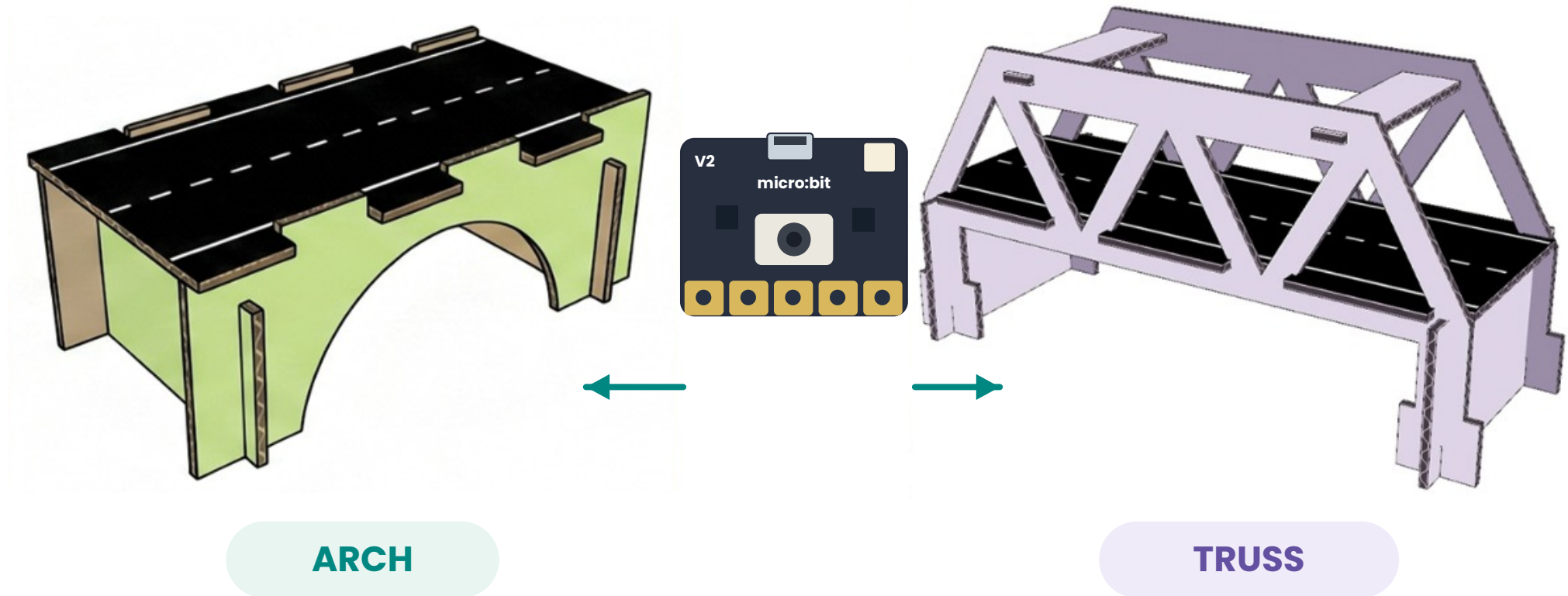


Two bridges. One shake alert.

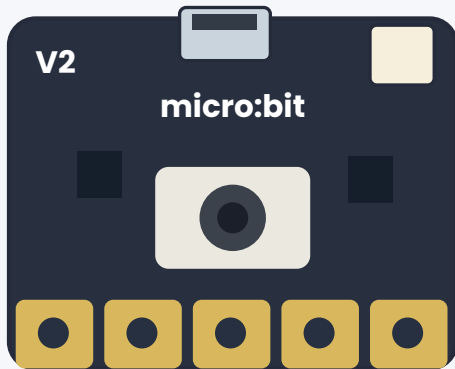
Build an arch bridge and a truss bridge. Test one bridge at a time.



✓ A grown-up moves the same micro:bit from one bridge to the other.

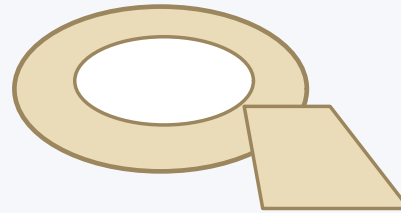
Find the things you need

Ask a grown-up to get the electronics ready.



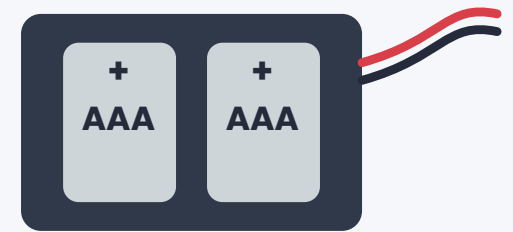
micro:bit V2

It can sense a shake and make a sound.



Paper tape

Holds the board under the road.



