CREATOR'S BOOKLET

CircuitMess
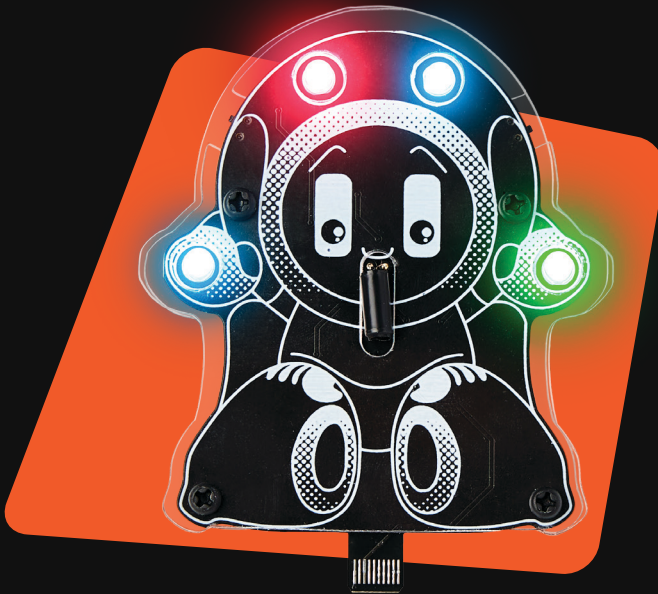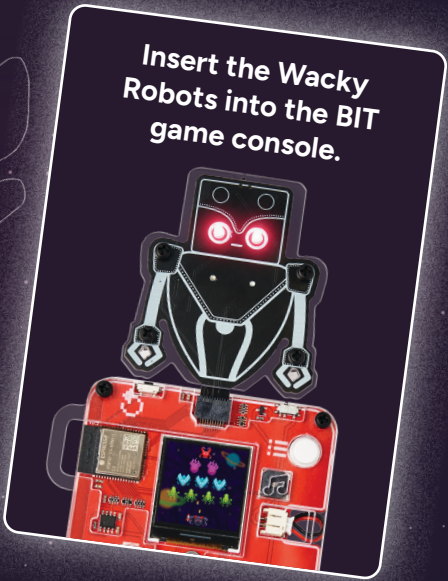
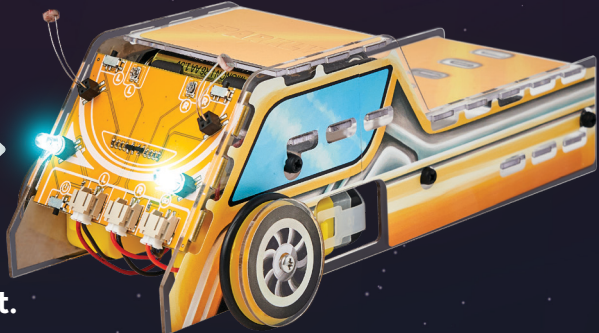# Enhance your STEM knowledge with the CircuitMess toy collection!

Wacky Robots are a quirky group of mini-robots that will help you master the basics of robotics and electronics.

Collect all the Wacky Robots and unlock new games for the BIT!

Connect your robots to Sparkly, a robot car that follows the source of light.

Sparkly, BIT, and Wacky Robots are sold separately.

Meet Robby

Introducing Robby, a DIY
Wacky Robot that will introduce
you to the exciting world
of robotics and STEM.

With Robby, you'll learn about
different electronic components,
vibration sensors, and LEDs.
At the end, you'll have a cool robot
that lights up while being shaken!

How does it work?

Assemble your
Wacky Robot

Learn about vibration
sensors and LEDs

Turn Robby on
and have fun

What is CircuitMess?

CircuitMess started in 2016 when Albert (our CEO) was 17.

Albert loved tinkering with electronics, and one of his first projects was a DIY game console.

People liked the idea, so he launched it on **Kickstarter**, which raised $100,745!

After that, CircuitMess was born. We are a small and fast–growing team of tech lovers who wish to share our love of creating new technology with the rest of the world!

Albert

All of our kits are developed, manufactured, and packed in Croatia!

Behind the name

Circuit Mess

electronic circuits

creative mess in our heads

The mission

Everybody knows how important technology is, but less than 1% of the population knows **HOW TO MAKE** new technology.

We're here to change that! With our kits, we want to inspire people to be **CREATORS** instead of just consumers.

What's inside the box?

1. PCB
2. Screwdriver
3. Coin battery
4. Acrylic casings
5. LEDs
6. Plastic bolts
7. Plastic standoffs

You'll learn about:

Electronics and different electronic components

LEDs

Vibration sensors
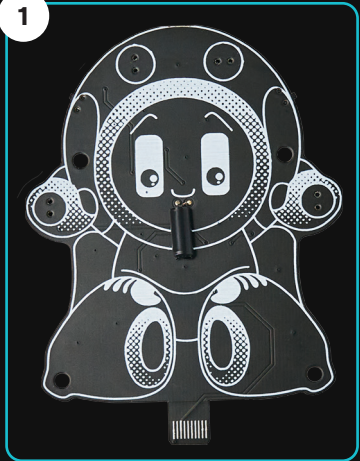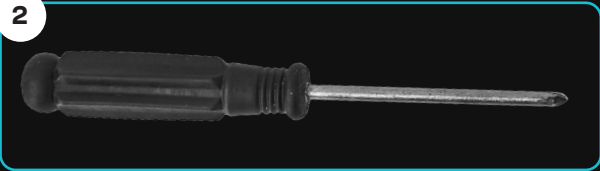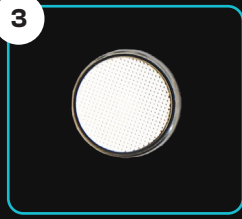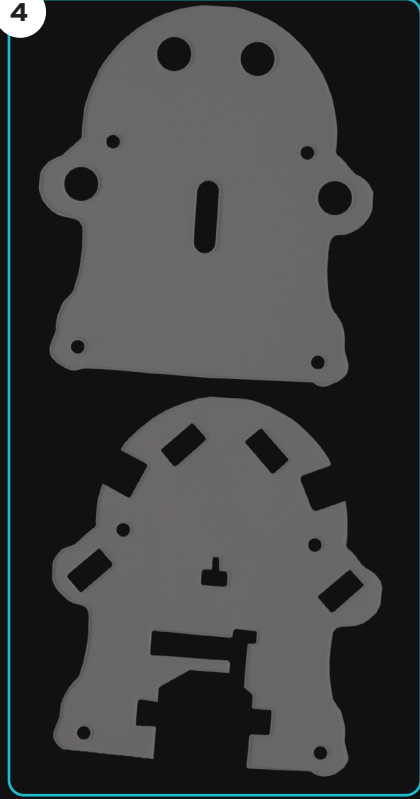
Shake Things Up with Robby's Tilt and Vibration Sensors

