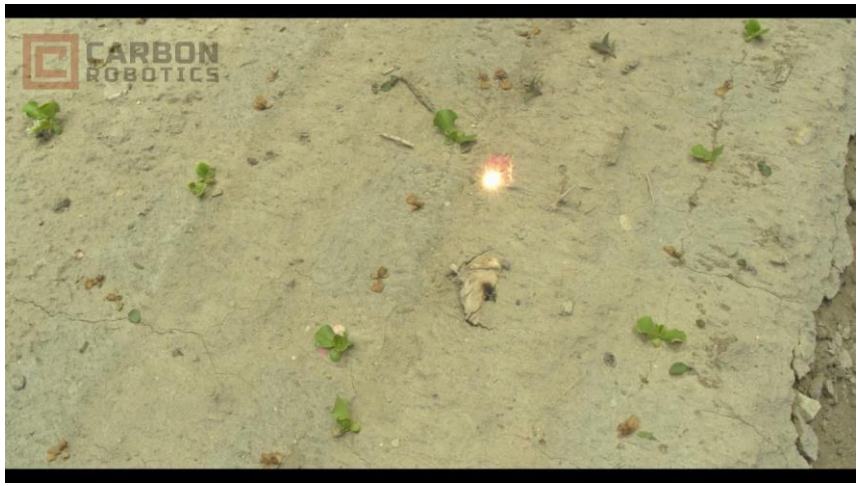
Grade 3 - Growth & Changes in Plants

CARING FOR CROPS

Exciting New Technology!

- Take a look at the two videos of the same robot. What do you think the robot is doing?

Overhead view



Close-up/underneath view

Autonomous Laser Weeder

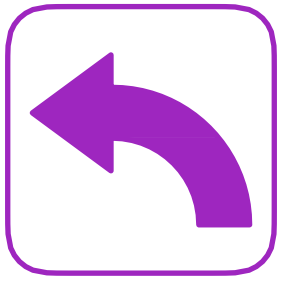
- ***Autonomous*:** drives itself, without a human operator
- This robot drives itself through farm fields, identifying weeds and destroys them with a laser!
- It can tell which plants are farm crops (lettuce, potatoes, etc.) and does not hurt them

Think-Pair-Share

- Why would a farmer want to remove weeds?
- How does this robot help farmers?
- What other tasks could a farming robot like this complete that might be helpful?

Code a Farming Robot!

- Imagine you've designed a farming robot that both waters and weeds the crops
- Using simple commands (below), code your robot to navigate through farm fields and care for the crops



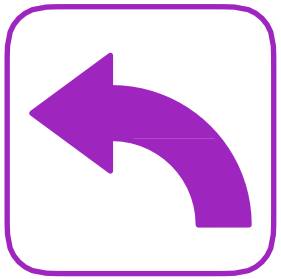
Turn Left

Forward

Turn Right

Weeding

Commands



Turn Left

Robot turns on the spot, 90° to the left

Forward

Robot moves one square forward

Turn Right

Robot turns on the spot, 90° to the right

Commands

Weeding
Removes weeds. On the map, weeds are represented by little red stars.

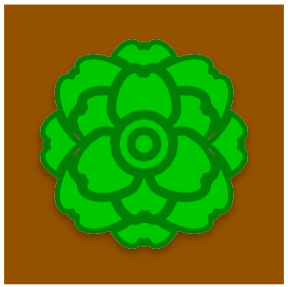
Depending on the type of robot you are using, this action might be represented by a sound, spin, light colour, etc.

Decide:
What robot action will you use to represent farming?

Rules

- The robot must start on the start square, pointing in the direction of the arrow
- The robot must drive over <u>every crop</u> to water it
- For crops with a red star, the robot must eliminate weeds while on that square