Power

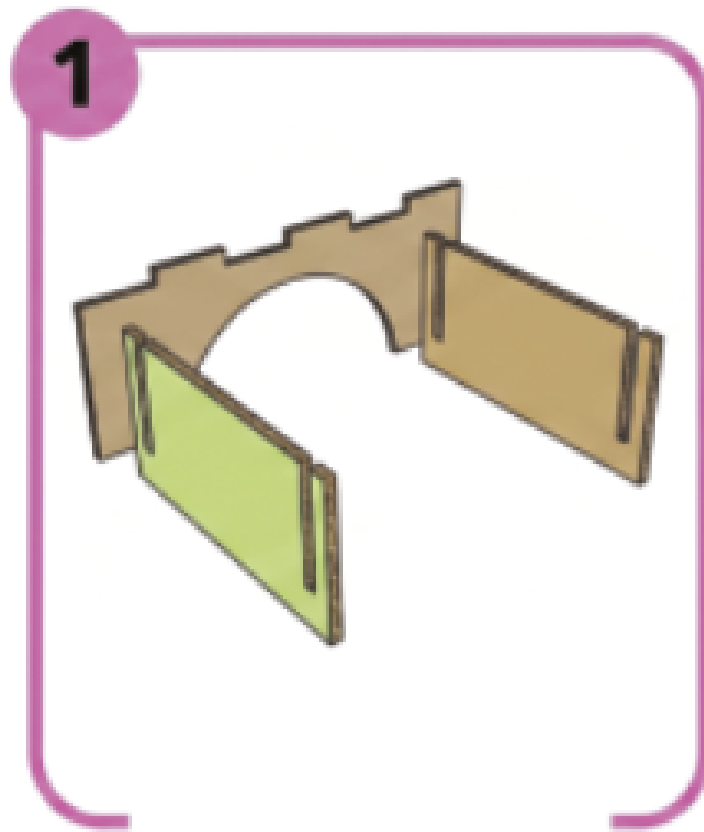
An adult uses the supplied battery pack or USB lead.

Also needed for setup: a computer and a USB data cable.

✓ Ask an adult to load the program on page 15 before mounting the board.

A1 Join one arch side

Match the slots in one arch side and the two end pieces.



LOOK HERE

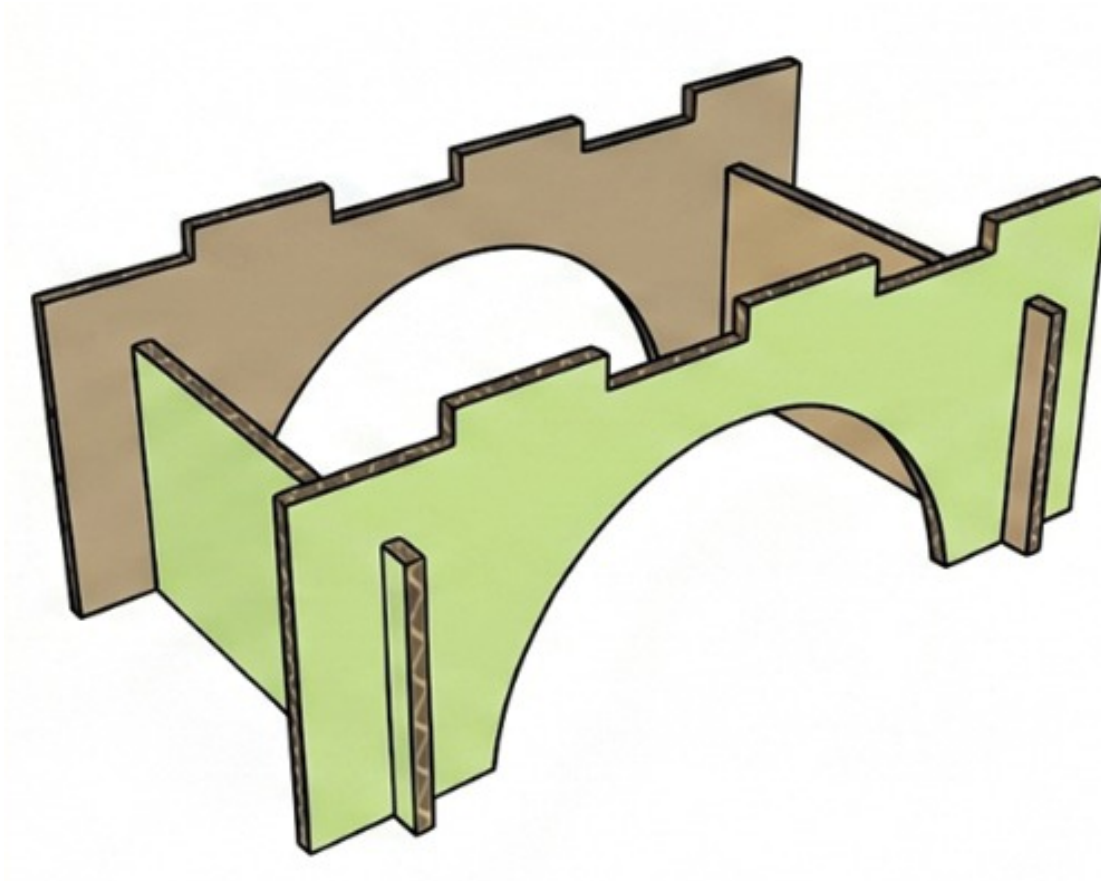


Match the slots.

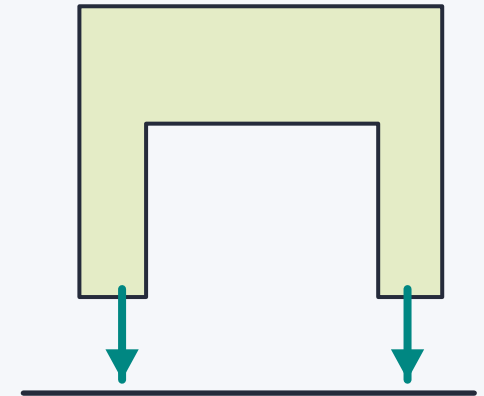
✓ Slide the matching slots together gently.