Robby is not your ordinary robot – he's equipped with tilt and vibration sensors to react to motion and movement.
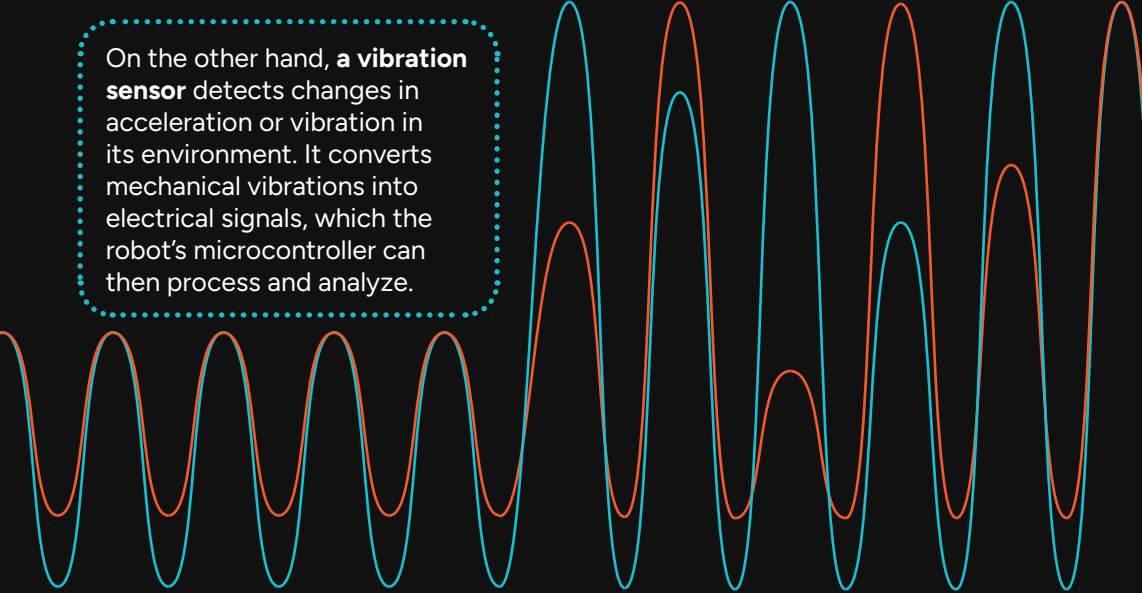
But what exactly are tilt and vibration sensors, and how do they work?
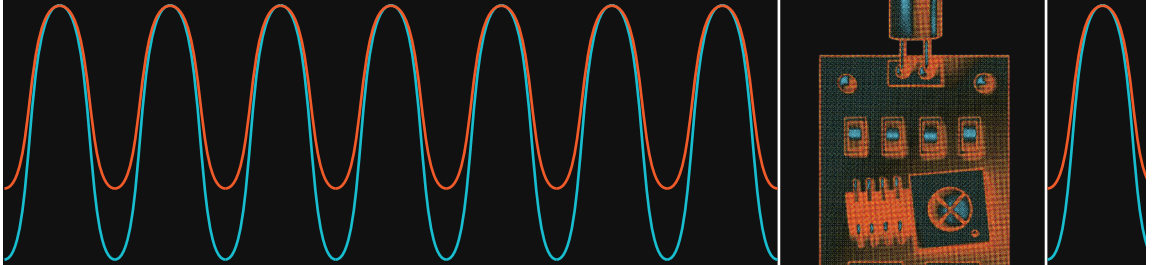
A tilt sensor, also known as a tilt switch, is an electronic component that detects changes in orientation or inclination.

It works by using a small metal ball or a mercury switch that is suspended in a conductive liquid.

When the sensor is tilted or moved, the ball or mercury switch contacts two metal contacts inside the sensor, completing an electrical circuit and triggering a response.

On the other hand, **a vibration sensor** detects changes in acceleration or vibration in its environment. It converts mechanical vibrations into electrical signals, which the robot's microcontroller can then process and analyze.

In Robby, both the tilt and vibration sensors are programmed to recognize when he is being shaken or moved, causing him to light up in various colors and respond to the movement. This adds a fun and interactive element to Robby's design, allows users to engage with him in new and exciting ways.

Tilt and vibration sensors are commonly used in various applications, from toys and games to industrial equipment and automotive systems.

They are simple and effective ways to detect changes in orientation and movement and can be combined with other sensors to create complex designs.

Tilt Sensors in Everyday Life

Tilt sensors are not only found in educational STEM kits and robots like Robby, they are also widely used in many everyday products and gadgets.