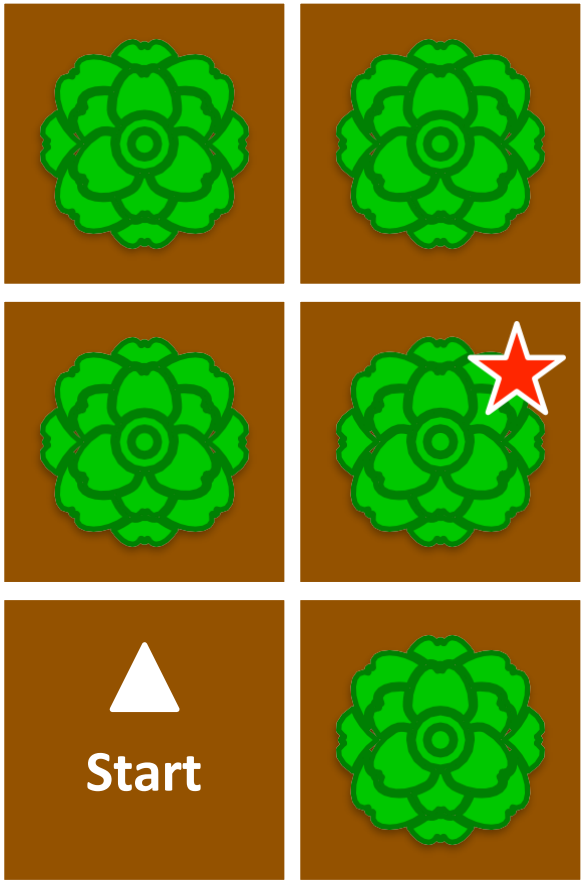
Start Square



Regular Crop

Crop with Weed

Example Field Map

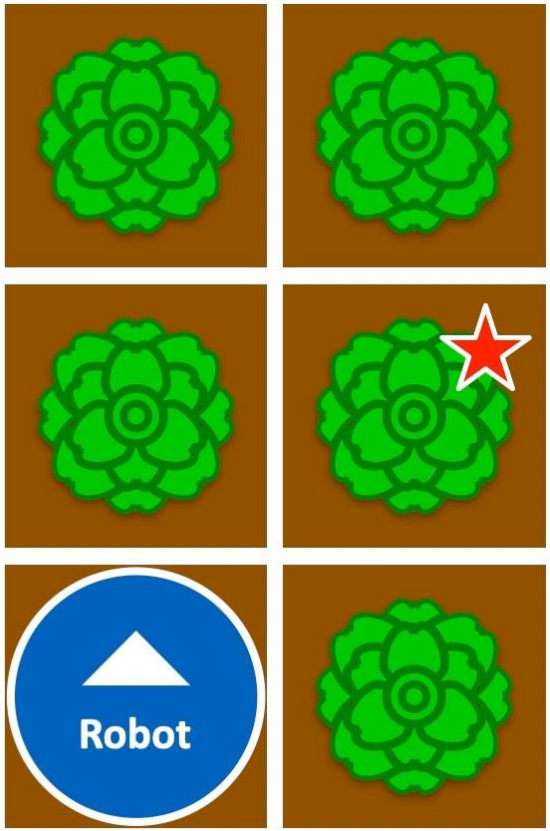


How might you solve this map? There are many ways to solve it, but the fastest way uses only eight steps.

Work together as a class to solve this first map!

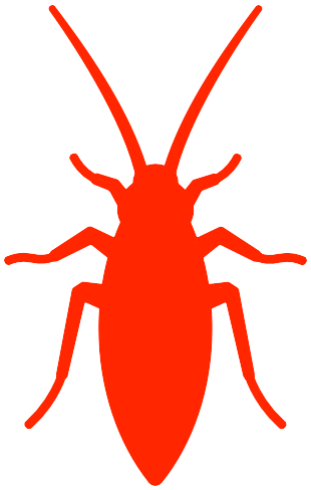
Step 1	Step 2	Step 3
Step 4	Step 5	Step 6
Step 7	Step 8	

Example Field Map Walkthrough



Step 1	Step 2	Step 3
Step 4	Step 5	Step 6
Step 7	Step 8	

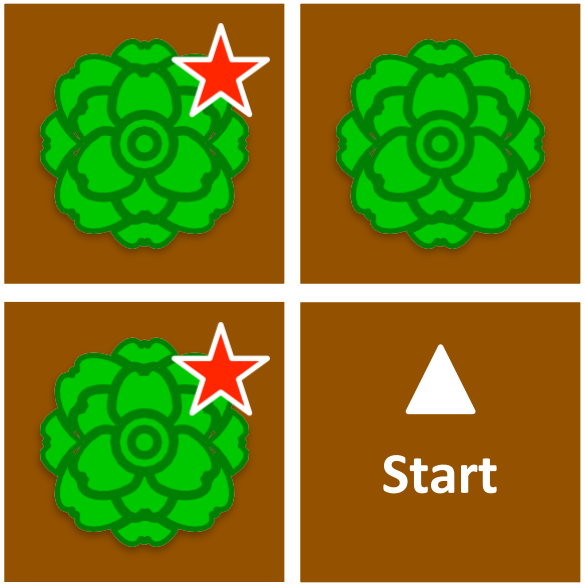
Debugging



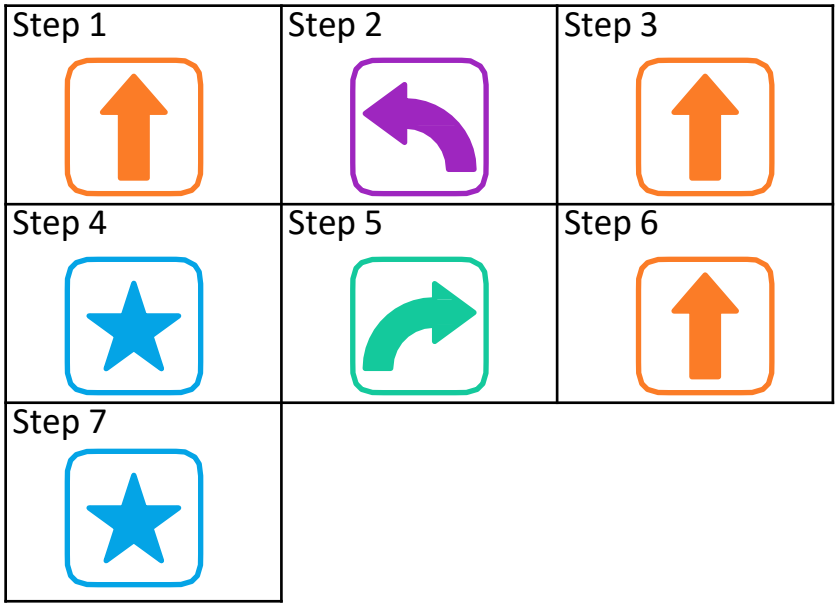
- You may have heard the term “computer bug” before. What does it mean?
- When talking about coding, a bug is an error in the code
- “Debugging” means identifying and fixing errors in code