A2 Add the other arch side

Fit the other arch side onto the end pieces. Stand the frame on a flat table.



LOOK HERE

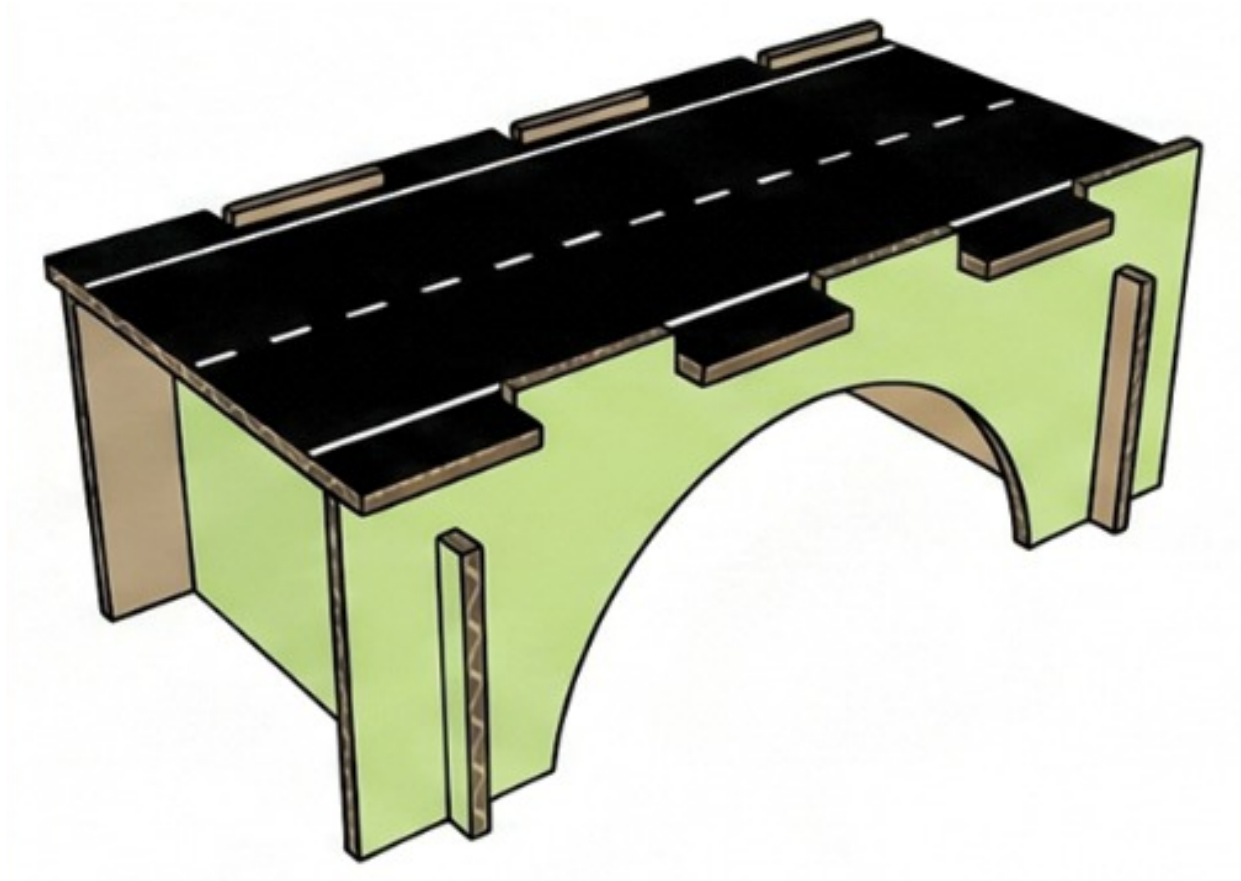


Feet sit flat.

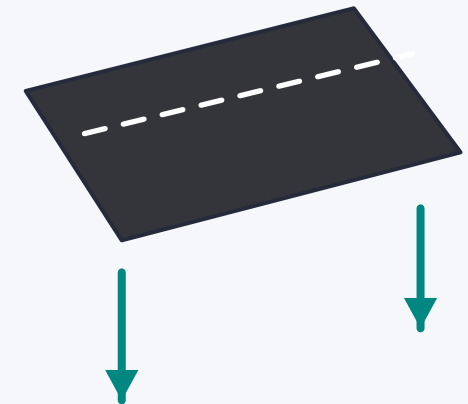
✓ The two arch sides stand straight and all feet touch the table.

A3 Add the road

Match the road edges to the top tabs. Press gently.



