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⚠ WARNING

CHOKING HAZARD — Small parts.
Not for children under 3 years.

Do not mix old and new batteries.
Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries.

KiwiCo

Our mission is to create seriously fun and enriching hands-on experiences to inspire young innovators.

panda koala kiwi atlas DOODLE TINKER EUREKA MAKER

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Keep the instruction sheet since it contains important information.

KiwiCo

MAKE YOUR OWN

LIGHT-UP WIRE ART

ELECTRONICS + ART

Scanned + Archived By: FindMyManual.org





WHAT'S IN THIS BOOK?

Step-by-step instructions to take you through the complete build, plus **explanations** and **diagrams** to illuminate how everything works.

PAGE

1 What's In This Book

2 Introduction: *This Art Is Lit*

4 Materials List

5 What You'll Make In This Crate

6 **BUILD** | Part A: Try Out The EL Wires

8 **BUILD** | Part B: Make A Design

12 *How Does EL Wire Work?*

14 **BUILD** | Part C: Display Your Art

14 *Build A Stand*

15 *Hang It Up*

17 **BUILD** | Part D: Design Your Own

21 *How Do Neon Lights Work?*

THIS ART IS LIT

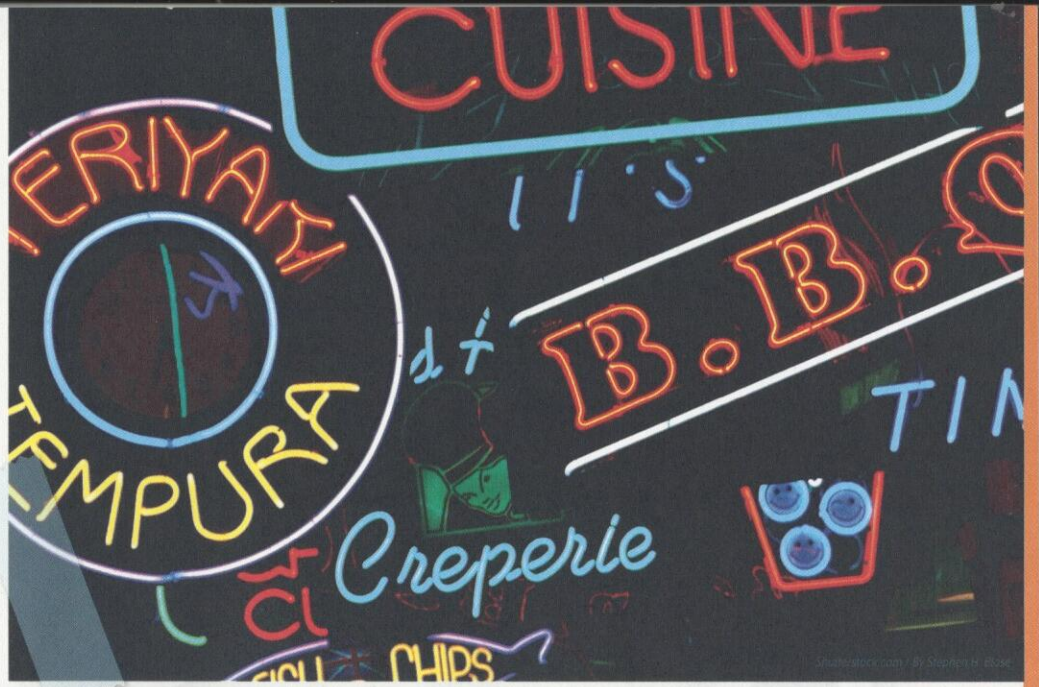


Shutterstock.com / By Graeme Dawes

Learn how neon lights work on page 21.

The projects you are about to make are **inspired by the eye-catching glow of neon**.

Neon is a chemical element, first discovered in 1898 by Sir William Ramsey. At first, this new discovery didn't seem very significant. But when Ramsay applied electricity to neon gas, he described the resulting glow as "a sight to dwell upon and never forget." At his son's suggestion, Ramsay named the element "neon," after the Greek word for new.



