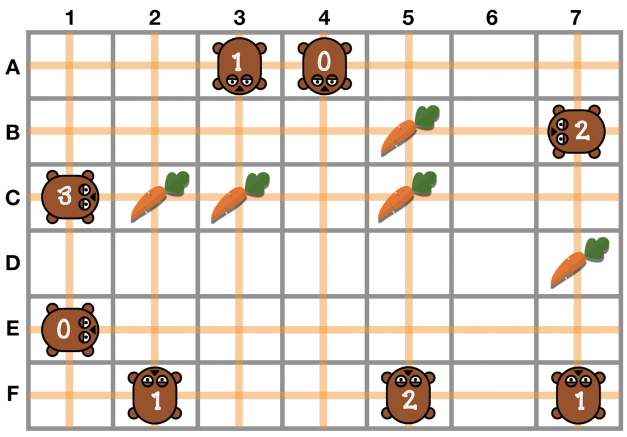
A good place to start is with the Wombots that **can't see any carrots**.
You know that none of the carrots are on the lines drawn from those Wombots — so that's easy!
Put **X** markers on all of those spaces.

Then, you can start working out where the carrots might be. One Wombot can see three carrots — **and they all have to be across row C** (can you see why?). So you can try putting three carrots along row C, and then look at the other Wombots — do they see enough carrots? Or too many? Or too few?

Some hints:
Some carrots can be seen by more than one Wombot.
One carrot can only be seen by one Wombot.

Here are two possible solutions:





Your student may have found another valid solution — there are at least three others!

Want more?

Here are some further activities, online resources, assessment ideas and curriculum references.

Keep learning

Continue learning about algorithms with our friendly wombot by completing the Blockly Wombot DT Challenge: cmp.ac/blockly-wombot

For a more challenging version of this activity take a look at Spaceship Rescue: cmp.ac/spaceship

For teachers creating a portfolio of learning or considering this task for assessment:

Ask students to submit their solution recorded with a pen or pencil rather than markers.
Students can design their own version of this activity by placing carrots and recording how many carrots each wombot can see, then asking a friend or family member to solve the new challenge.

Linking it back to the Australian Curriculum: Digital Technologies

Algorithms
Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition) (ACTDIP019 - see cmp.ac/algorithms)

Refer to aca.edu.au/curriculum for more curriculum information.