Here are some examples of how tilt sensors are used in different areas of our lives:

GAMING

Tilt sensors are used in Nintendo Switch Joy-Con controllers, allowing players to use motion controls and tilt the controller to steer in racing games or aim in shooting games.
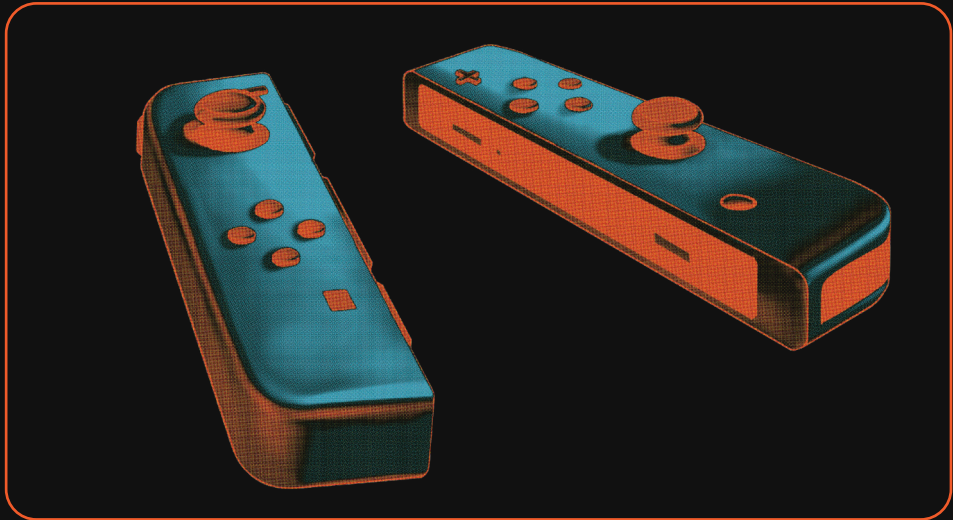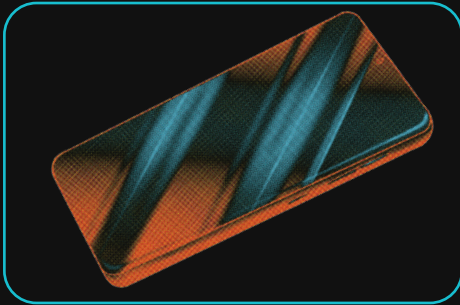
SMARTPHONES

Many modern smartphones feature tilt sensors, which automatically adjust the screen orientation based on how the phone is held. Tilt sensors also enable motion-controlled games and apps.

FITNESS TRACKERS

Fitness trackers and smartwatches often use tilt sensors to detect when the wearer is moving or exercising. This allows them to track steps taken, calories burned, and other fitness metrics.
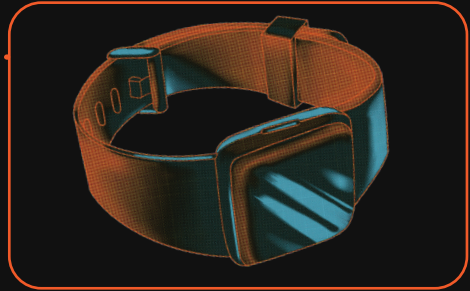
DRONES

Tilt sensors stabilize the aircraft and keep it level in flight. This allows for smoother, more controlled flight and helps prevent crashes.
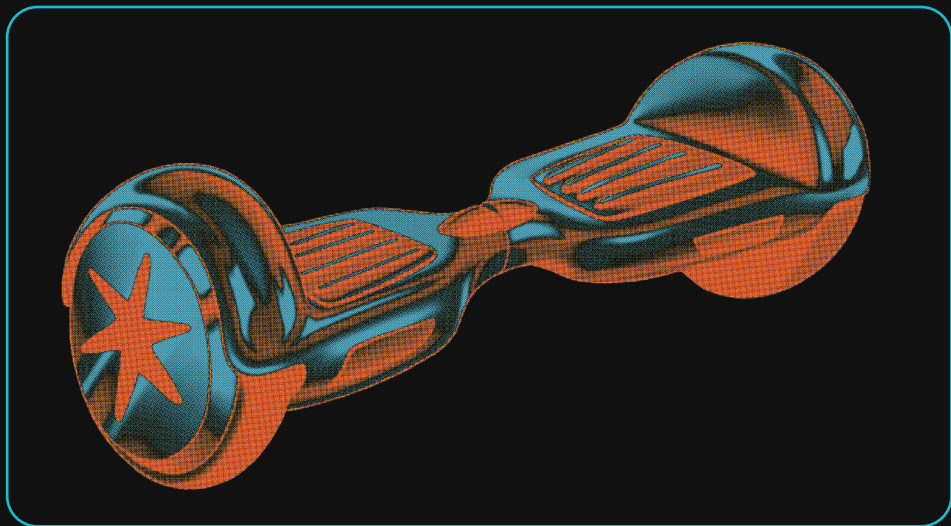
SELF-BALANCING SCOOTERS

Self-balancing scooters, also known as hoverboards, use tilt sensors to detect the rider's movement and adjust the scooter's speed and direction accordingly.

These are just a few examples of how tilt sensors are used daily. With so many applications, tilt sensors are a crucial technology that enhances the functionality of many products and gadgets we use daily.

Powering Up: The History and Types of Batteries

Many products use batteries, and so does Robby. But have you ever wondered about the history of batteries and how they work?

Alessandro Volta

Zinc

Copper

Electrolyte

Voltaic pile
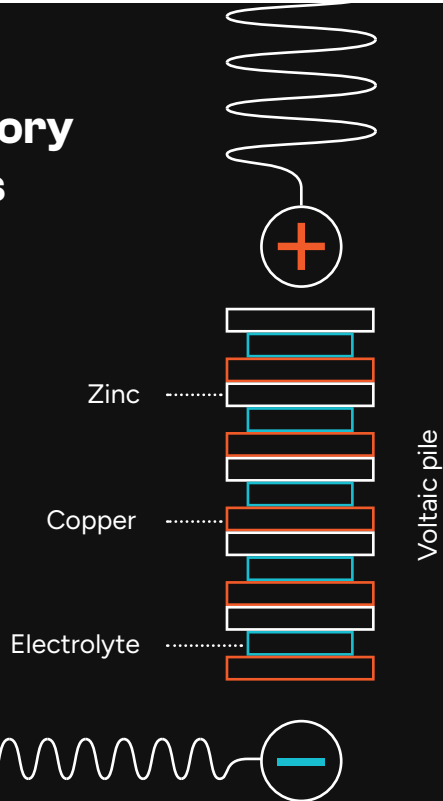
The concept of a battery can be traced back to ancient times when people discovered that certain materials, such as copper and iron, could produce an electric current when brought into contact with certain liquids.