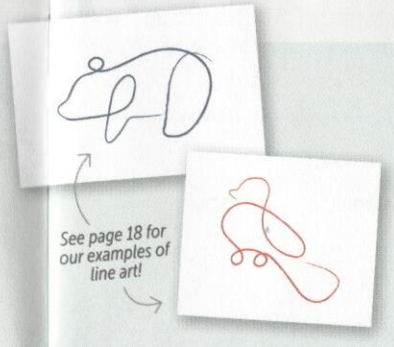
Shutterstock.com / By Stephen H. Bisset

Neon's brilliance made it ideal for advertising. In 1923, a Los Angeles car dealership put up two bright orange-and-blue neon signs — and the sight was so striking it caused traffic jams. Soon every big city had enough neon signs to light up the night, advertising everything from soda pops to barber shops. By the end of the 20th century, neon's heyday as an advertising medium was over. These days, most light-up signs are made with inexpensive plastic panels and high-tech LED screens.

But neon lives on! Vintage neon advertising pieces are highly valued by collectors, and there are even museums dedicated to neon signs. In the world of fine art, people are finding amazing ways to use neon in new works and installations. As an artistic and creative medium, neon's light is shining brighter than ever!

FINE LINE

To make your own glowing art, you'll be working with a single luminous wire. That sounds simple, but you may find it takes some thought to express your design idea in just one line. In the hands of brilliant artists like Pablo Picasso, continuous-line artwork can look clean, modern, and expressive.



See page 18 for our examples of line art!

Now it's your turn! For your first piece, use one of the included design templates to get the hang of creating luminous artwork. For your second project, pick another template or you can design your own single-line design from scratch. Whatever you create, it's sure to be good to glow!

Check out page 17!

MATERIALS LIST

We've included **everything you need** to make two pieces of brilliant electro-luminous art!



EL wires

You'll be designing your glowing art with EL wires. Learn how they work on page 12.



battery packs



batteries



templates



awl



paper cutouts



stand pieces



colored pencil



back cover



blank sheet



twist ties



hang tab



clear stickers



sticky foam squares



sticky foam shapes

GRAB FROM HOME

scissors

blank paper

pencil

WHAT YOU'LL MAKE IN THIS CRATE

First you'll **illuminate your wires.**



Try it out on page 6!

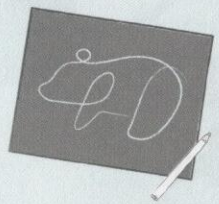


Then **create a glowing design.**

Pick your favorite template on page 8.

Explore two ways to **display your art.**

See page 14 to stand it or hang it.



Choose another template or create your own design and **make it again!**

See how on page 17!

First, try **connecting the wires** to see them glow.

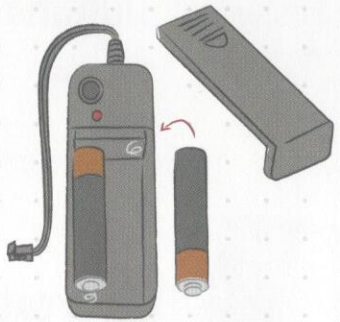
Part A: **Try Out The EL Wires**

On these pages, you'll need:

- ☐ 4 batteries
- ☐ 2 battery packs
- ☐ 2 EL wires

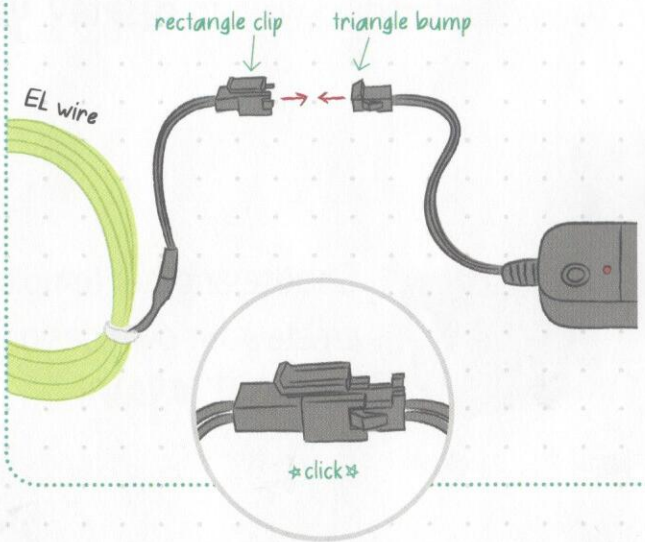
Step 1

Open a **battery pack**, put two **batteries** in, then slide the cover back on.
Do not turn on the battery pack yet.



