Kiwi Camp Day 1 •

Grownup Guide

Real-Life Robots

Activity •	Do and learn 🖓	Time needed 🔀
Robots and Coding crate	MAKE a robot buddy. PLAY a coding game. LEARN about robots and coding.	90 minutes or more
Meet a Roboticist video	WATCH the video. LEARN about making robots.	10 minutes
Brush Bots video	WATCH the video. MAKE a silly wiggly bot. LEARN about electric circuits.	40 minutes or more
Robot Grabber Challenge printable	MAKE a cardboard grabber. EXPERIMENT with picking things up.	40 minutes or more
Robot Drawing Cards printable	DRAW your own robots. LEARN about real-life robots.	20 minutes

Today, your camper will explore a hands-on coding game and engineer their own creative bots! You can do these activities in any order you like, extend something if your kiddo is really into it, or cut things short if they're ready to move on. (And don't forget to schedule time to visit the canteen for snacks — camp is hungry work!) When you're ready to get started, it's easy as 1-2-3.

- 1. Just bookmark kiwico.com/camp/kiwi/day1,
- 2. print this guide,
- 3. and gather your gear.

Done? High five! We hope you and your camper have an awesome time making and learning together at Kiwi Camp, and we'd love to see what you create. Tag us with #kiwico to show off, or just to say hi!

See you at camp!
The Camp KiwiCo team



Gather your gear for Real-Life Robots

Robots and Coding crate

scissors

cardboard (you can use your Kiwi Crate box)

glue

tape

3 plastic straws

string or yarn

ruler

rubber bands (optional)

small balls (or other objects to pick up)

pencil

Brush Bots project (look for the motor and battery case at an electronics store or online)

2 AA batteries

battery case that fits AA batteries with a wire and switch

3-volt hobby motor

electrical tape or duct tape

cork

scissors

double-sided sticky foam or duct tape

scrub brush

wiggle eyes and other decorations



Meet a Roboticist

Watch 10-year-old aspiring roboticist Taylor interview Dr. Siddhartha Srinivasa, a professor of computer science and engineering at the University of Washington.

What is a roboticist?

A roboticist is someone who designs, builds, and tests new and exciting robots. Some roboticists are computer scientists who help program the robot to do certain things, while others are engineers who build the robot's body and make it move.

Who is Dr. Siddhartha Srinivasa?

Siddhartha Srinivasa is a professor and roboticist interested in building robots that can do complicated tasks in tricky, real-world situations. His team designed HERB (short for "Home Exploring Robot Butler"), a robot that can open a refrigerator, unload a dishwasher, serve a meal, and even split an Oreo cookie from the cream! Siddhartha's team is also working on a new robot, called ADA, that can help feed people with disabilities who can't feed themselves.

If you were a roboticist, what robots would you make? What jobs would they do?



Brush Bots

You'll need

2 AA batteries

battery case that fits 2 AA batteries with a wire and a switch

3-volt hobby motor

electrical tape or duct tape

scissors

cork

double-sided sticky foam or duct tape

scrub brush

wiggle eyes and other decorations

Step 1

Watch the Brush Bots video at **kiwico.com/camp/kiwi/day1**.

Step 2

Make sure the switch on the battery case is in the off position, then put the batteries inside.

Step 3

Connect the wires from the battery case to the wires on the motor by plugging the ends together (red to red and black to black). Then wrap some electrical tape or duct tape around the connections.

Step 4

Push the middle of the cork onto the shaft (pointy part) of the motor.

Step 5

Attach the battery pack and motor to your brush using sticky foam or duct tape. The motor should be on the very edge of the brush, so the cork can still spin.



Step 6

Decorate your brush bot! Add wiggle eyes, yarn, felt, or whatever strikes your fancy. Make sure you can still get into the battery pack.

Step 7

Turn on the battery pack and watch your brush bot move and groove!



All a-bot bots

Fill in the words for the sentences below. If you need a refresher on how your brush bot works, watch the Brush Bots video again at **kiwico.com/camp/kiwi/day1**.

Why did the robot fail its test?

1. A is a loop of wires that goes from your battery pack to your battery pack	ur
2. Robots are that can do a task all by themselves	
3. A motor turns electricity into	
4. You need to put your batteries in the right way, so that co	
Why did the robot fail its test?	
It was a little !	

Robot Grabber Challenge

You'll need

printable robot grabber template

cardboard (you can use your Kiwi Crate box)

glue

scissors

tape

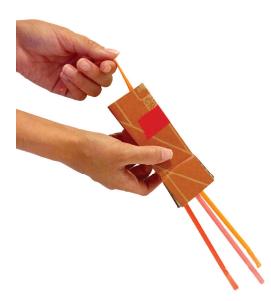
3 plastic straws

string or yarn

ruler

rubber bands (optional)

small balls (or other objects to pick up)



Step 1

Cut three pieces of string, each about 15 inches long.

Step 2

Cut a notch 1 inch below the top of each straw.

Step 3

Thread a piece of string through each straw.

Tape the end of the string to the top of the straw.