However, in the 19th century, Italian scientist Alessandro Volta invented the first actual battery. Volta's invention, the Voltaic Pile, consisted of alternating disks of zinc and copper separated by pieces of cardboard soaked in saltwater.

Today, many types of batteries are available, **each with unique properties and applications**. The most common types of batteries are **alkaline batteries**, which are used in a wide range of products, from toys to remote controls and flashlights.
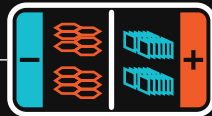
Lithium-ion batteries are another popular type of battery known for their **high energy density and long lifespan**. These batteries are commonly used in smartphones, laptops, and electric vehicles.

Batteries can also be classified based on their size and shape. The most common battery sizes are **AAA**, **AA**, **C**, **D**, and **9V**. These sizes are standardized by organizations such as the International Electrotechnical Commission (IEC) and the American National Standards Institute (ANSI), making it easy to find the right battery for your device.
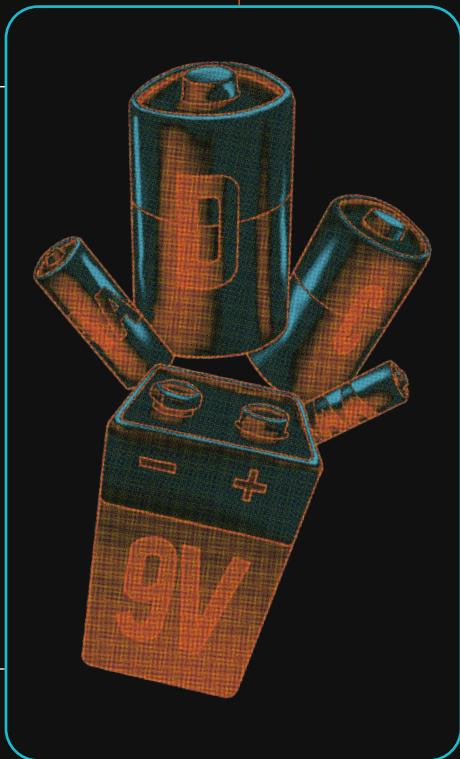
When it comes to Robby, he uses a small 3V button cell battery to power his LED lights and tilt sensor.

This type of battery is commonly used in small electronic devices and can be easily replaced when needed.

Sparks of Innovation: Advances in Car Battery Technology

Electric cars are becoming increasingly popular as **people seek greener alternatives** to traditional gasoline-powered vehicles. But how do these cars run without any fuel? **The answer lies in their batteries**.

Unlike traditional cars that use gasoline to power an internal combustion engine, **electric cars use rechargeable batteries** to power an electric motor. These batteries are **large and powerful**, capable of delivering the energy needed to propel the car down the road.

Car batteries are a concept that has been introduced previously. The first electric car was built in the 19th century and used a battery to power its motor. In 1884, British inventor Thomas Parker made the first practical electric car. A lead-acid battery powered it and could travel up to 18 miles on a single charge.

Thomas Parker's electric car
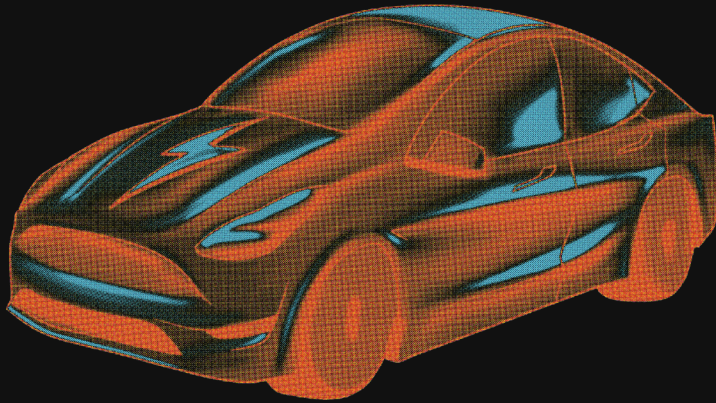
Today, car batteries have come a long way since Parker's invention. Modern **electric cars can travel hundreds of miles** on a single charge, making them a practical and eco-friendly option for many drivers. Additionally, advances in battery technology have made electric cars more affordable and accessible than ever.

Overall, batteries have **revolutionized the way we power our vehicles**. From tiny toys to electric cars, they have become an essential part of our daily lives and will continue to play a significant role in the future of transportation.

Did you know?

Did you know that the **largest battery in the world** is currently under construction in the UK?

The Minety Power Project is expected to have a capacity of 350 megawatts, which is more than **double the size** of the previous record holder, the Hornsdale Power Reserve in Australia. Once completed, the battery will **power up to 300,000 homes for two hours**.
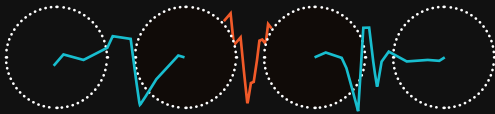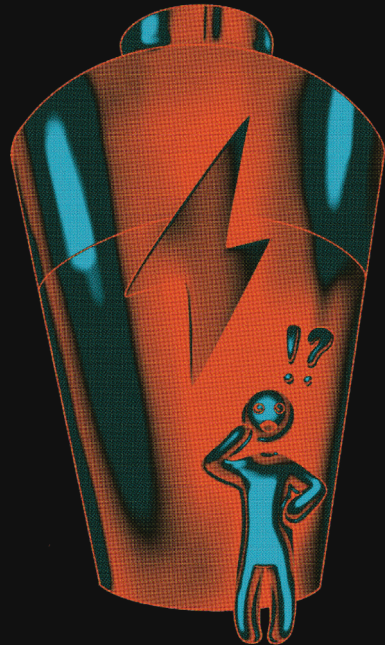
Safety first

Before you start with the assembly, pay attention to the following safety measures:

1 Handling a screwdriver is not recommended for children under the age of 7!

2 **Keep the Wacky Robots kit away from young children! This product contains small components that are dangerous to children under the age of 3.**

3 If you are a minor, assemble Robby strictly with the help of an adult.

Closely follow all the instructions you received in this kit and those found on our online pages so that no one gets hurt.