Step 2

Pick an **EL wire** and find the clip end. Slide it onto the battery wire so the rectangle clip goes on the triangle bump. Push until you feel a click.



Step 3

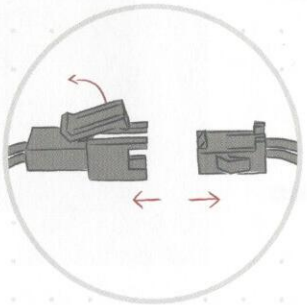
Press the battery pack button to light up the wire. Press the button again to try out the other modes: slow flashing, quick flashing, and off.
Only turn on the battery pack when it's connected to the wire – otherwise you can damage the pack.



The battery pack might buzz when it's on. This is normal!

Step 4

Press down on the rectangle clip on the EL wire and slide the wires apart.



Step 5

Try out the other EL wire and battery pack too.

Pick which one you want to use first and keep going!



Turn a wire into **awesome artwork.**

Part B: **Make A Design**

On these pages, you'll need

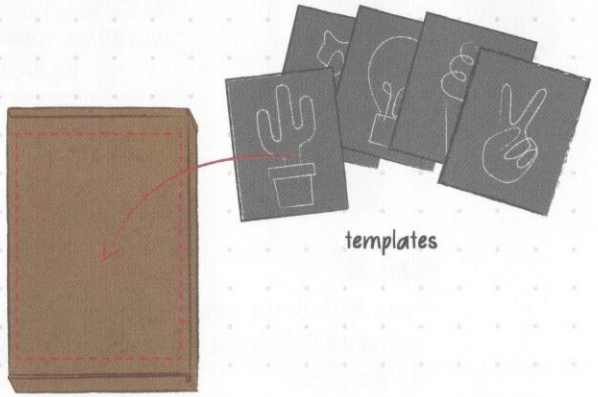
- ☐ EL wire
- ☐ Light-Up Wire Art box
- ☐ template (pick your favorite!)
- ☐ awl
- ☐ twist ties

And from home:

- ☐ scissors

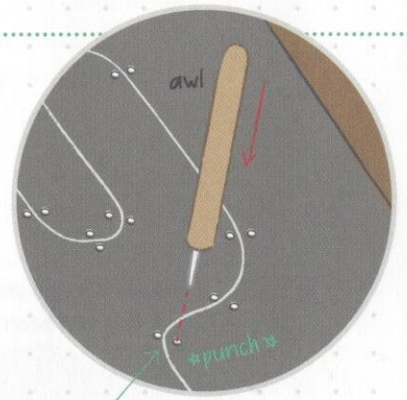
Step 1

Choose one of the **templates** and place it on top of the **box**.



Step 2

Use the **awl** to punch through each of the small white dots. Make sure to push the awl all the way into the crate to make the holes the right size.

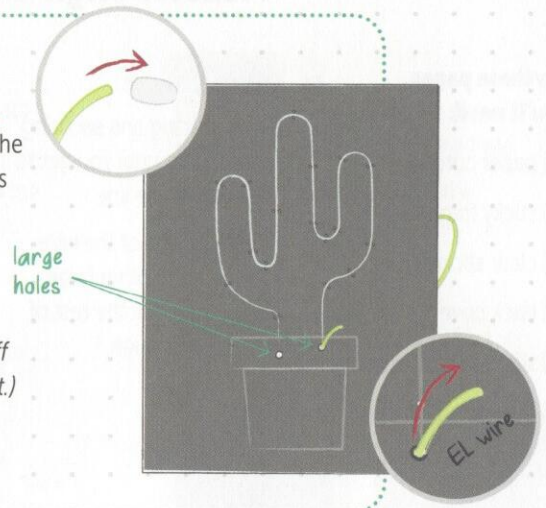


The dots come in pairs! Make sure to punch out both.