LOOK HERE

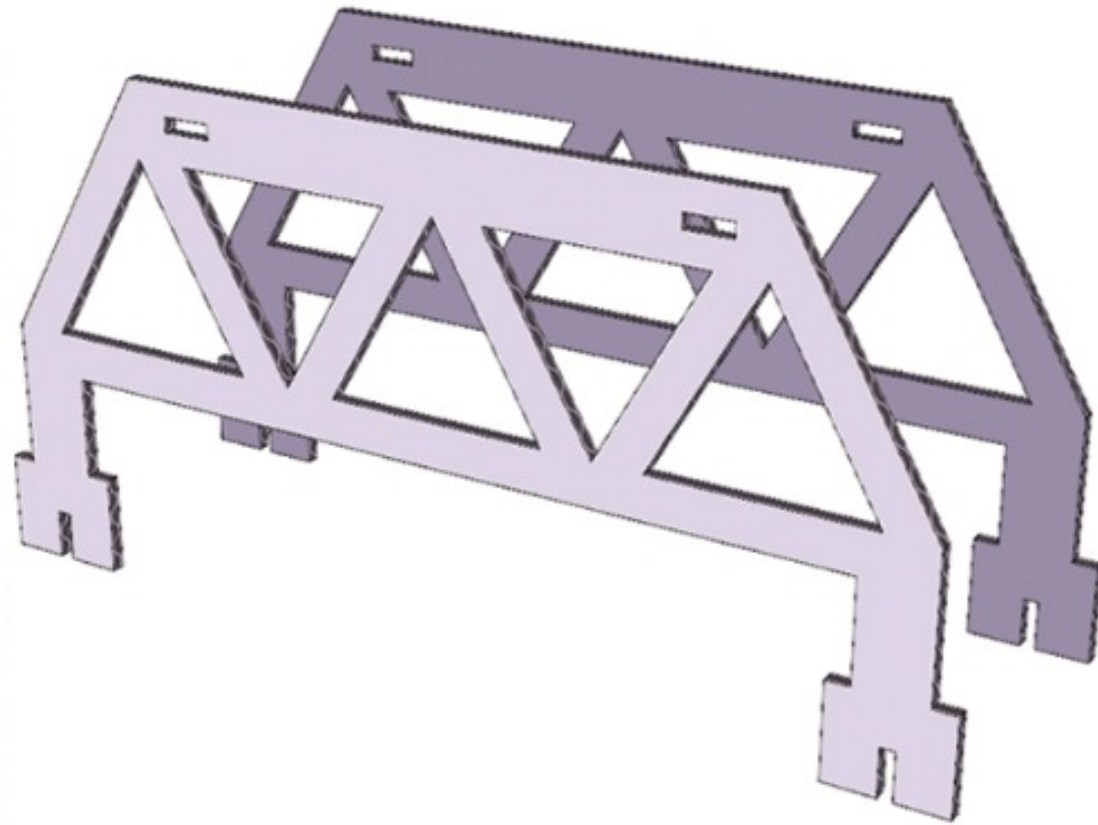


Road on top.

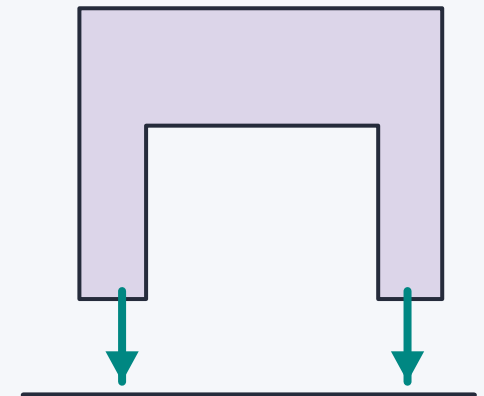
✓ The road lies flat on both sides.

T1 Stand the truss sides

Stand the two triangle sides next to each other. Ask a partner to hold them.



LOOK HERE

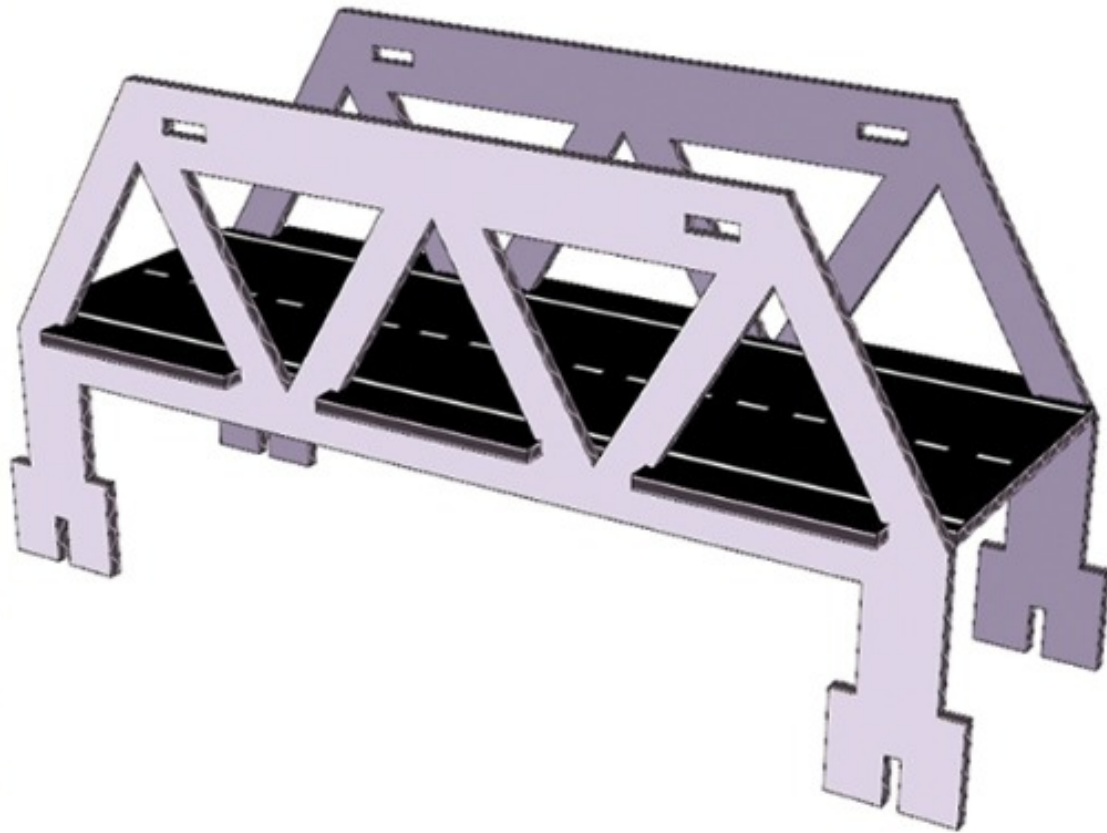


Feet sit flat.

