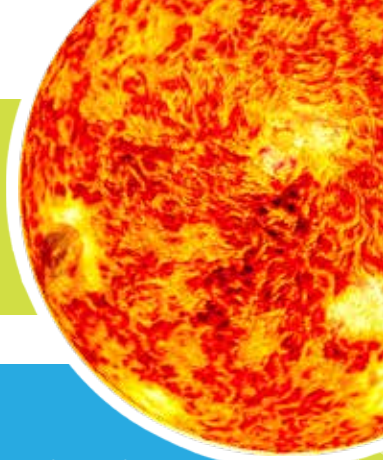
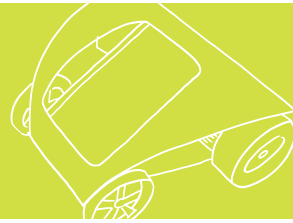


ACTIVITY 1

BASIC CONSTRUCTION



Innovation is all about making improvements. But, in order to improve, you need to start from something. In this activity, you'll build a basic solar vehicle.

DID YOU KNOW?

The Solar Car Challenge is a high school engineering competition where school teams design, build, and race full-size solar vehicles. Some years, the race is held on a closed track, and some years, it's a cross-country race that spans half the US.

Credit: SolarCarChallenge.org/challenge/about.shtml

LET'S MAKE



GATHER YOUR SUPPLIES

So we can, you know, do this thing!



SUNEZOOM CAR KIT

**NOT INCLUDED:
TRANSPARENT TAPE,
SCISSORS, HOBBY KNIFE, AND
SANDPAPER**

CAUTION: To assemble the solar vehicle, do not use the SunEzoon Car kit User Guide. Follow the instructions in this guide to make vehicle innovations easier in later activities.

STEP 1

Deburr the axles by brushing the ends against sandpaper. This will make it easier to push the axles into the wheels.

NOTE: If you don't have sandpaper available, you can rub the axles on a concrete sidewalk or driveway to deburr them.



STEP 2

Find the four axle bushings. Pick up the chassis plate and look at its side. Notice it is corrugated and there are holes along both long sides. Count two holes back from one end. Place one of the axle bushings in that hole. Do the same on the other side of the plate. The two axle bushings should be parallel. This is where the front axle will go.

STEP 3

From the other end, place an axle bushing in the third or fourth hole – you want the large rear tires to be close to even with the back of the chassis. Do the same on the other side. This is where the back axle will go.

STEP 4

From the gear font, detach Gear I (40 tooth, 1/8" bore). This is the driven gear. There might be some flashing, or burrs, on the gear, which will keep the gear from running smoothly. Using a hobby knife or sandpaper, carefully cut or sand off any flashing. Now, detach Gear G or N (20 tooth, 2 mm bore) from the gear font. This is the pinion gear. Cut off any flashing.

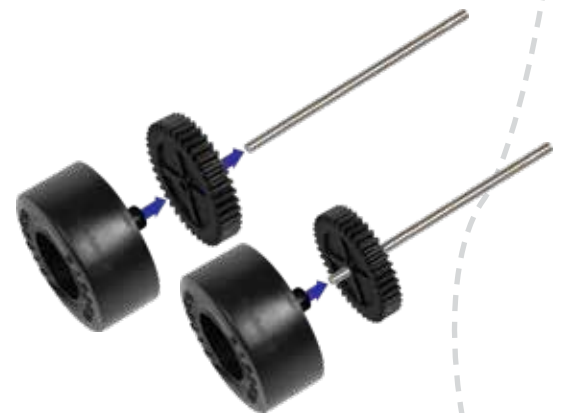
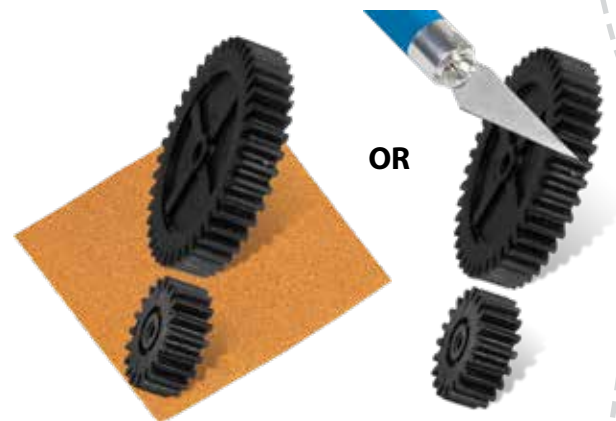
NOTE: If you don't have a hobby knife or sandpaper, you can use an open pair of scissors. Just be careful.

STEP 5

Press an axle into the drive gear. Push it through so approximately 1/4" of the axle is extended on the other side of the gear. Press one of the rear wheels on that 1/4" end.

STEP 6

Insert the axle into one of the back axle bushings. Push it until the end exits the axle bushing on the other side. Push the other rear wheel on the axle end. Make sure the parts are not too tight or the wheels and gear will not turn properly.



STEP 7

Push the other axle into one of the front wheels. Slide this axle through the front axle bushings. Push the other front wheel onto the free end of the axle. Again, make sure the parts are not too tight.



STEP 8

Push the pinion gear onto the motor shaft. Snap the motor into the motor mount.



STEP 9

Turn the motor so the pinion gear is on top of the drive gear and the motor is between the two rear wheels. Let the gears mesh together and the pinion gear roll forward until the motor mount rests on top of the chassis. The gears should be meshed but not too tightly. If they are too tight, the gears will not work properly. Mark where the front of the motor mount will attach to the chassis.



NOTE: At this time, do not pull the adhesive backing off the motor mount. You will use tape to hold the motor in place so that it is easier to modify the vehicle.

STEP 10

Get a piece of tape about two inches long. Fold one end of the tape over to create a non-sticky tab that is about a quarter of an inch long. Center the tape along the base of the motor mount. Use a second piece of tape on the other side of the motor mount.

NOTE: The folded tabs on the tape will make it easier to remove in later activities.



STEP 11

Without letting the tape touch the vehicle chassis, engage the gears and carefully roll the motor forward to the mark you made. Tape the motor to the chassis. Make sure that the tape does not interfere with the back wheels or the gears.



STEP 12

Clip the black and red wires from the solar panel to the motor connection terminals. You might need to turn the motor in the mount so the connection clips do not stick up and interfere with the solar panel placement.



STEP 13

Create a loop out of tape about as wide as the motor. Place the tape loop on the back of the solar panel near the wires. Flip the solar panel over and attach the tape loop to the top of the motor. The bottom of the solar panel should rest on the vehicle chassis.



STEP 14

This is as far as we'll go for now. Take your completed solar car outside on a clear, bright day and place it on a smooth, level surface. If properly connected, it will take off. If it runs backward, switch the red and black wires on the motor connection terminals.



THINK ABOUT IT



ASK THE QUESTION

Because understanding the why is important.

Are there ways to make assembling the solar vehicle easier?

What factors do you think will affect the performance of the solar vehicle?

How does this model solar vehicle relate or compare to vehicles needed to transport people?