Step 3

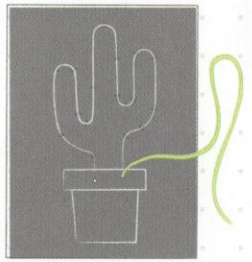
Remove the cap from the end of the **EL wire.** From the back of the template, press the wire through one of the large holes.

(If the cap doesn't come off, you can cut it off with scissors and discard it.)



Step 4

Pull the wire through. Stop when you reach the black part of the wire.

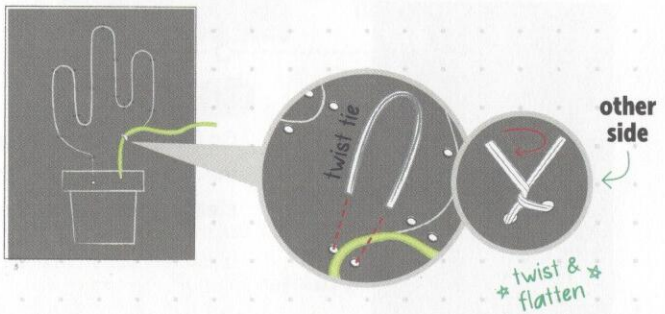


Step 5

Trace the template line with the EL wire.

Poke a **twist tie** through each pair of punched holes to hold the wire in place.

On the back side, twist and flatten the tie ends to secure.



Make A Design (continued)

On these pages, you'll need:

- ☐ paper cutouts
- ☐ sticky foam circles
- ☐ clear stickers
- ☐ back cover
- ☐ sticky foam shapes
- ☐ battery pack (from part A)

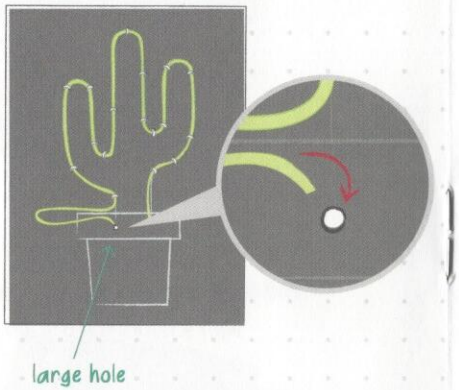
And from home:

- ☐ scissors

Step 6

Keep tracing and securing the EL wire until you get to the end of the line.

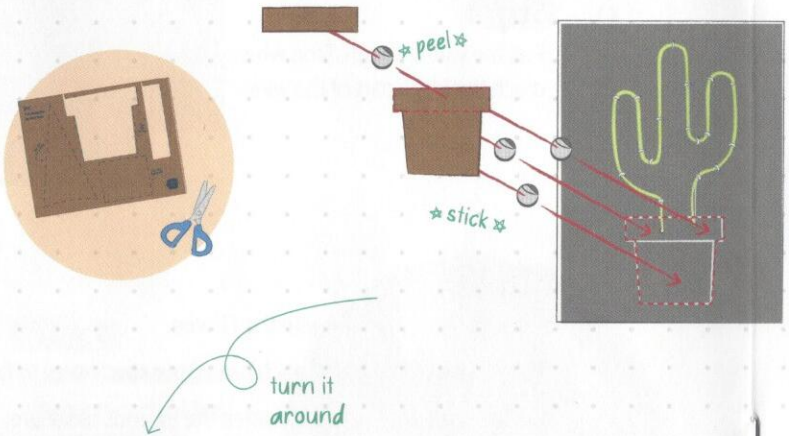
Push the end of the wire through the other large hole, then pull the rest of the wire through.



Step 7

The cactus, ice cream, and lightbulb have extra details!

