

GLOW BEETLE SOLDERING KIT

INSTRUCTION MANUAL



BUILD IT · SOLDER IT · WATCH IT GLOW!

Unlock the Joy of Creation with Soldering!



• Soldering

Soldering is a fun skill that lets you turn ideas into real working projects. It helps you build confidence, improve focus, and develop fine motor skills – all while creating something amazing with your own hands.

• Glow Beetle Kit

Your Glow Beetle Soldering Kit is the perfect place to start. Designed for beginners, it guides you step-by-step until you finish a working light-up beetle and get that proud "I did it!" moment.

• Safety

Warning: This soldering kit is not a toy. It is recommended for ages 10 and up and should only be used with adult supervision. The soldering iron gets extremely hot and can cause burns. Always follow the safety instructions carefully and never leave the iron unattended while it is plugged in.

Be safe and have fun on your soldering adventure!



SUPPLIES LIST



Dikes

*Not included with Kit



Eye Protection

*Not included with Kit



✓ Glow Beetle Kit



✓ Solder Wire



✓ Sponge (Wet with water)



✓ Soldering Iron (Assembly Required)

STEP
1



Unscrew one of the nuts from the bolt.

STEP
2



Push the bolt through the hole in the black base. Screw the nut back onto the bolt. Tighten it with pliers or a hex driver so it feels very secure and won't twist or wobble.

STEP
3



Place the soldering iron and the yellow sponge into the holder on the base. Once everything is secure, plug the iron into the wall outlet to start heating it up.



SAFETY FIRST

WARNING: This product can expose you to lead, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Safety Rules



1. Protect Your Eyes

Always wear safety goggles. Molten solder can spit and is very hot.



2. Use Good AirFlow

Soldering makes a little smoke. Open a window or use a fan so you don't breathe it in.



3. Stay Clean & Safe

Wash your hands with soap and water after soldering. Never eat or drink while soldering, and never put tools or solder in your mouth. Wipe your work area with a damp cloth often to keep it clean. Throw away solder scraps the proper way (ask an adult – they are considered special hazardous waste in some places).



4. Hot Iron Warning

The soldering iron gets extremely hot and can burn you. Always place it back in the holder when you're not using it. Never touch the metal tip, even after it's unplugged. Use a heat-safe mat under your work and have an adult nearby.

Helpful Tips



+/- 1. Polarized Parts

Some parts only work if they face the right way. Look for the words **POLARIZED PART** ⚠ in the instructions and follow the pictures carefully.



2. Using Dikes or Wire Cutters

Always hold the wire when you cut it so pieces don't fly away. Don't cut too close to the board – leave a little bit of wire sticking out.



3. Cleaning the Soldering Iron Tip

Wipe the tip of your iron on the damp sponge after soldering every few joints. If the tip looks brown or dirty, gently scrape it clean with a tool while the iron is hot.



HOW TO SOLDER - STEP BY STEP

In the process of soldering, solder is melted to stick parts together both mechanically (holding them tight) and electrically (so electricity can flow). Follow these steps to make strong, reliable connections.

**STEP
1**

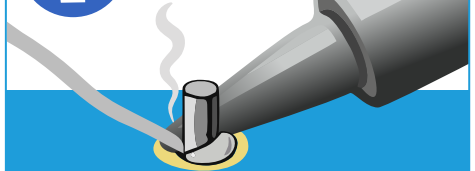
**Heat the Pad and Lead
(2-3 seconds)**



Hold the soldering iron at an angle so it touches both the gold pad on the circuit board and the wire lead at the same time. Heat them for about 2 to 3 seconds. If it's not heating well, put a tiny bit of solder on the tip of the iron and try again.

**STEP
2**

Add the Solder



While the pad and lead are hot, touch the solder wire to the spot where the iron meets the pin. The solder should melt and flow smoothly around the joint. Don't hold it too long or the solder will flow through to the other side and make a big blob.

**STEP
3**

**Remove the Solder,
Then the Iron**



First pull the solder wire away. Then lift the soldering iron straight up. Do this quickly so you get a nice, smooth connection.