Fun fact! We call it a “bug” because in the 1940s a moth got stuck in a computer and caused a malfunction!

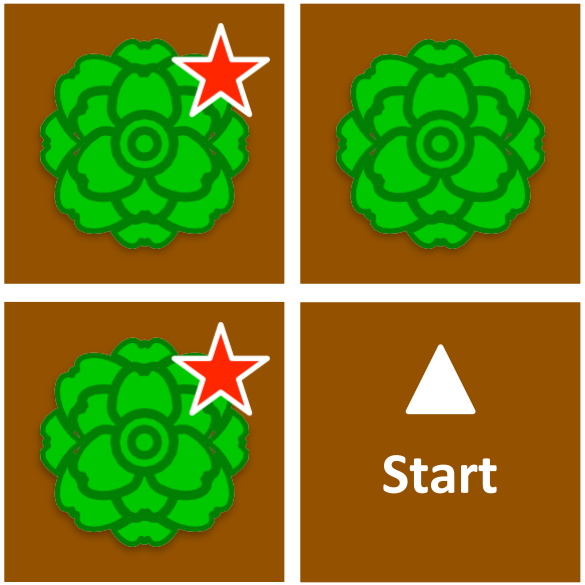
Example Field Map Debug



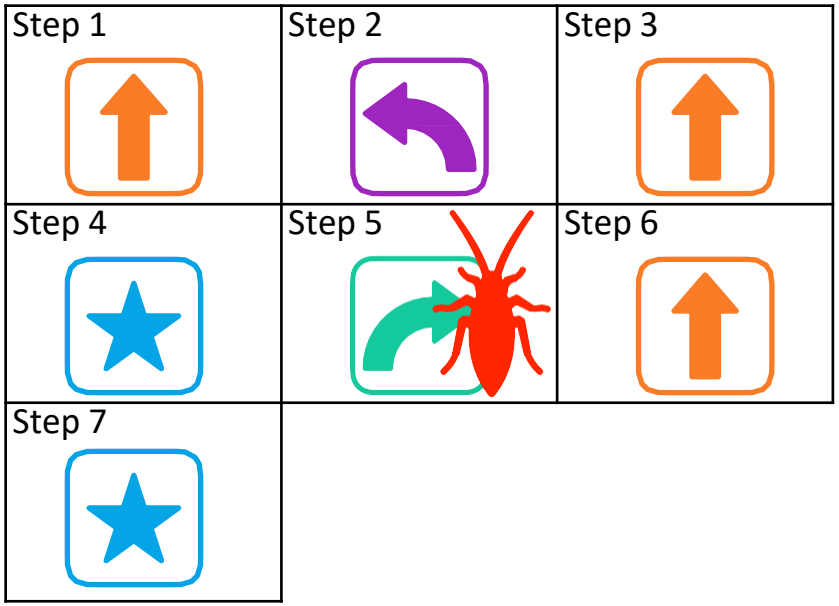
The solution below has a bug in it! Can you debug the code?



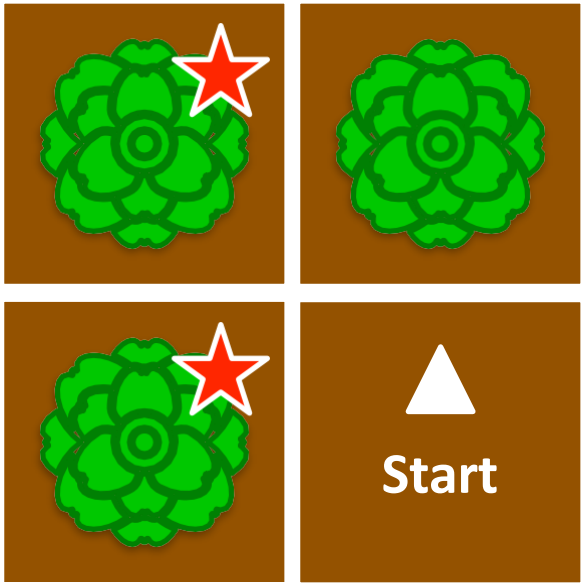
Example Field Map Debug



You got it! The bug was on **step 5**. Now that we've identified the problem, how do we fix the code?



Example Field Map Debug



Fixed! This is now a correct solution for this map. Remember that each map can have multiple correct solutions.