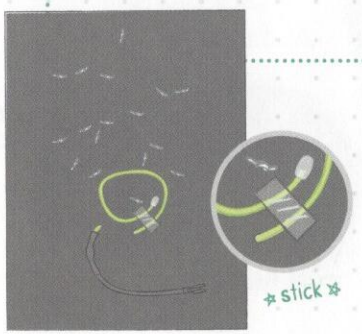
Cut out the **paper cutouts** that match those shapes. Use **sticky foam circles** to stick the cutouts to the template.



Step 8

On the back side of the template, replace the cap on the EL wire, then use one **clear sticker** to stick the wire down.

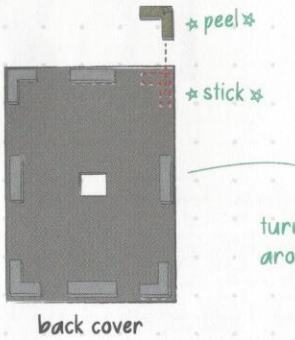
Make sure the wire doesn't overlap itself.



Step 9

Grab the **back cover** (there should be a square hole in the middle).

Line up **sticky foam** pieces with the dotted lines and stick them down.

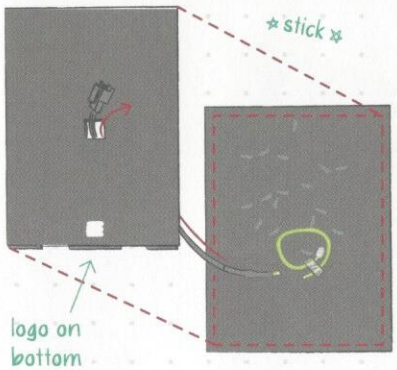


turn it around

Step 10

Flip the cover over. Poke the clip end of the EL wire through the hole.

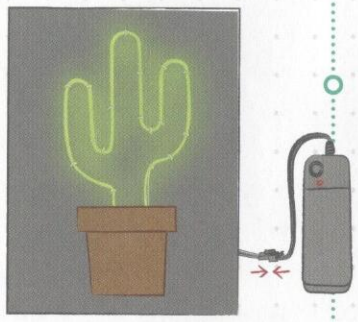
Line up the back cover with the back side of the template, then stick it down.



Step 11

Connect the EL wire to a battery pack wire.

Turn on the **battery pack** to light up your EL art!



You just wired up your EL wire.

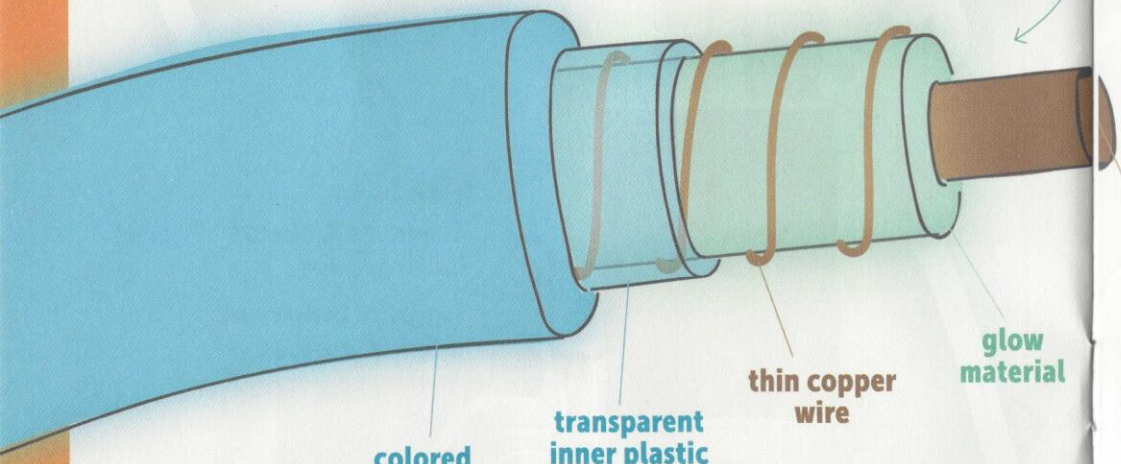
Turn the page to learn **how it works**!

