

Lesson 7

A Network Game!

Robots That Talk To Each Other

STEAM · 45 minutes · Beginner

Today your robots start sending each other messages through the air.

No Wi-Fi router needed — they find each other all by themselves.

By the end

You will build a racing game where robots hunt for the color blue!

What You Will Be Able To Do Today

1

Make several mBot2 talk to each other wirelessly — with no Wi-Fi access point

2

Write a program in mBlock that controls more than one robot

3

Use random selection so a robot makes unpredictable choices

4

Explain what a LAN is and where you meet one in real life

LAN Means Local Area Network

- LAN stands for Local Area Network
- It is a group of computers and devices connected within one area, usually a building
- The network lets them exchange data with each other
- It can also connect on to other networks, like the internet

Your turn

Where have you seen a LAN? The school computer room? Home Wi-Fi?

Every Network Needs A Connection And A Language

- Devices need some way to connect: cables, or wireless radio waves
- They also need a shared “language” so they understand each other
- That shared language is called a protocol
- Usually a managing device called a router directs all the traffic
- On Wi-Fi that job belongs to an access point or the internet router

Key word

Protocol = an agreed language. Just like everyone in class speaking English.

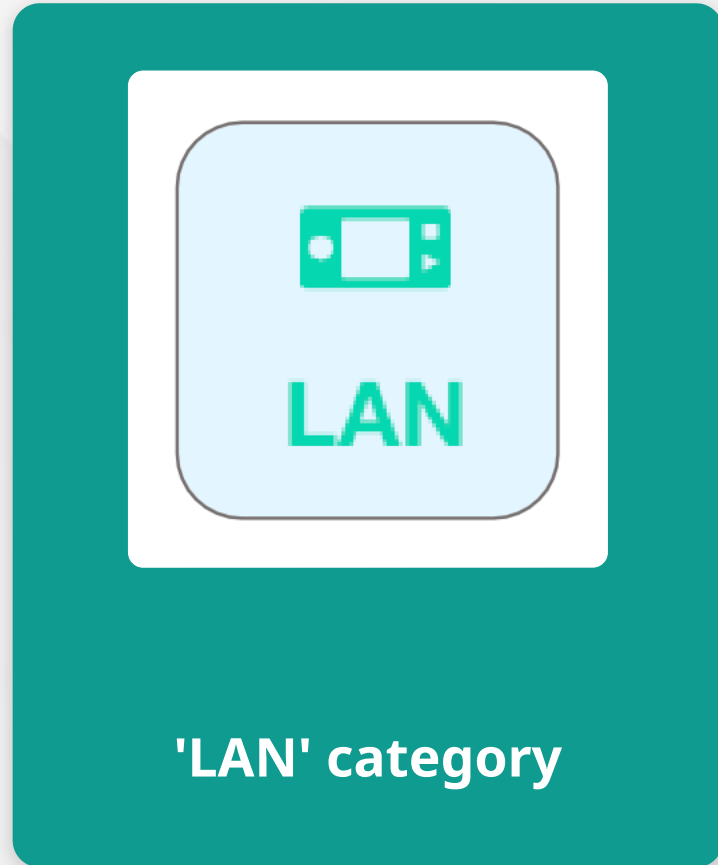
Your Robots Skip The Router Entirely

- mBot2 has a built-in Wi-Fi module
- Put several mBot2 or CyberPi in the same room, within 30 metres
- They automatically form a network connection with each other
- No Wi-Fi access point and no router required
- If you do use a router, every device must be on the same channel

So cool!

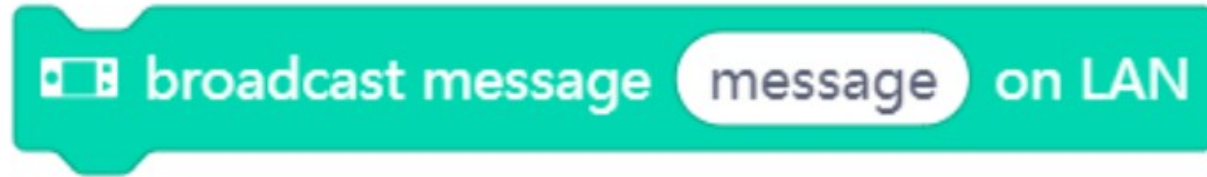
The robots organize themselves — bring them close and they build the network on their own.

