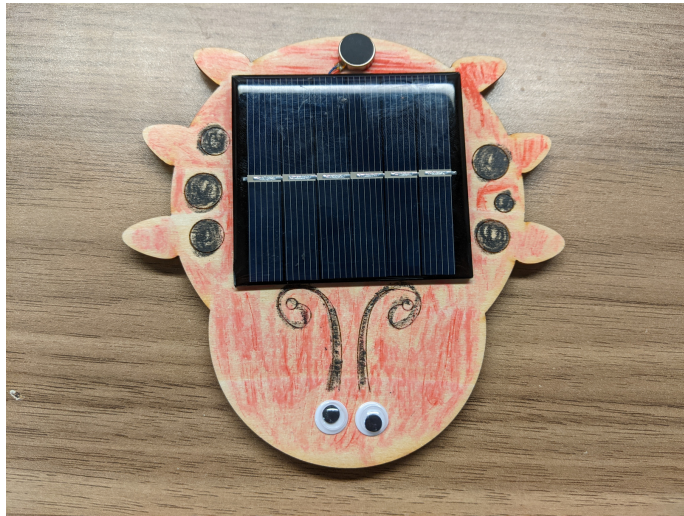


Do Space Summer 2021

TAKE & MAKE: SOLAR BUG



INTRODUCTION

Can we create a circuit without a battery to power something up? We can with the sun! We are exploring solar energy with this fun little bug that moves and grooves with the power of the sun.

WHAT YOU'LL NEED:

Here's what you'll find in the kit:

- 1 Bug Body
- 1 Mini Solar Panel
- 1 Vibrating Motor
- Nylon Conductive Tape
- Foam Tape Square
- 1 Crayon Pack
- 5 Googly Eyes

Other supplies you will need:

- Scissors
- Other decorating materials (optional)

Subjects:

- Circuitry
- Engineering
- Crafting
- Solar Energy

Standards:

- PS3.D
- ETS1.A
- ETS1.C

[nextgenscience.org](https://www.nextgenscience.org)

Maker Capacities:

- Tinker to Explore
- Finding Opportunities

[agencybydesign.org](https://www.agencybydesign.org)

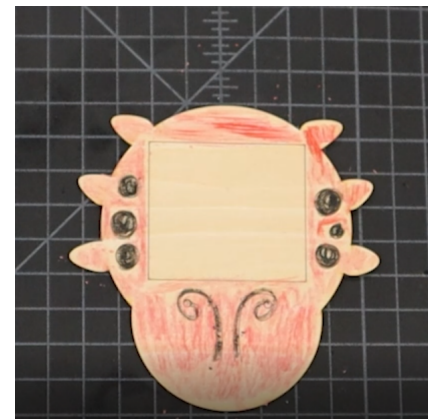
Key Terms

- Circuit
- Solar Energy
- Conductive
- Photovoltaic

Let's Make This!

Start by pulling out all of the pieces of the kit and

Put all of the supplies and equipment at right angles to each other. This is a technique known as **knolling**. Knolling lets you easily see if you're missing a piece.

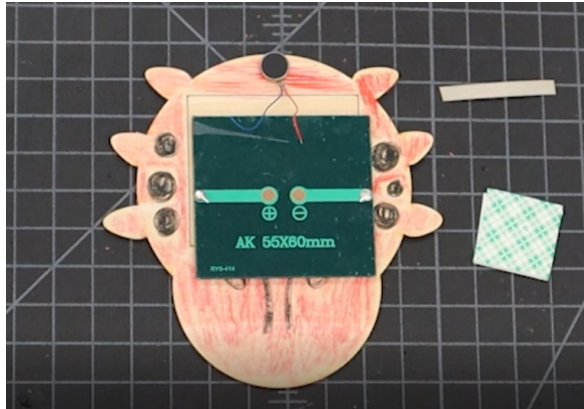


Solar panels work by allowing photons, or particles of light, to knock electrons free from atoms, generating a flow of electricity. Solar panels are comprised of many, smaller units called photovoltaic cells. Photovoltaic simply means they convert sunlight into electricity. Many cells linked together make up a solar panel, creating electricity.