Or skip to page 14 to **continue making**.

HOW DOES EL WIRE WORK?



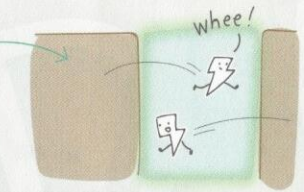
EL wire lights up because of electroluminescence. That's a fancy way of saying that it uses electricity to make light.





At the center, EL wire has a **thick copper wire** covered by a special **material that glows** when electricity runs through it. A **thin copper wire** spirals around that, putting the glow material in a copper sandwich. When the power turns on, electricity jumps between the copper wires and through the glow material, lighting it up. That's electroluminescence in action!

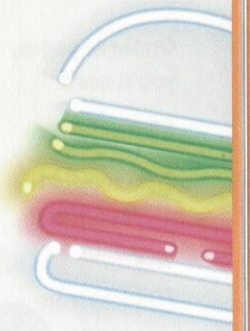




The electroluminescent core is pretty delicate, so it's surrounded by **two layers of protective plastic**. They're **transparent** *(to let the light out)* and flexible *(to let the wire bend)*. The outermost layer is also usually **colored** to make more glowing colors.

Because EL wire uses electroluminescence, it doesn't get hot like a light bulb. Light bulbs use electricity to heat up a wire until it glows. In EL wire, the glow material turns electricity directly into light! This phenomenon keeps EL wire cool to the touch *(and cool to the eyes)*!







Shutterstock.com / By NRTN

There are a couple **ways to show** your shining design.

Part C: **Display Your Art**

ON A STAND

OR

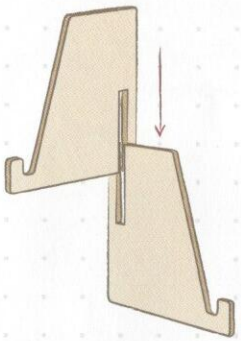
HANG IT UP

On these pages, you'll need:

- ☐ stand pieces
- ☐ completed design (from part B)
- ☐ sticky foam squares
- ☐ hang tab

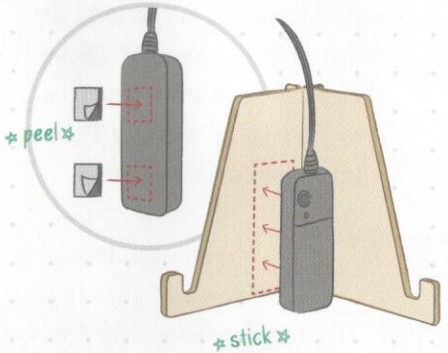
Step 1

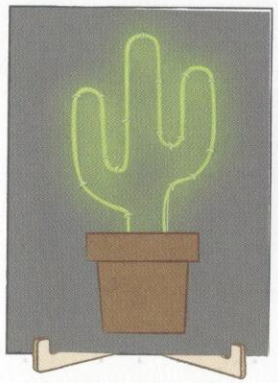
Slot the **stand pieces** together.



Step 2

Stick two **sticky foam squares** to the back of the **battery pack**. Stick the battery pack to the interior of the stand pieces.



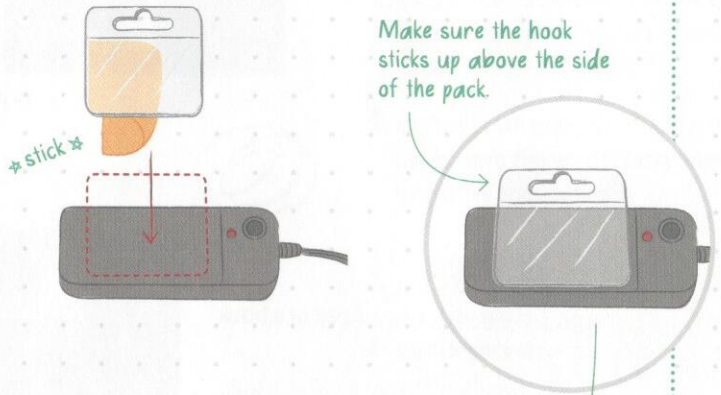


Step 3

Place your art on the stand and light it up!

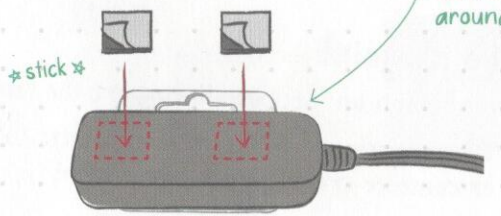
Step 1

Peel the backing off the **hang tab**, then stick the tab to the battery pack cover.



Step 2

Stick two **sticky foam squares** to the back of the battery pack.



Display Your Art (continued)

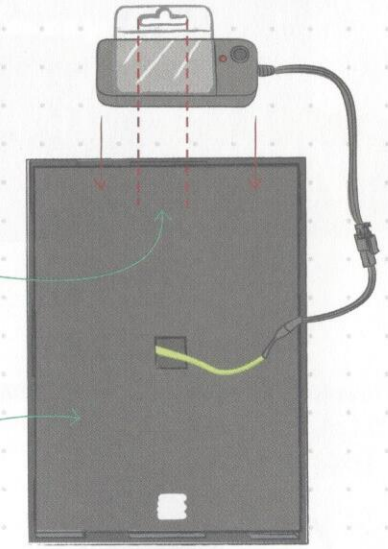
HANG IT UP

From home:

- ☐ hook or nail

Step 3

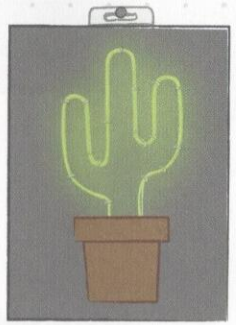
Flip your design over. Stick the battery pack to the top of the back side so the hang tab is centered.



Step 4

Hang your art on a nail or a hook and light it up!

If you want to put a nail in a wall, check with a grownup first.



Do it again!

Create another piece of glowing art the same way.

You can pick one of the other templates to follow, or consider creating your own design!

Want more? Try this out!

Part D: Design Your Own

On this page, you'll need:

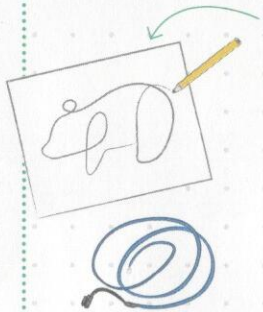
- ☐ blank sheet
- ☐ colored pencil
- ☐ EL wire

And from home:

- ☐ scratch paper
- ☐ pencil

Step 1

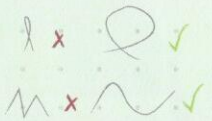
Create your design on scratch paper.



Follow these guidelines for a successful design:

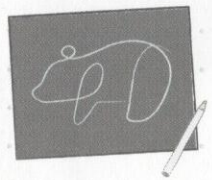
1. Make sure your design **fits on the sheet**.
2. Create your design using **one smooth, continuous line**. Your line should have a start and an end point.
3. Lay the EL wire over your sketch to **make sure the wire is long enough** to complete your design.

Tip! Avoid sharp corners and small curves. These shapes are hard to follow with the wire.



Step 2

When you're ready, draw the design on the included blank paper with the colored pencil.