The Green LAN Blocks



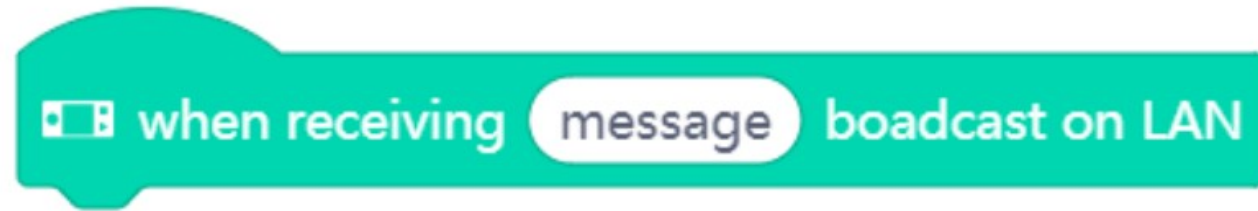
- Find these blocks in the 'LAN' category in mBlock
- They are green — easy to spot in the block area
- A few blocks are all you need to send and receive messages
- Everything today happens inside this one category

Broadcast A Message To Everyone



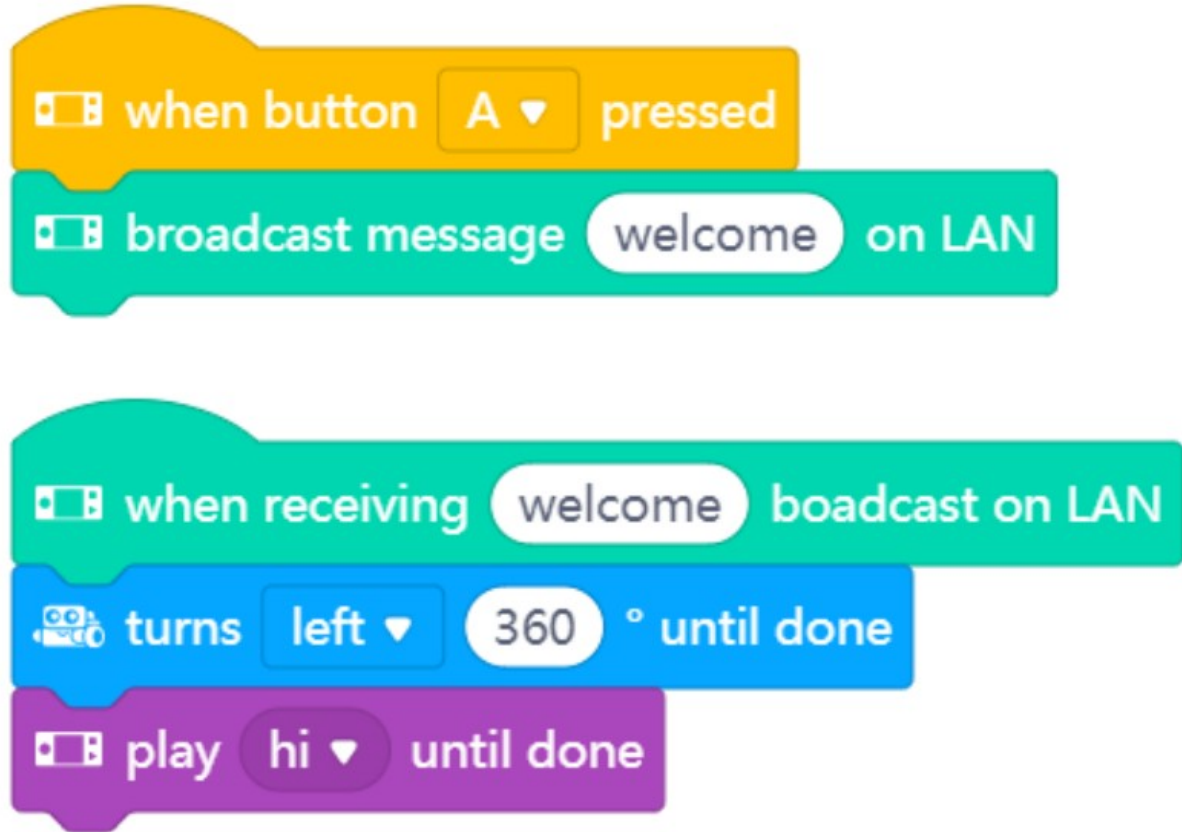
- This block sends a message to every other mBot2 and CyberPi on the network
- You give the message a name, like a topic or a subject line
- Everyone nearby receives it at once
- Think of it as shouting across the room rather than whispering to one friend

An Event Block Listens For You



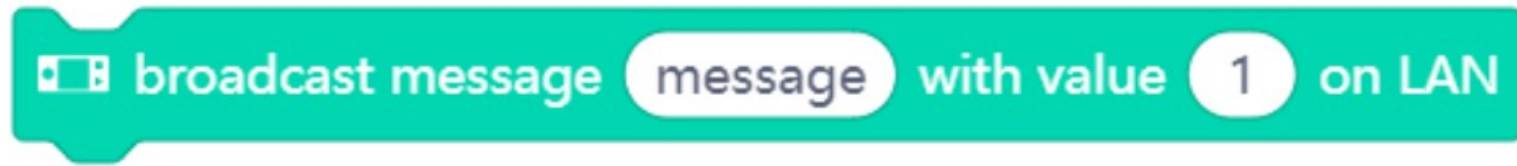
- Rather than constantly checking for messages, use this event block
- The code attached runs once, when a message with that exact topic arrives
- Events are efficient — no wasted checking in a loop
- The topic must match, or nothing happens

Two Robots, Two Programs, One Conversation



- The first program is the broadcasting unit for robot one
- The second program is the receiver code for robot two
- Upload both parts — a sender never receives its own message
- Restart the robots after uploading
- Press A on the first robot and the second one reacts
- Try it: what happens if you press B on the second robot?

You Can Send A Value, Not Just A Topic



- This block sends a message plus a specific value
- The value can be a number or a piece of text
- The topic says what kind of message it is; the value carries the detail
- Like saying “score” and then “seven”

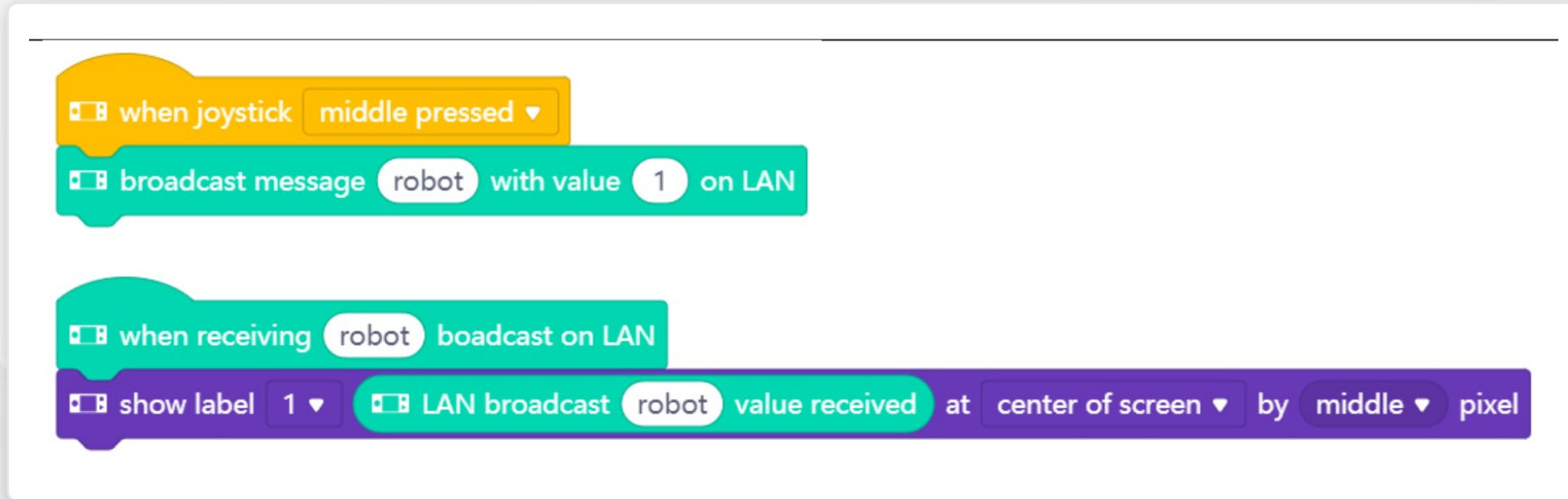
Read The Value With A Reporter Block

A Scratch LAN broadcast message block. It is a teal rounded rectangle containing a small square icon with a plus sign, followed by the text "LAN broadcast", a white rounded rectangle containing the text "message", and finally the text "value received".

LAN broadcast message value received

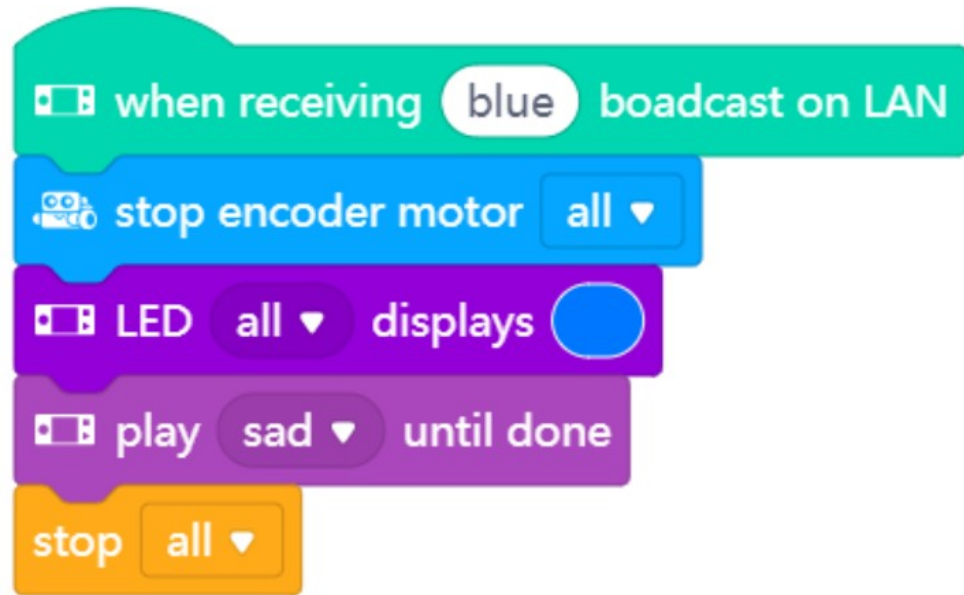
- Use the same event block to catch the message
- Then use this dedicated reporter block to get the value out
- Save it in a variable, show it on screen, or test it in an if
- The example sends value 1 when you press the joystick

Sending A Value Between Two Robots



- Program one broadcasts a topic with a value attached
- Program two catches the topic and reads the value
- Upload to both robots, then restart them
- Push the joystick on robot one and robot two receives value 1
- Recreate both programs and test them

Random Choice Makes Robots Unpredictable

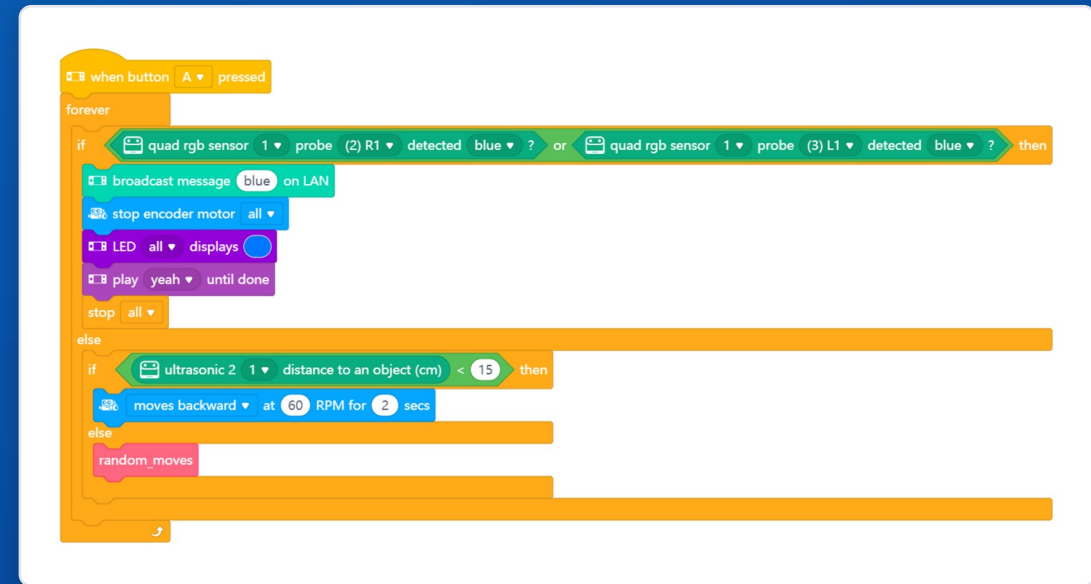


- This block picks a value at random from a range you choose
- Give each possible value its own instruction
- Now the robot chooses in a non-linear way — you cannot predict it
- That is how the robots will wander the floor searching
- Tidy it up by putting the driving instructions inside a custom block

Your Mission

Looking For The Color Blue

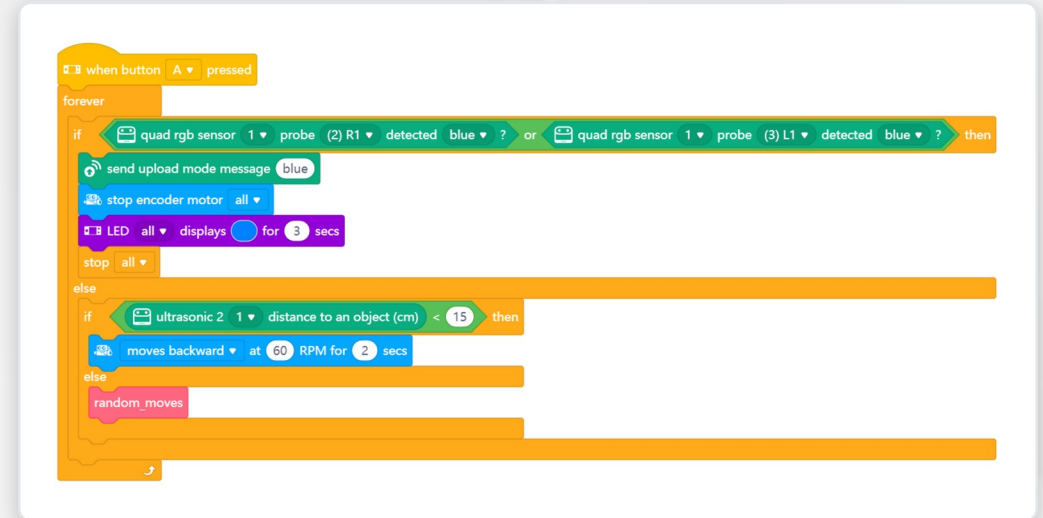
- A group of mBot2 hunt the floor for the color blue
- The first robot to find blue sends a LAN message to all the others
- That robot wins the game!
- Upload the same program to every robot so they all follow identical rules
- You need blue color cards on the floor



25 minutes

Only Have One Robot? Use A Sprite

- You can simulate two devices using a sprite on the mBlock stage
- The stage is the area in the upper left of the mBlock screen
- Add the “Upload Mode Broadcast” extension for the sprite and the robot
- For the sprite: Sprites → Extensions → Sprite extensions → add it
- For mBot2: Devices → Extensions → Device extensions → add it
- When the robot finds the color, the panda sprite announces it on screen



Showtime and Wrap-Up

- Did you succeed in programming the game?
- Film a short, fun movie of the hunt
- Reflect: What worked out well? What could be better?
- Which parts were easy, and which were tricky?
- What do you want more explanation about, and who could help you?

Today you learned

- What a LAN is
- How to set one up between robots
- How to use random selection