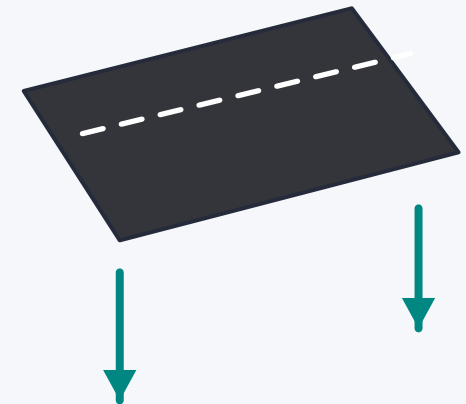
✓ The matching sides face each other.

T2 Slide in the road

Fit the road between the two triangle sides. Match its tabs.



LOOK HERE

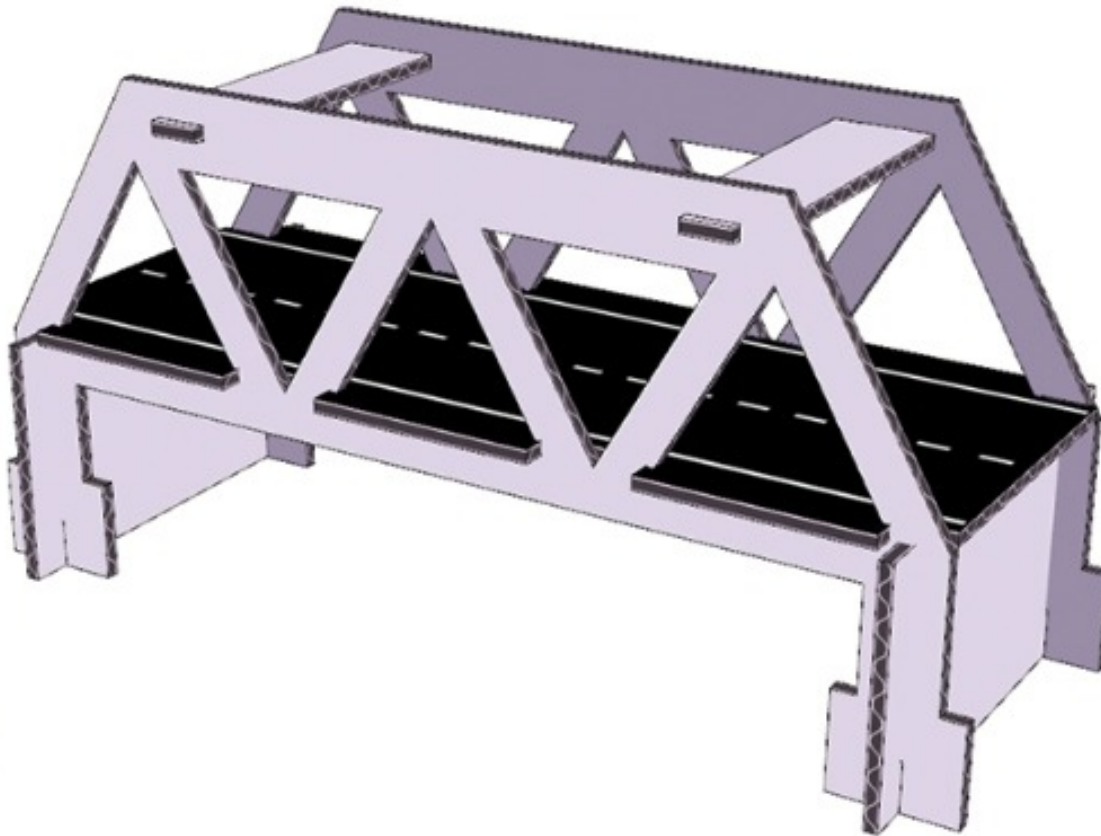


Road on top.

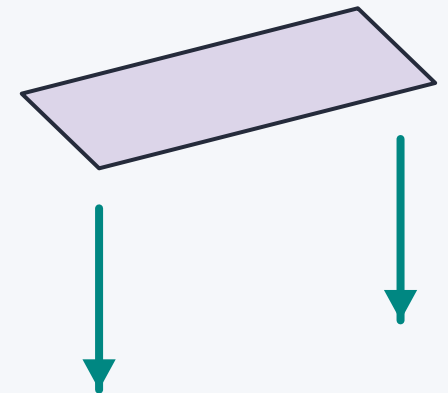
✓ The road is supported at both sides.

T3 Join the top bars

Fit the small bars across the top.