**STEP
4**

Let it Cool



Let the joint cool for a few seconds. It is still very hot right after you remove the iron – don't touch it yet.

After soldering, you might see brown or yellow sticky stuff around the joint. This is called flux. It comes from inside the solder wire and helps the solder melt and flow nicely. Don't worry – this is normal! You can gently brush it away with a small cleaning brush if you want.

Solder joints can look a little different depending on how long you heated them, how fast you added the solder, and how much you used.

A good solder joint will be shiny and smooth on the sides – kind of like a small chocolate chip.



SOLDER JOINT EXAMPLES & FIXES



The perfect solder joint looks shiny, covers the whole pad, and is smooth on the sides – kind of like a little chocolate chip. Try to make all your joints look about the same size and shape.



Reheat the joint until the solder melts, then quickly lift the iron away. A little solder will stick to the iron. Clean the tip on the wet sponge, then repeat until the joint looks right.



Reheat the joint and add a little more solder. A joint with not enough solder might work at first, but it won't be as strong or reliable.



A cold joint looks dull or lumpy and the solder didn't fully stick to the pad. It might work for a while, but could stop working if the board moves. Reheat it and add a bit more solder, then remove any extra.



Usually you can just reheat the joint, add a little more solder, and then remove any extra. If you have a flux pen, adding a tiny bit of extra flux can also help.



A bridge happens when solder connects two pins that shouldn't be connected. This creates a short and can make your whole project stop working! Reheat the area and remove the extra solder. You can gently move the iron back and forth between the two pins to help separate them.



GLOW BEETLE PARTS LIST

- **Circuit Board (Qty 1)**

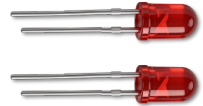
This is the heart of your Glow Beetle! It has silver pads where you will solder the parts. On the back, you'll see thin lines called traces that connect everything together like wires.



*Note: Color may vary

- **LEDs (Qty 2) POLARIZED PART ⚠**

These are tiny lights (Light Emitting Diodes). They use very little energy and are much smaller than regular light bulbs. Important: They must be placed the correct way or they won't light up.



- **47K Loaded Resistor (Qty 1)**

Resistors control how much electricity flows through a circuit. Different kinds have different colored bands. They have wire legs (called leads) that you solder to the board.



- **220ohm Loaded Resistors (Qty 2)**

These resistors have a lower resistance value than the 47K resistor and help control the flow of electricity in the circuit.



- **Transistor (Qty 1) POLARIZED PART ⚠**

This acts like an electronic switch. It helps control when the LEDs turn on and off. Important: It must be placed the correct direction.



- **Photocell (Qty 1)**

This is a light sensor. It changes how much electricity flows depending on how bright or dark it is.



- **Battery Holder (Qty 1) POLARIZED PART ⚠**

This holds the battery and connects it to the circuit board. Important: It must be placed the correct way.



- **Battery (Qty 1) POLARIZED PART ⚠**

This powers your whole Glow Beetle! Put it in the battery holder after you finish soldering.





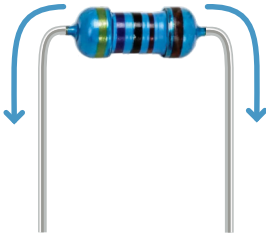
ASSEMBLY INSTRUCTIONS (1 of 7)

47K Leaded Resistor (Qty 1)



Find the 47K Resistor. Look at the colored bands – they should match the picture (green, dark blue, black, etc.)

- 1** **Bend the leads** – Bend both wires down on either side.



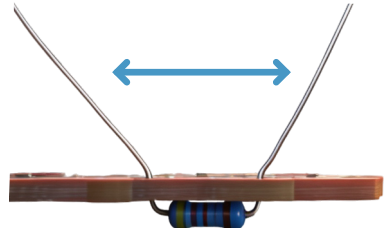
- 2** **Placement** – Look for the place on the circuit board marked "47K".