Let's Make This!

Connect the vibrating motor to the solar panel

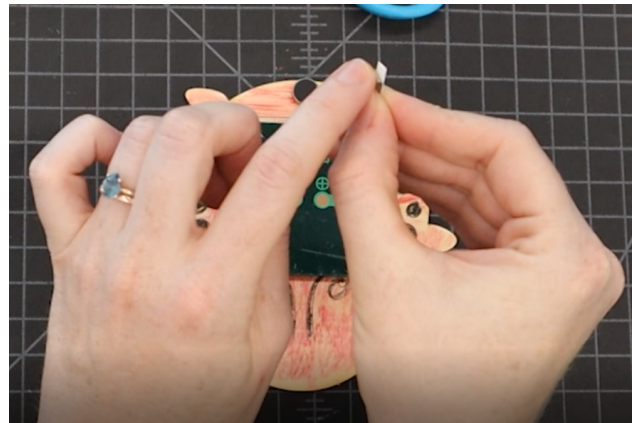
Take the plastic film off the front of your solar panel and discard. Turn it over and look for the two copper circles marked with positive (+) and negative (-). We will be connecting the wires of the vibrating motor to these copper circles. The red wire is positive (+) and the blue wire is negative (-).



They're Polarized!

Our solar panel and vibrating motor have polarity, or they have two poles: positive (+) and negative (-). In short, it is the directional flow of electrons from one pole to the other. We need to connect the positive to positive and negative to negative to make our circuit work.

Grab the nylon conductive tape and with the pad of your index finger, lightly brush down on the edge of the nylon side to separate it from the white paper backing, only going about half way. Cut off half of the nylon tape.



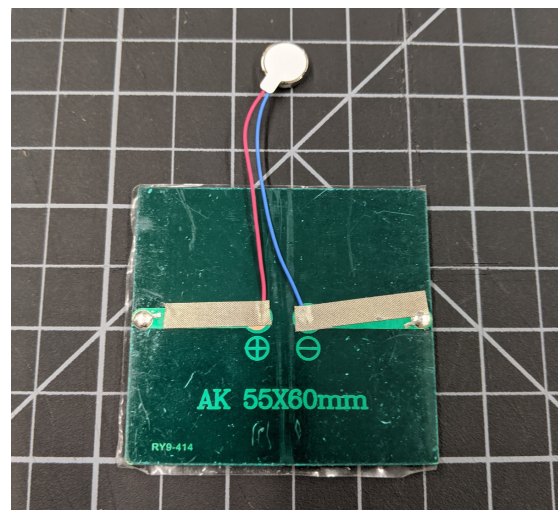
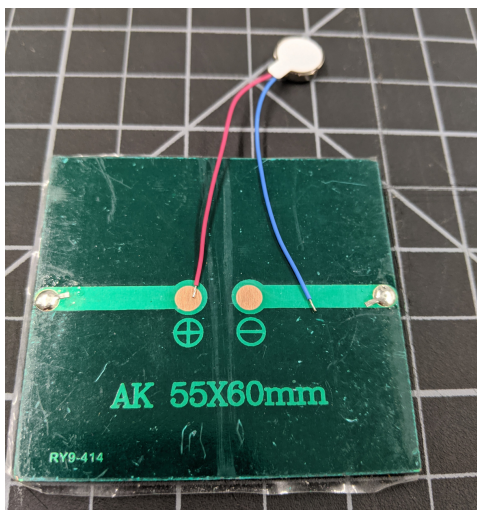
Share what you made! @DoSpaceOmaha #DoSpaceSummer



Let's Make This!