Step 4

Cut out the robot hand template and glue it onto the cardboard. Make sure the blue rectangles on the template run in the same direction as the ridges of the cardboard.

Step 5

Cut the template out of the cardboard along the dashed line border. Then cut along the remaining dashed lines.

Step 6

Crease the cardboard along the green lines.



Step 7

Tape a straw onto each blue rectangle so that the bottom of each straw touches the green line. Make sure the notches are facing up.

Step 8

Fold the cardboard inwards along the long green lines to make a triangle. Tape the flap closed.

Step 9

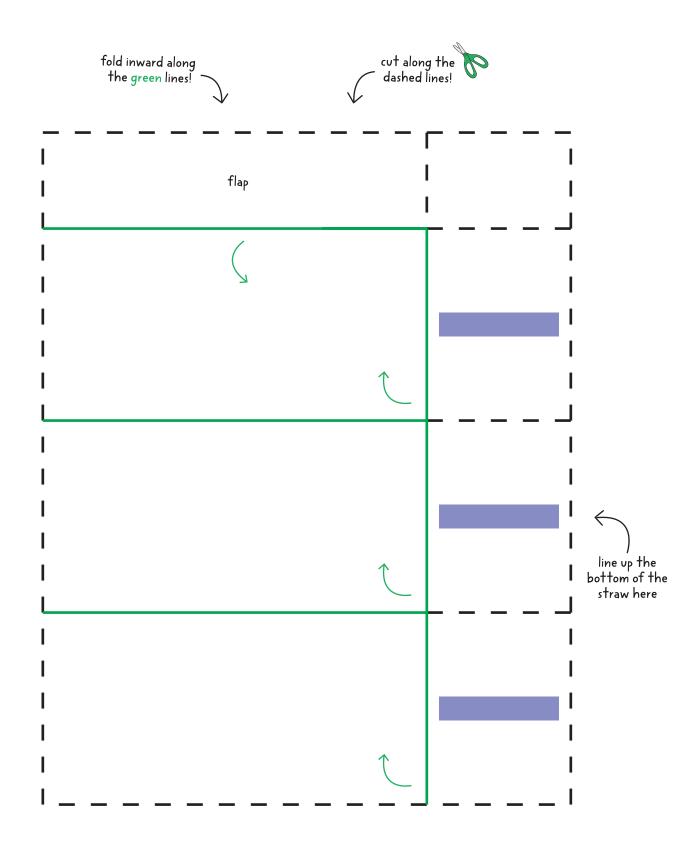
Fold the three top flaps outward to separate the straws.

Try this!

To use your robot hand, hold onto the cardboard section and pull on the strings. Try to grab some small objects with the straw fingers!

- Try pulling all the strings at once or one at a time. What makes it easier to pick things up?
- Try looping rubber bands onto each straw finger. Can you grab more things that way?





Try, try again!

A design challeng	le like this grabber seldom work
perfectly on the fi	rst attempt. So get ready to
☐ try it	test it
tweak it	repeat it
until you get it rig	ht.

Engineers have a name for this process: iterative design. They use it to try out solutions, learn, and improve — just like you're doing.

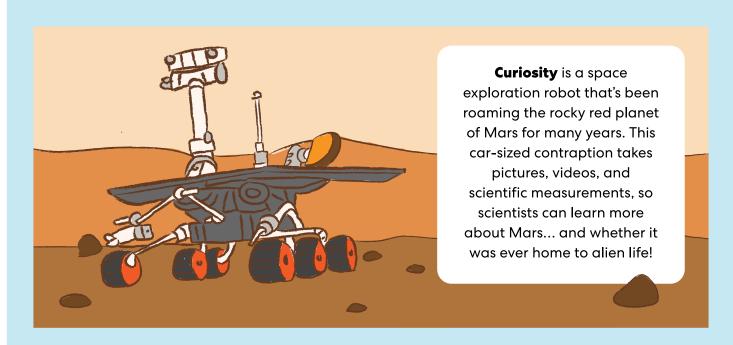
To improve your grabber, you might want to make it more precise, so it can pick up something teeny-tiny. You could test out smaller straws, or make the straw "fingers" shorter, or make the cuts in a different place.

Or you might want to make your grabber super strong, so it can pick up heavier objects. You could try getting rid of the straws entirely and make the "fingers" out of cardboard.

And the best part of iterative design? **There's no such thing as a mistake!** Every test — whether it works or not —
is a chance to learn something new. Try it and see!



Robot Drawing Cards



Think of a faraway place you'd like to study and explore. Draw a robot that could help you.



In car factories across
the world, robots help weld
metal parts together and
make sure the finished
vehicles are strong and
safe. These **welding robots**can work a lot faster
than human workers. And
bonus — they don't need
to wear safety goggles!



If you could start a factory, what would you build there? Draw a building robot.





Robot vacuums are lean, mean cleaning machines.
They roll and spin across the floor until it's spick-and-span.
They can even sense and steer around obstacles like tables, or stop at the top of the stairs so they don't come crashing down.

What's your least favorite chore?

Draw a robot that could do it for you!