If you have never used a screwdriver, carefully follow the assembly instructions on our website and, if necessary, ask someone more experienced or older than you to help you.

If you are having problems with our kit, contact our customer support via email at contact@circuitmess.com.

ROBBY BUILD GUIDE

To get two smaller casings from the kit, you'll need to break one large acrylic piece.

But please, **be super careful** when doing this to make sure you don't damage the parts you need.
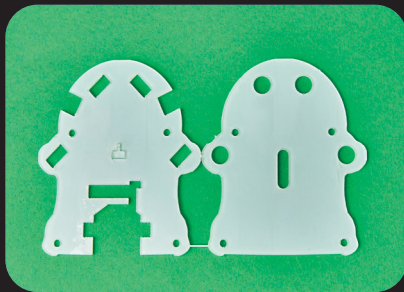
After breaking it, you'll end up with **two separate pieces** of acrylic casings. If you find there's too much excess acrylic in the holes of the casings, just gently push it out.

Remove the protective foil from both sides of the casings now.

Your casings should be all nice and transparent now.
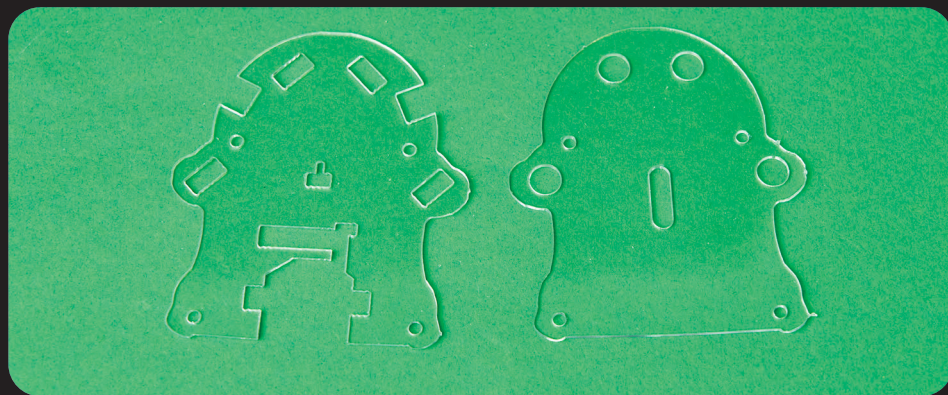
Now, let's dive into the exciting assembly part!

Start by grabbing the **casing** that matches the one in the photo below and gently place it onto the **PCB**.
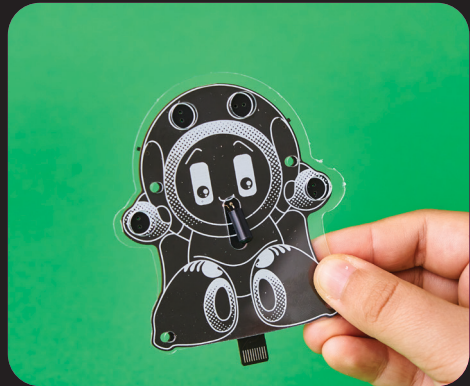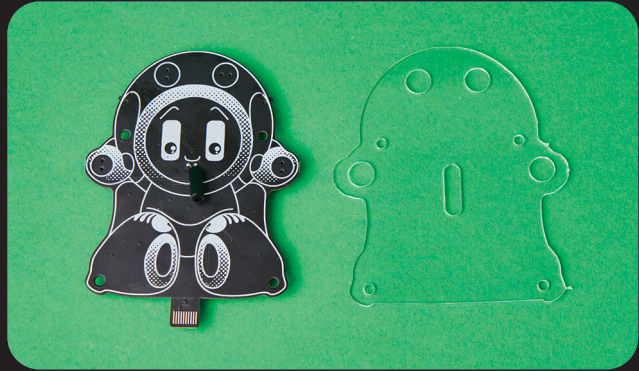
Now, for the next step, put the second casing on the backside.
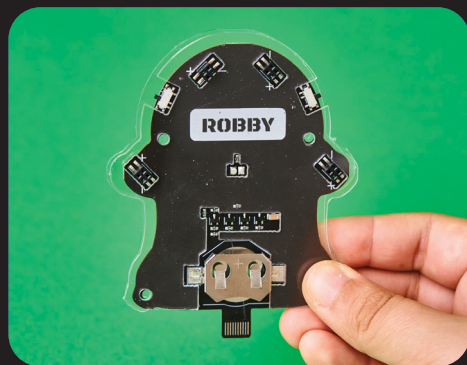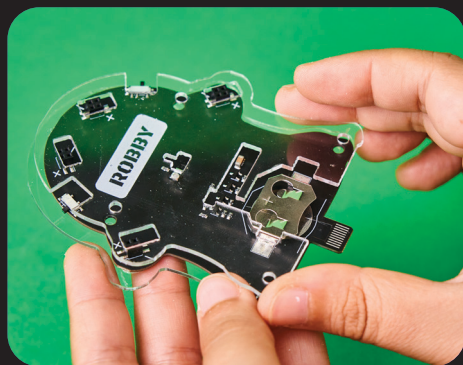
To make sure everything stays in place, we'll need to secure these **casings** with **bolts** and **standoffs**.
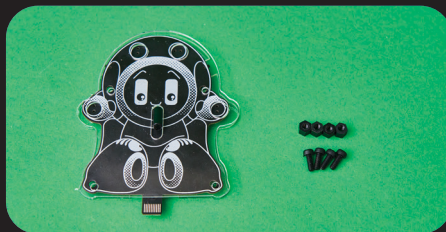
Here's how you do it: **put the bolts in from the front and add the standoffs onto the back.**