Design Your Own (continued)

On these pages, you'll need:

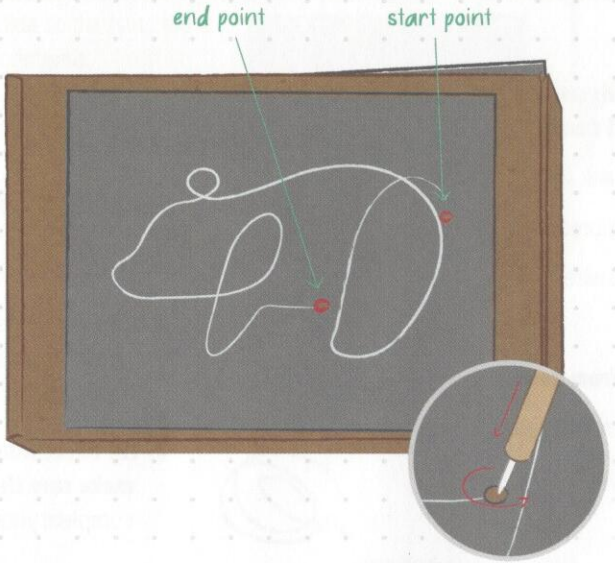
- ☐ Light-Up Wire Art box
- ☐ awl
- ☐ twist ties
- ☐ EL wire

And from home:

- ☐ scissors

Step 3

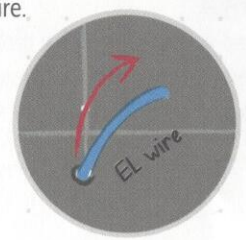
Use the **awl** to punch and widen a large hole at the start point. Do the same at the end point.



Step 4

Like before, remove the cap from the end of the **EL wire.** From the back of the template, press the wire through one of the large holes.

Pull it through until you reach the black part of the wire.

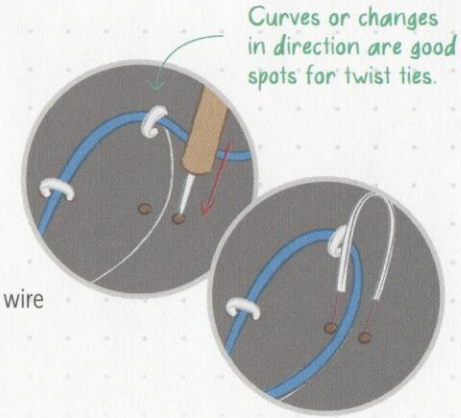


Step 5

From the start point, lay the EL wire over your design.

Use the **awl** to punch holes on both sides of the line.

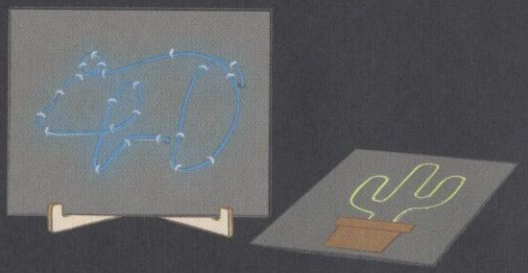
Poke a **twist tie** through to hold the wire in place and keep going.





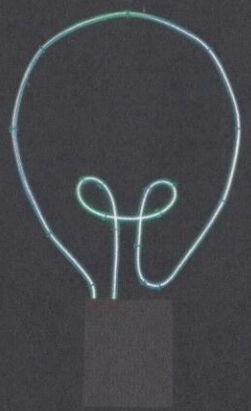
Step 6

Follow the instructions on page 8 to complete your custom-designed light-up artwork!



You're done!

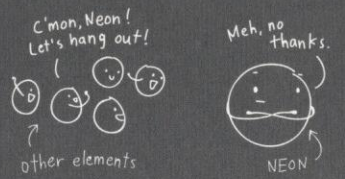
You made your own **light-up wire art!**



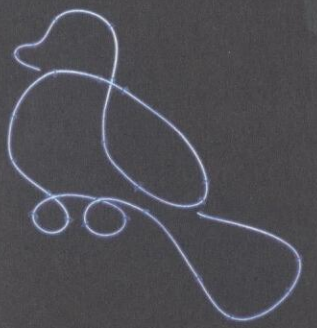


SO HOW DO NEON LIGHTS WORK?

Neon signs have a gas inside them called *(you guessed it)* neon. Neon is an element that belongs to a group called the noble gases. They're "noble" because they don't mix or react with other elements. However, they do react to getting **zapped with electricity**: that makes them glow!







Want more?

KiwiCo designs awesome hands-on projects for innovators of all ages.

Check out **KiwiCo.com**