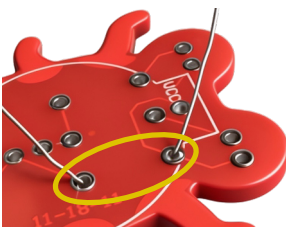
- 3** **Insert the resistor** – Push the leads through the holes and press the resistor flat against the board.



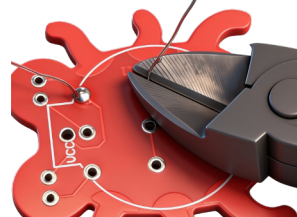
- 4** **Bend the leads** – On the back of the board, gently bend the leads outwards so the resistor stays in place.



- 5** **Solder the pins** – Solder the two pins on the back of the board. (See "Soldering Instructions" on pages 3 and 4 for details.)



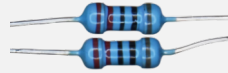
- 6** **Cut the leads** – Use your dikes to cut the long leads. Hold the pins while cutting so they don't fly away. Be careful not to scratch or damage the board.





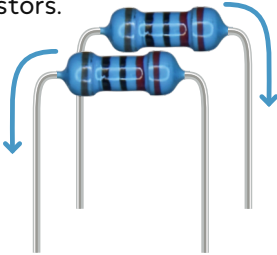
ASSEMBLY INSTRUCTIONS (2 of 7)

220ohm Loaded Resistors (Qty 2)

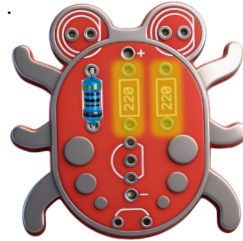


Find the two 220ohm Resistors. Look at the colored bands on them – they should match the picture (two dark red, one dark blue, etc.)

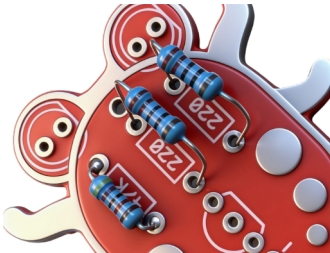
- 1** **Bend the leads** – Bend the wire leads down on each of the two resistors.



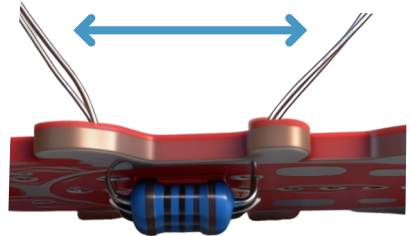
- 2** **Placement** – Look for the two places on the circuit board marked "220".



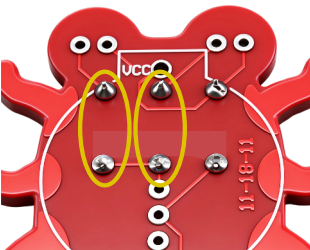
- 3** **Insert the resistors** – Push the leads through the holes and press each resistor flat against the board.



- 4** **Bend the leads** – On the back of the board, gently bend the leads outwards so the resistors stay in place.



- 5** **Solder the pins** – Solder the pins on the back of the board. (See "Soldering Instructions" on pages 3 and 4 for details.)



- 6** **Cut the leads** – Use your dikes to cut the long leads. Hold the pins while cutting so they don't fly away. Be careful not to scratch or damage the board.





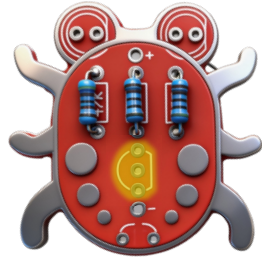
ASSEMBLY INSTRUCTIONS (3 of 7)

Transistor (Qty 1) **POLARIZED PART** ⚠

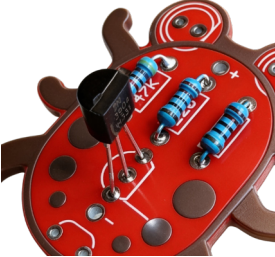


Important: This part must go in the correct direction or your Glow Beetle won't work.

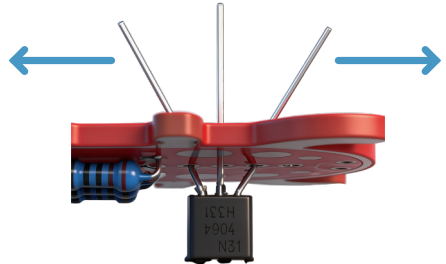
- 1 Placement** – Look for the place on the board marked for the transistor. Match the flat side of the transistor with the flat side of the drawing on the board.



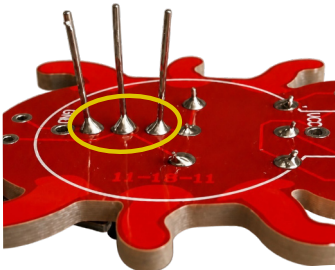
- 2 Insert the transistor** – Push the three leads through the holes and press the transistor down as flat as it will go.



- 3 Bend the leads** – On the back of the board, gently bend the two outside leads outward a little so the transistor stays in place.



- 4 Solder the pins** – Solder the pins on the back of the board. (See "Soldering Instructions" on pages 3 and 4 for details.)



- 5 Cut the leads** – Use your dikes to cut the long leads. Hold the pins while cutting so they don't fly away. Be careful not to scratch or damage the board.





ASSEMBLY INSTRUCTIONS (4 of 7)

Photocell (Qty 1)

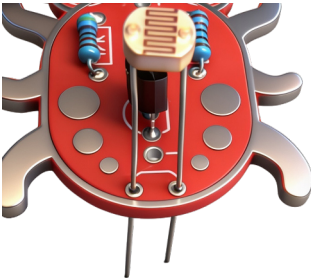
Find the photocell. (Small light sensor)



- 1 Placement** – Look for the place at the bottom of the circuit board where the photocell goes.



- 2 Insert the photocell** – Push the two leads through the holes and press the photocell down until it sits flat and level with the board.



- 3 Bend the leads** – On the back of the board, gently bend the leads outward a little so the photocell stays in place.



- 4 Solder the pins** – Solder the pins on the back of the board. (See "Soldering Instructions" on pages 3 and 4 for details.)



- 5 Cut the leads** – Use your dikes to cut the long leads. Hold the pins while cutting so they don't fly away. Be careful not to scratch or damage the board.

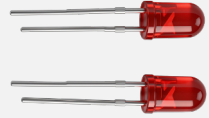




ASSEMBLY INSTRUCTIONS (5 of 7)

LEDs (Qty 2) **POLARIZED PART** ⚠

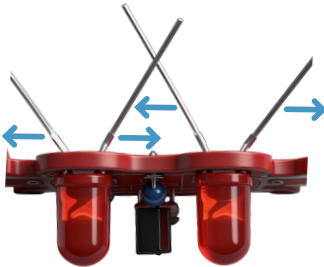
Important: This part must go in the correct direction or your Glow Beetle won't work.



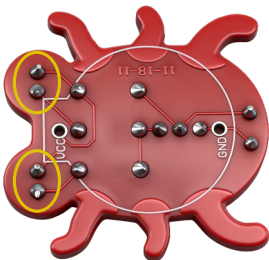
1 Placement – Find the two places on the top of the circuit board for the LEDs. The longer lead goes into the hole marked with a "+" (plus sign).

2 Insert the LEDs – Push the leads through the holes and press each LED down until it sits flat against the board.

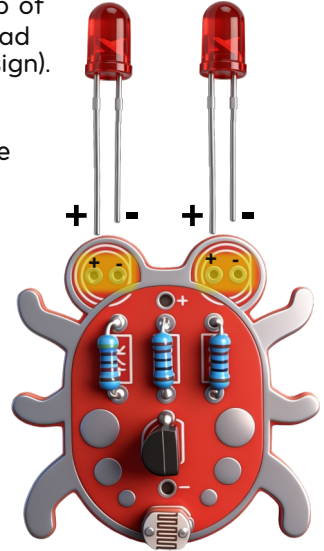
3 Bend the leads – On the back of the board, gently bend the leads outward a little on each LED so they stay in place.