Fasten the standoffs with your fingers – no need for fancy tools!
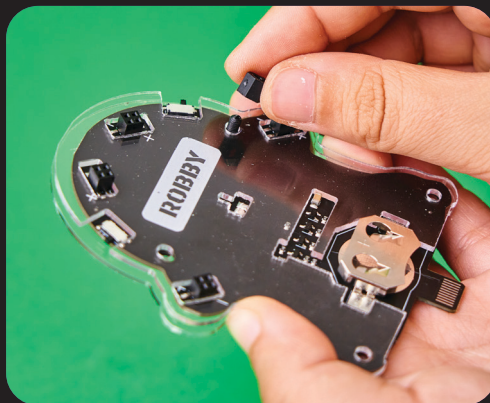
This is what Robby should look like after you put on all of the bolts and standoffs.
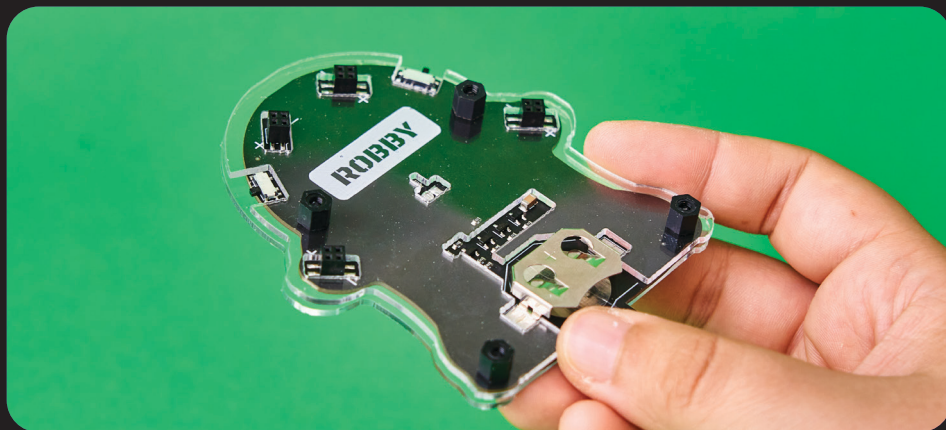
Grab the coin battery and carefully place it on the backside **(make sure the + symbol on the battery matches the + sign on the board - front and up)**.
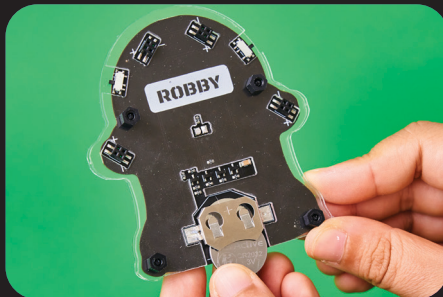
Let's bring Robby to life with some LEDs!

You get to choose which LEDs you'd like to add to Robby, so go ahead and pick your favorites.

It's important to pay attention to the polarity of the LEDs as you connect them.

Flip Robby around, and you'll spot those **+ and - signs next to each connector**. These symbols make it super easy to get the **polarity** right.

Plus and minus signs on the LED are marked with cut-off (-) and rounded (+) parts on the LED.

+
Rounded
part

–
Cut-off
part

+
Rounded
part

–
Cut-off
part
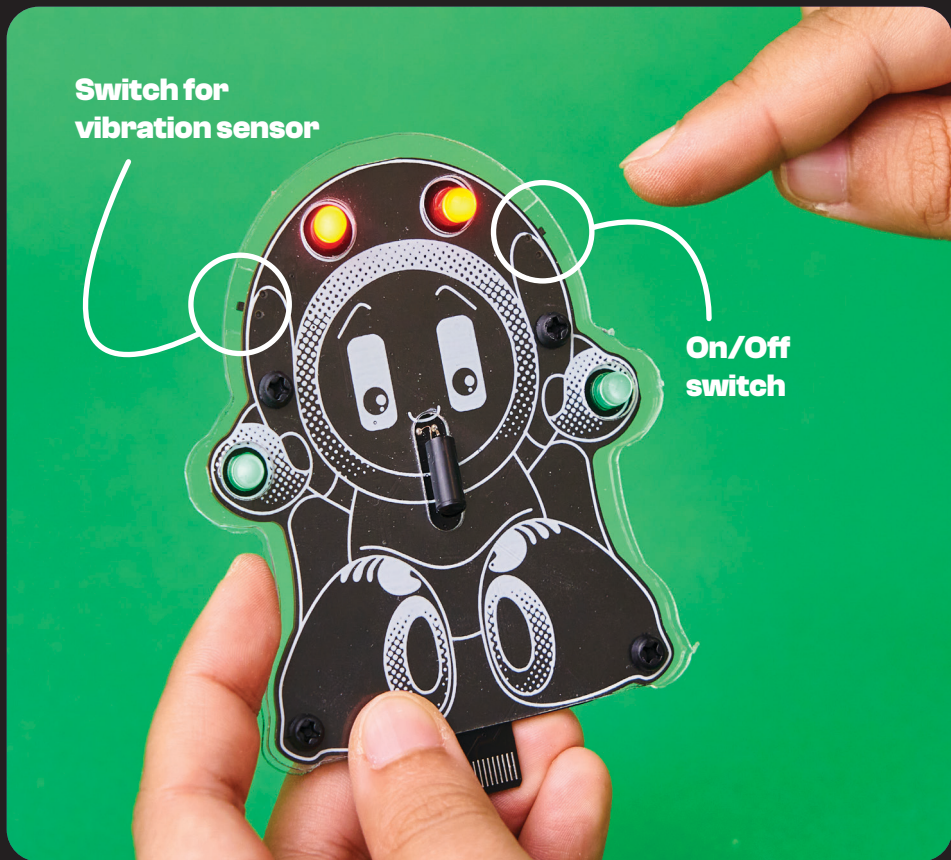
Switch for vibration sensor

On/Off switch

Click the switch on the right, and the LEDs on Robby's hands will light up and stay on until you decide to turn them off.