LOOK HERE

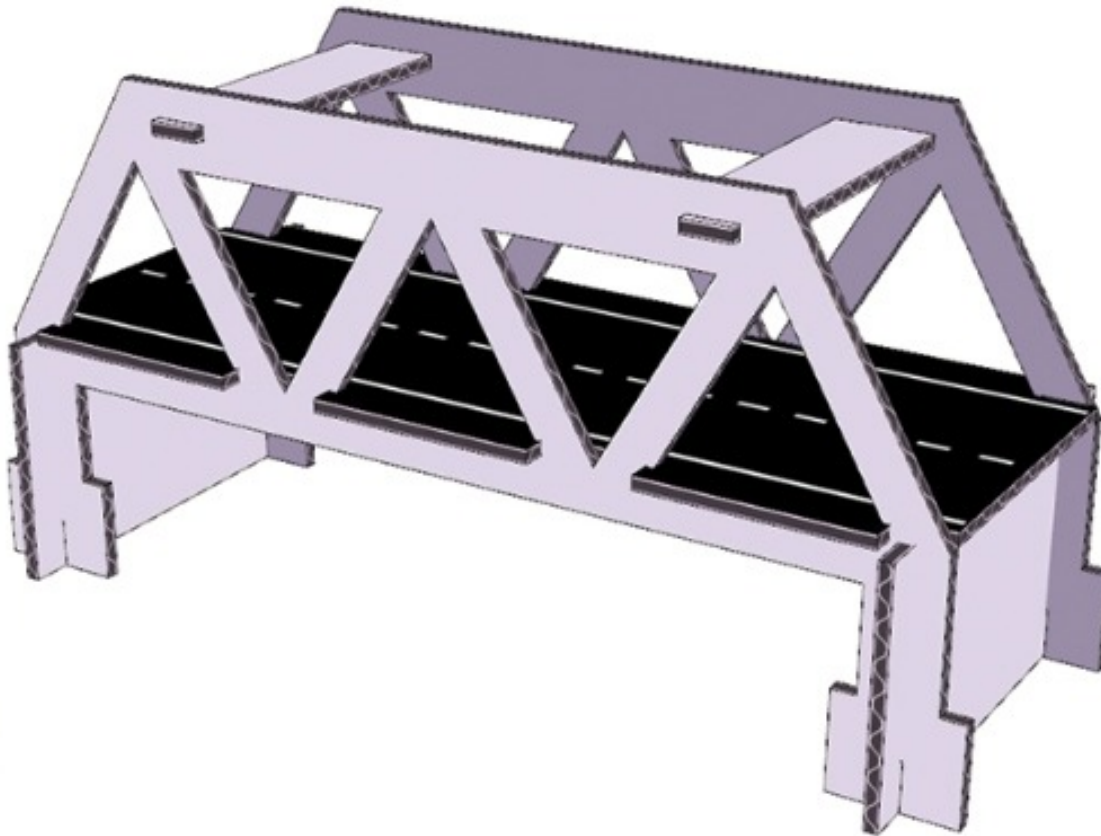


Join the top slots.

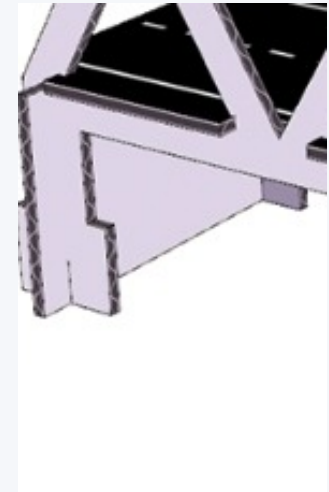
✓ Each top bar joins the two sides.

T4 Add the end supports

Slide an end support into the matching leg slots at each end.



LOOK HERE

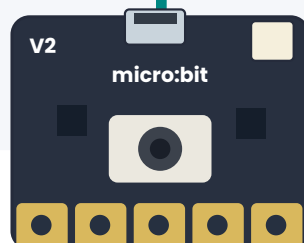
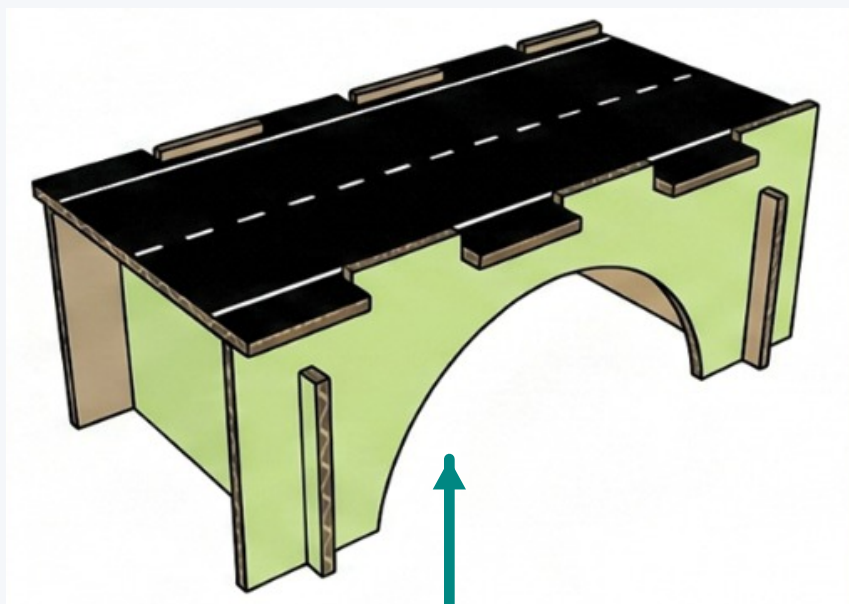


Match the slots.

✓ Both end supports fit. All the feet sit flat.

1 Put the board underneath

An adult turns off the power, then places the board under the road.



**Near the middle.
Speaker faces out.**

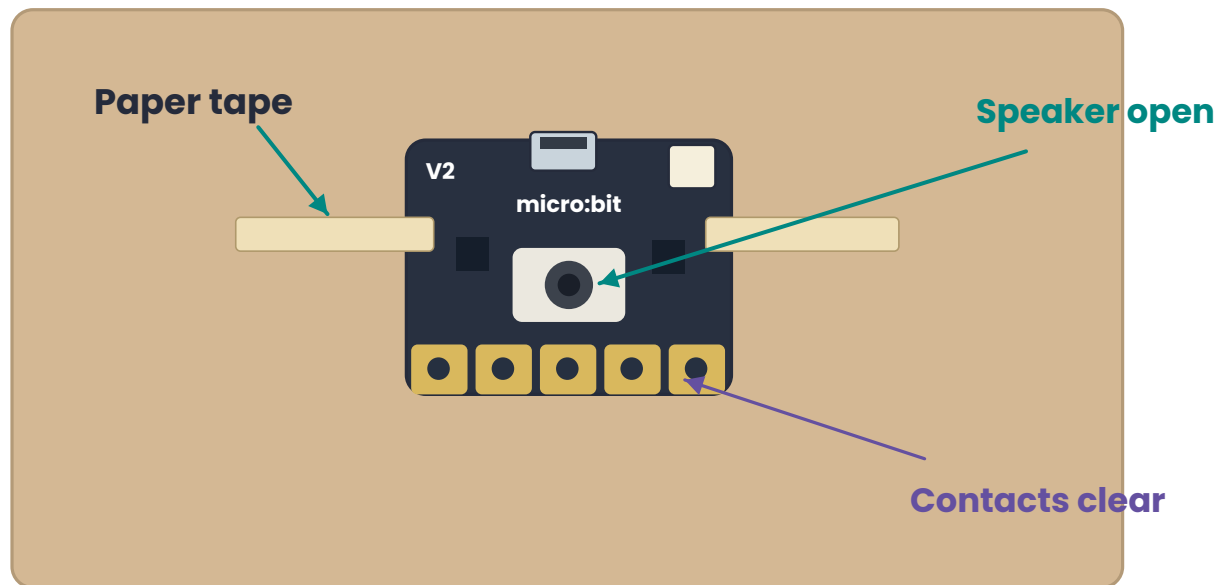
An adult keeps the buttons and small parts from being pressed into the cardboard.

✓ Choose a clear space under the road. The speaker needs open space.

2 Hold it with paper tape

An adult tapes the clear edges so the board moves with the bridge.

UNDER THE ROAD



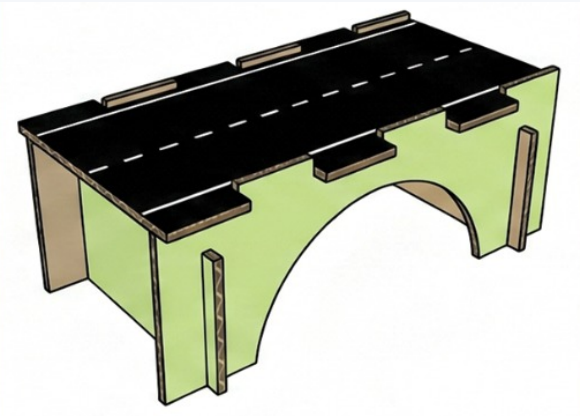
Power off while taping

✓ Leave the speaker, plugs and gold contacts uncovered. The board must not dangle.

Shake. Listen. Be still.

An adult connects power. Keep the bridge close to the table.

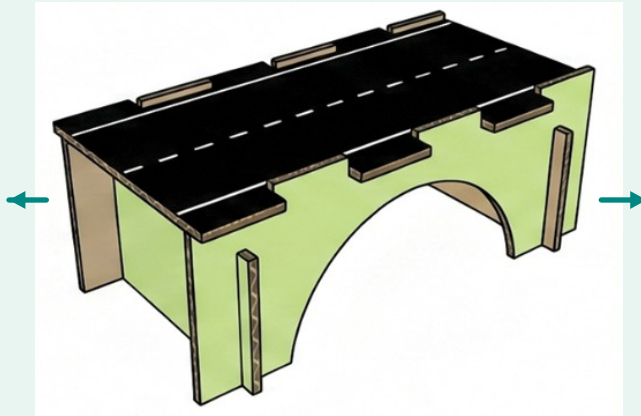
1 Be still



QUIET

Leave the bridge still.

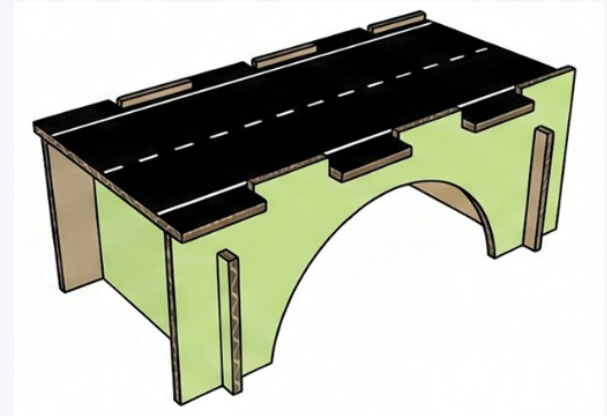
2 Small shake



BEEP

Gently move the bridge.