4 Solder the pins – Solder the pins on the back of the board. (See "Soldering Instructions" on pages 3 and 4 for details.)



5 Cut the leads – Use your dikes to cut the long leads. Hold the pins while cutting so they don't fly away. Be careful not to scratch or damage the board.





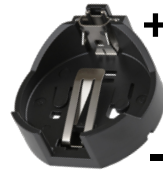
ASSEMBLY INSTRUCTIONS (6 of 7)

Battery Holder (Qty 1) **POLARIZED PART** ⚠

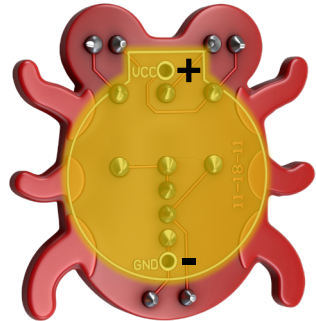
Important Warning: Before you put this part on, carefully check all the solder joints you already made. Make sure the leads are trimmed, the joints look good, and there are no bridges between pins. This battery holder goes on the back of the board and will sit right on top of some of those joints.



- 1 Placement** – Turn the board over to the back side. Line up the battery holder with the outline printed on the board.

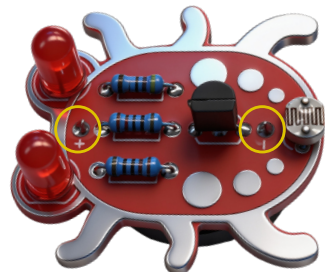


- 2 Insert the battery holder** – Push the two leads through the holes and press the holder down.



- 3 Flip the board carefully** – Hold the battery holder so it doesn't fall out, then flip the board over and set it down.

- 4 Solder the pins** – Solder the two pins. (See "Soldering Instructions" on pages 3 and 4 for details.)





ASSEMBLY INSTRUCTIONS (7 of 7)

Battery (Qty 1) **POLARIZED PART** ⚠️

Find the battery which will power your Glow Beetle.



- 1 Insert the battery** – Place the battery into the battery holder. Make sure the words on the battery are facing up.
- 2 Test your Glow Beetle!** – Cover the photocell (light sensor) with your finger or hand. The two LEDs should turn ON. When you uncover the photocell and let light hit it, the LEDs should turn OFF.



ON

(light sensor is covered)



OFF

(senses light)



Note: – When your Glow Beetle is working correctly, the LEDs will stay on in the dark. When you're not using it, take the battery out so it lasts longer.

Troubleshooting - IF Your Glow Beetle Doesn't Work

- ✓ **Check the Solder Joints** – Look carefully at every solder joint. Make sure each one is shiny and fully connected. Also check that there are no bridges (extra solder accidentally connecting two pins that shouldn't touch).
- ✓ **Check Polarized Parts** – Go back and double-check every part marked POLARIZED. Make sure they are all facing the correct direction. Tip for the LEDs: Even though the leads are cut, you can still check them. Look inside the top of each LED – there is an indicator cut inside.
- ✓ **Check the Photocell** – Make sure the photocell is sitting flat and level against the board. If it is tilted, it may not sense light correctly and the LEDs might not turn on and off properly.



ADDITIONAL ACCESSORIES

• Solder Sucker Tool

This tool helps remove extra solder if a joint has too much or if you need to take a part off the board.

To use it:

1. Press down the big plunger button to set it.
2. Heat the solder you want to remove.
3. Quickly place the tip of the solder sucker on the melted solder and press the side button to suck it up.



• Replacement Tips (for the soldering iron)

Your kit includes extra tips in different sizes for different projects.

Be careful! The soldering iron stays hot for a while even after you turn it off. Always let it cool completely before changing the tip.



• Extra Wire

Use this for other projects or practice soldering.



• Tweezers

Great for picking up small parts or holding something that is still warm.

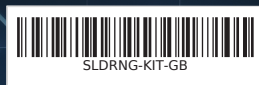


• Wire Stripper

This tool removes the plastic coating from the end of a wire so you can solder it.



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