Now, for a real fun surprise, click the switch on the left and give Robby a little shake. His head LEDs will light up and gradually fade off, but don't worry, shaking Robby again will turn them back on!
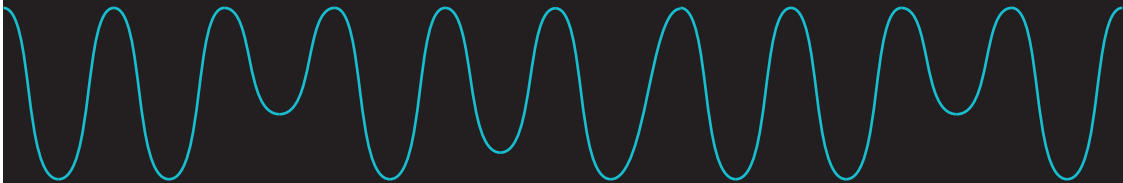
We hope you had a blast putting Robby together and maybe even picked up some new tricks along the way.

And hey, here's a bonus: Connect it to the CircuitMess BIT and unlock a new game!
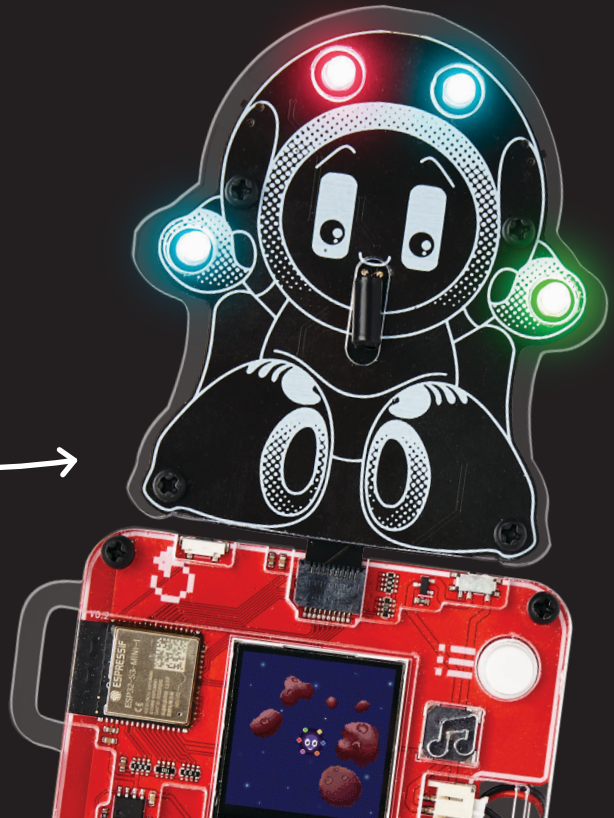
*BIT is sold separately

Thank you for purchasing CircuitMess Wacky Robots Educational kits

For more information and detailed instructions on assembling and using your device, visit our official website: circuitmess.com/resources/guides

Important safety information for CircuitMess Wacky Robots

Read all safety information before using the device.

WARNING: Failure to follow these safety instructions could result in fire, electric shock, injury, and damage to your device or other objects. Read all safety information before assembling and using this device.

This product is a do–it–yourself device, and for it to work properly, you must assemble it according to the instructions you'll find on our website.

If you are a minor, assemble it only under an adult's supervision to avoid potential risks.

CircuitMess Wacky Robots kit contains sensitive electronic components. CircuitMess Wacky Robots or its components may be damaged if dropped, burned, punctured, crushed, or in contact with liquid. If you suspect that any part of your CircuitMess Wacky Robots kit (especially the batteries) is damaged, stop using the device. Using a damaged device may cause injury.

Use only authorized accessories compatible with your device and/or the supplied tools.

The device's operating temperature ranges from 0 ° C ~ 40 ° C.

Using this device in conditions outside this temperature range may damage the device.

Please turn off CircuitMess Wacky Robots after use and store it in a safe and dry location.

The included battery must be recycled appropriately and/or disposed of separately from household waste.

Improper handling of batteries can cause a fire or explosion. Dispose of or recycle

your device, battery, and accessories according to local regulations.

The included battery is NOT rechargeable.

• Do not short–circuit the battery

• Improper use of the battery can cause overheating, burns, or other injuries.

• Do not leave the battery directly exposed to intense sunlight.

• Do not use the device or the battery in high–temperature conditions. Overheating may cause an explosion.

• Do not disassemble or damage the battery to avoid battery leakage, overheating, or explosion.

• In the case of deformation, stop using the battery immediately and dispose of it properly.

If you are not sure whether your device or the included battery is safe to use, turn off the device, put it in a safe place, and contact our customer support via email at contact@circuitmess.com.

Keep the device dry.

Do not attempt to repair the device by yourself.

If any part of the device does not work correctly, contact our customer support (contact@circuitmess.com) or take your device to a certified repair shop.

Connect other devices according to their operating instructions. Do not connect incompatible devices to this device.

Precautions

During prolonged use, Wacky Robots may rarely overheat.

Keep CircuitMess Wacky Robots in a ventilated room during the use and assembly. Pay special attention to this if you suffer from a physical condition that affects your ability to detect heat on your body.

Assembling or using CircuitMess Wacky Robots in an area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapors, or particles (such as dust or metal powder), can be dangerous.

Exposure of CircuitMess Wacky Robots to environments with high concentrations of industrial chemicals, including liquefied gases that evaporate, such as helium, can damage the functionality of CircuitMess Wacky Robots.

Do not use CircuitMess Wacky Robots in hospital operating rooms or intensive care units.

Contact your doctor or our customer support (contact@circuitmess.com) to determine if the device's operation may compromise the work of medical devices.

To avoid possible interference with a pacemaker, maintain a minimum distance of 15 cm between the CircuitMess Wacky Robots and the pacemaker. To achieve this, do not carry the included device in your pockets.

Do not use CircuitMess Wacky Robots near hearing aids or similar medical aids and equipment to avoid interference with medical equipment.

Check aircraft safety regulations and turn off CircuitMess Wacky Robots on the aircraft if necessary.

Do not use CircuitMess Wacky Robots while driving.

To avoid lightning strikes, do not use CircuitMess Wacky Robots outdoors during storms.

Do not use the CircuitMess Wacky Robots in high-humidity environments

such as bathrooms. Failure to do so may result in electric shock, injury, fire, and damage to the product, electronic components, power adapter, or other parts of this electronic educational kit.