3 Stop moving



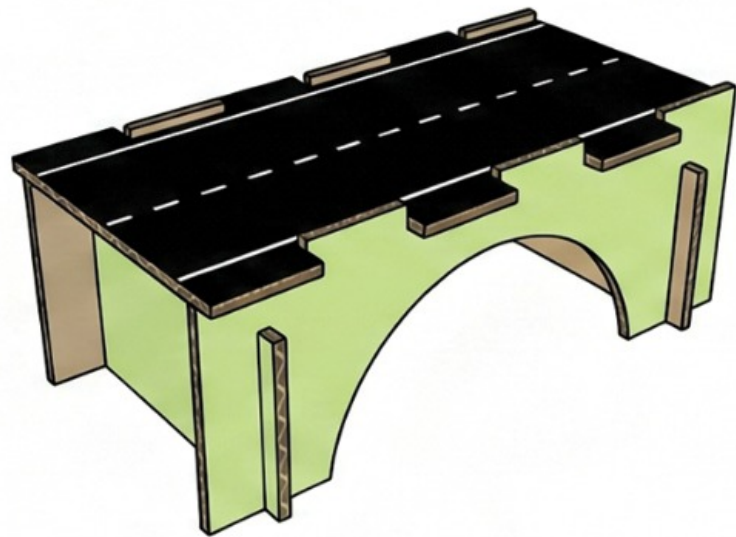
QUIET

Hold the bridge still again.

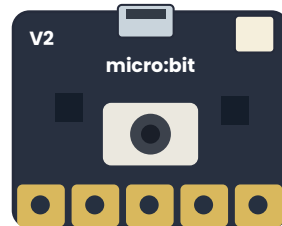
✓ The tone plays when a shake is detected. It stops when a shake is no longer detected.

Try your other bridge

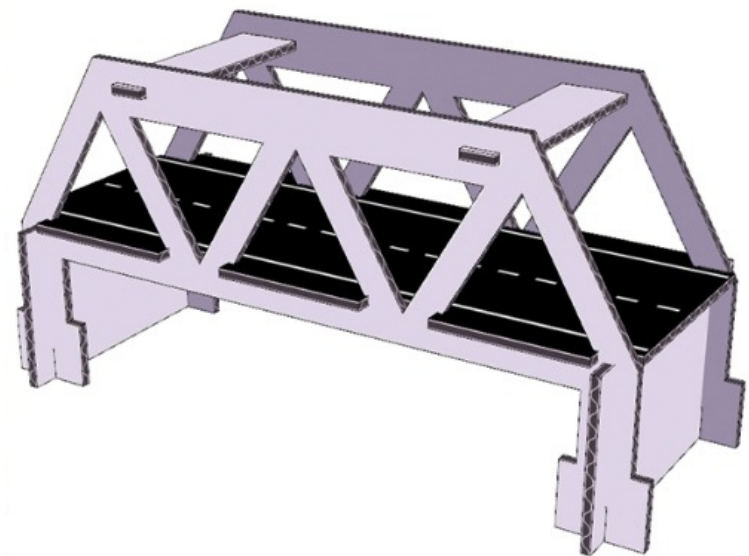
An adult turns off power, gently removes the tape and moves the board.



Tape it firmly



Power on



Test again

✓ Repeat the same three tests: still, small shake, still again.

Teach the bridge a rule

A sensor notices movement. A program tells the board what to do.

IF it feels a shake...

make a sound.

ELSE...

stop the sound.

What happened when the bridge was still?

✓ The alarm notices movement. It does not tell us which bridge is stronger.

Adult setup: load the code

Use a micro:bit V2 for its built-in speaker. No extra movement sensor or buzzer is needed.

COPY THIS CODE / JAVASCRIPT

```
music.setBuiltInSpeakerEnabled(true)
music.setVolume(80)

basic.forever(function () {
  if (input.isGesture(Gesture.Shake)) {
    music.ringTone(262)
  } else {
    music.stopAllSounds()
  }
})
```

This program enables the built-in speaker and sets volume to 80. Paste this text into MakeCode, then use Download to send the compiled program to the board.

1 Open MakeCode

Go to makecode.microbit.org and create a new project.

2 Add the program

Open JavaScript. Replace the starter code with all the code shown on the left. You can switch back to Blocks.

3 Download to the board

Connect a USB data cable. Choose Download and follow the instructions. If a .hex is saved, copy it onto MICROBIT.

4 Wait, unplug, mount

Wait for transfer to finish. Disconnect power before taping. Reconnect the supplied power source after mounting.

✓ Confirm still → shake → still works on the real board before using it in class.

For the grown-up

Before use, test the cardboard fit, tape placement and sound on both actual bridges.

Age and handling

The manufacturer says to keep bare micro:bits out of reach of children under 8. For younger pupils, the adult handles and operates the electronics while the child predicts and observes. Keep hands dry; hold an unpowered board by its edges.

If the tone does not behave

Check V2, power, the loaded program, speaker setting and volume. Confirm the board moves with the road. Tiny vibrations may not trigger the shake gesture; allow time for it to clear when still. Do not compensate by hitting or dropping the bridge.

Power and mounting

Use the supplied compatible battery pack or USB lead. Keep the speaker and connectors clear. Support the power pack or cable separately with some slack. Test that paper tape holds without stressing components or tearing cardboard.

Confirm the final pictures

The original assembly images are retained. Close-ups explain the type of action; confirm each slot and end support on the prototype. Trial the pages with children before release. This activity detects movement; it is not a calibrated strength or earthquake test.

OFFICIAL REFERENCES

[Features / speaker](#)[Safety guidance](#)[Shake gesture](#)[Sound control](#)