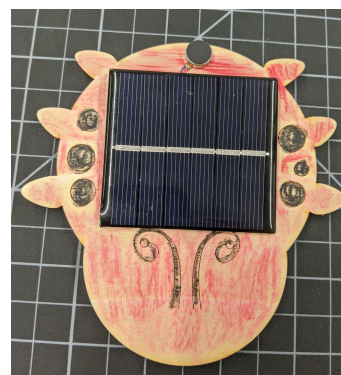
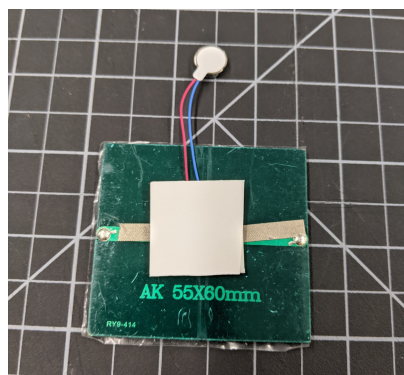
Take the red wire(+) of the vibrating motor and lay the exposed end of the wire onto the positive(+) copper circle of the solar panel. Place the nylon tape on top of the wire, making sure there is a good connection of the exposed wire on the copper circle. Make sure the tape does not touch the negative copper circle.

Using the other half of the nylon tape, take the blue wire(-) of the vibrating motor and lay the exposed end of the wire onto the negative(-) copper circle of the solar panel. Place the nylon tape on top of the wire, making sure there is a good connection of the exposed wire on the copper circle. Make sure the tape does not touch the other circle or piece of tape.



Attach solar panel and vibrating motor to bug body

Take the foam tape and peel one side of the paper off. Stick it to the solar panel over the the nylon tape. This will help keep your wire connections secure. Take the other side of the paper off the foam tape and turn over the solar panel. Press the panel on the rectangle on the bug body. Press for several seconds to make sure it is secure. Take the white backing off the vibrating motor and press it on the bug body too.



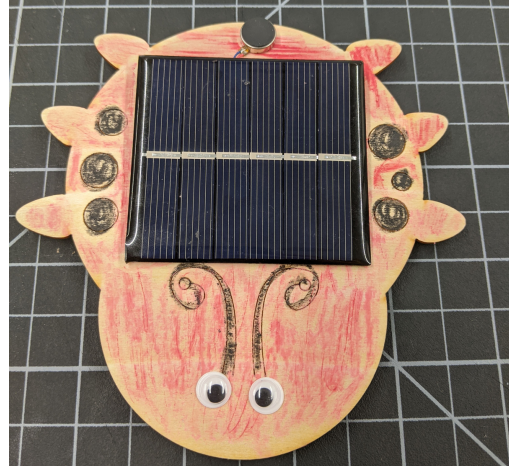
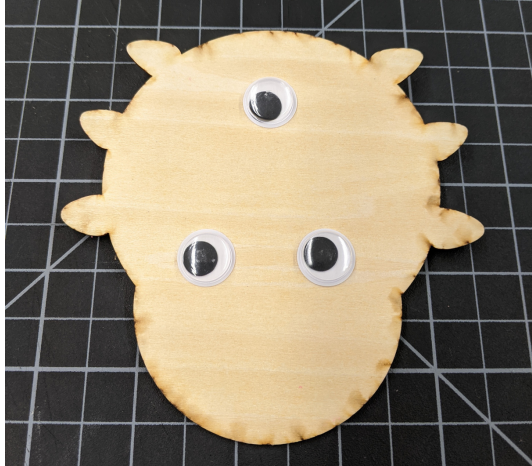
Share what you made! @DoSpaceOmaha #DoSpaceSummer



Let's Make This!

Add the googly eyes

Turn over your bug body. Take the three larger googly eyes and remove the paper backing. Stick them on the body in a triangle shape. Add the two smaller eyes on the front of the bug face near the antennae.



Test Your Circuit

Test your circuit by going outside on a sunny day. If it starts to vibrate, congratulations, you've made a circuit using solar energy! Place it on a flat, smooth surface and watch it shimmy and shake

Not vibrating when in the sunlight? Here are some things to check:

- Double check your red wire are connected to the positive copper circle and the blue wire connected to the negative copper circle and not switched around and not touching each other.
- Make sure the exposed wire at the ends are touching the copper circles and making a good connection.
- The amount of sunlight will affect how much the motor vibrates, it may not work on a cloudy day.



Share what you made! @DoSpaceOmaha #DoSpaceSummer