Follow all the rules that limit the use of portable electronic devices in some situations and conditions.

The individual parts and components in the CircuitMess Wacky Robots can pose a choking risk to children under 36 months. Keep all components, tools, and parts of this product away from small children before and after assembling the device.

Additional Recommendations and Precautions for Parents, Guardians, and Teachers Buying CircuitMess Wacky Robots for Children

1. Carefully follow the instructions for adequately assembling CircuitMess Wacky Robots. Keep these and all other instructions that came with the products in a safe place.

2. Supervise your child while assembling and using the CircuitMess Wacky Robots. Your responsibility is to ensure that the child uses the CircuitMess Wacky Robots correctly and that the CircuitMess Wacky Robots are suitable for the child's age and abilities.

3. Check from time to time if CircuitMess Wacky Robots are damaged or worn out in any way to prevent possible injuries and risks to the child's health and safety. If CircuitMess Wacky Robots is damaged, remove it immediately.

4. Remove any unnecessary packaging, but keep the instructions. Take care that children do not play with any plastic packaging as there are suffocation risks.

5. Teach children to always store CircuitMess Wacky Robots and other parts of the CircuitMess Wacky Robots educational kit appropriately to prevent accidents. Do not leave CircuitMess Wacky Robots on stairs or on the floor in your home or classroom where someone can step on them.

6. Always report a product security issue to our customer support (contact@circuitmess.com)

Declaration of Conformity

CircuitMess d.o.o. declares that these DIY educational kits CircuitMess Wacky Robots model complies with the essential requirements and all other relevant provisions of Directive 2014/53 / EU. The full text of the EU declaration of conformity is available at the following Internet address: circuitmess.com/certification.

Legal Information

These devices can be used in all EU Member States. Check all the national and local regulations about using the device. These devices may be restricted for use, depending on local laws.

Manufacturer:

CircuitMess d.o.o.

Ventilatorska cesta 24,

10250 Lučko,
Zagreb,
Croatia
OIB: 50943449035

Proper disposal of this product

WEEE markings on the product indicate that this product may not be disposed of with the rest of your household waste in the EU. To prevent possible damage to the environment or human health from uncontrolled waste disposal, recycle the product responsibly. Recycling promotes the sustainable reuse of resources. For more information on the disposal of electrical and electronic equipment, don't hesitate to contact your local household waste disposal service, the store where you purchased the kit, or our customer support (contact@circuitmess.com).

IMPORTANT! Warranty conditions:

The warranty is valid only if the original invoice is attached to the product as proof of purchase during the complaint. If the customer sends the product for repair for any reason not covered by the warranty, the customer may be charged for inspection and testing and delivery costs.

WARRANTY STATEMENT

CircuitMess d.o.o., with its registered office in Zagreb, Croatia, Ventilatorska cesta 24, guarantees the quality and proper functionality of the components that come in the CircuitMess Wacky Robots DIY educational kits for a duration of 24 months from the date of purchase.

If the assembled device does not work correctly due to defects in supplied parts or electronic components supplied in the CircuitMess Wacky Robots DIY educational kits, CircuitMess d.o.o. will repair the product or send an equivalent replacement product at their own expense.

In case you are experiencing assembly or functionality difficulties with your device, please contact us via email (contact@circuitmess.com).

Please include a detailed description of the problem.

If you are sending the product to a repair shop, it is recommended to deliver the product in the original packaging to protect it from potential damage during transportation.

WARRANTY CONDITIONS

The warranty period begins on the day of sale indicated on the invoice.

The warranty is valid upon presentation of the original invoice.

If the defect is not remedied within a reasonable period after receiving the product for repair, CircuitMess d.o.o. will replace it with a new product.

The repair shop does not take responsibility

for storing and/or losing personal
data while repairing the device.

WARRANTY DOES NOT COVER

Upgrades, alterations, modifications to
hardware and/or software without the
written consent of CircuitMess d.o.o.

Malfunctions due to improper handling,
faults due to wear of the device and/or
its parts (in you need help with assembly
or if you have difficulty using the device
after assembling it, please contact
us at contact@circuitmess.com).

Defects caused by external particles
(including, but not limited to: staples,
waste, dust, food) and external
factors (including, but not limited to:
moisture, water, thermal damage).

Mechanical damage and/or failures
caused by mechanical damage.

Use of the product for a purpose
for which it is not intended.

Requirements for the appearance, technical
functionalities, and/or capabilities of
the product outside the manufacturer's
specifications and/or standards.

Damages to personal data, other tangible and/
or intangible assets of the buyer and/or third
parties, indirect damages, lost profits caused
by the use of the product, and/or its failure.

Repairs in an unauthorized repair shop and/
or installation of non–original spare parts.

Damage caused during transportation
caused by improper packaging.

The rights under this warranty are the
exclusive and final rights of the customer
unless otherwise provided by national law.

CircuitMess d.o.o. as the warranty provider
and/or its authorized partners will not
be liable for any defect, damage, loss,
direct or indirect cost, or connection
with the delivered products outside the
warranty conditions written here.

This warranty does not affect other
rights of the customer belonging
to him on other legal grounds.

WARRANTY SHEET

Product name:	CircuitMess Wacky Robots do-it-yourself educational solder kit
Warranty on components and parts contained in this set is:	24 months
Date of purchase:	
Seller and point of sale stamp:	
Invoice number:	

Information on interventions during warranty period is entered
by a repair shop technician at an authorized repair shop.

Received on	Issued on	Fault description	Warranty extension

Manufacturer:
CircuitMess d.o.o.
Ventilatorska cesta 24,
10250 Lučko,
Zagreb,
Croatia
Country of origin: Croatia
www.circuitmess.com

Authorized repair shop:
CircuitMess d.o.o.
Ventilatorska cesta 24,
10250 Lučko,
Zagreb,
Croatia
Country of origin: Croatia
www.circuitmess.com

Č~ CircuitMess

CE FC

WARNING:
Not for children
under 3 years.

Scan and find more fun games and lessons: