

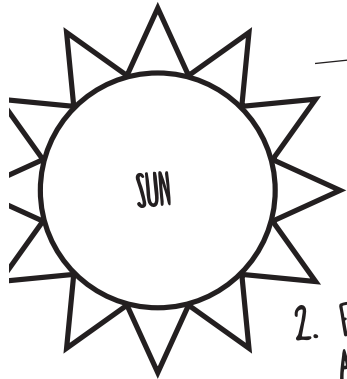
HELP BARBIE FIND THE CONSTELLATION!



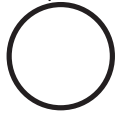
Connect the dots to complete the constellation.

Barbie
YOU CAN BE ANYTHING

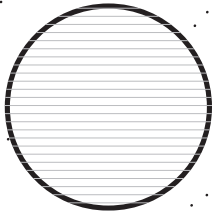
CAN YOU NAME EACH PLANET?



1. THE CLOSEST PLANET TO THE SUN



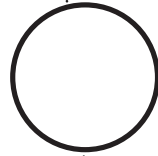
2. EARTH'S TWIN PLANET THEY ARE ALMOST THE SAME SIZE!



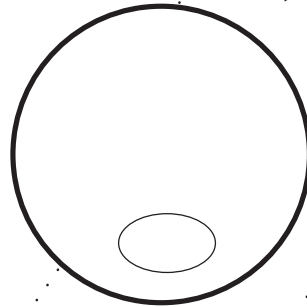
3. THE PLACE WE CALL "HOME"



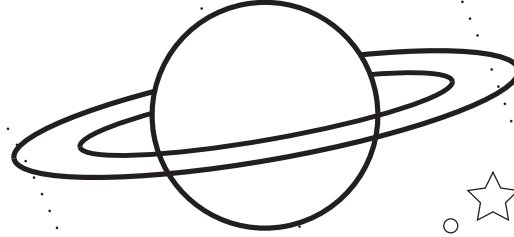
4. NICKNAMED THE "RED" PLANET



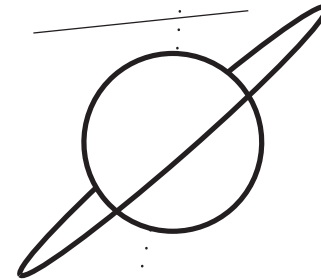
5. THE BIGGEST PLANET



6. HAS RINGS AROUND THE PLANET



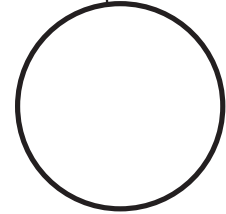
7. THE PLANET THAT SPINS ON ITS SIDE



9. A SMALLEST PLANET



8. HAS THE STRONGEST WINDS OF ANY PLANET



Barbie 1st became an Astronaut in 1965!



Barbie

YOU CAN BE ANYTHING



Barbie
**SPACE
DISCOVERY**

**BUILD YOUR OWN
SPACE ROVER**

YOU CAN BE ANYTHING



ROVING ON MARS

Have you ever wondered what life is like on Mars? We have! Scientists use Rovers to explore the surface of Mars, gather data and carry supplies.

WE CHALLENGE YOU TO BUILD A RUBBER BAND-POWERED ROVER!

MATERIALS:

- Corrugated cardboard (6-inch square) has grooves in middle
- 2-Pieces Corrugated cardboard wheels (5-inch squares or circles)
- 1-Round pencil sharpened
- 2-Round Wheels (can use toy car or lifesavers)
- 1-Plastic drinking straw (if use lifesavers)
- 2-Rubber Bands
- Scissors
- Ruler
- Tape



Sources: NASA <https://www.jpl.nasa.gov/edu/learn/project/make-a-cardboard-rover/>
<https://pbskids.org/designsquad/build/roving-moon/>



INSTRUCTIONS TO BUILD

STEP 1: Design & Build the Rover Body. Fold the cardboard into equal thirds along the corrugations (the grooves inside of the cardboard), pushing up the sides until your body has 3-sides. Each side will be about 2" across.

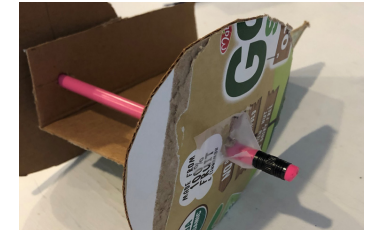
STEP 2: Use a pencil to carefully poke a hole near the top of each of the two outermost sections on the rover body. Make sure the holes are directly across from each other and are big enough for the pencil to spin freely. This is where your axel will go.

STEP 3: Build the Rear Wheels. On the two 5-inch cardboard pieces, draw diagonal lines from each corner forming an "X". Poke a small hole in the center with a pencil where the lines cross.

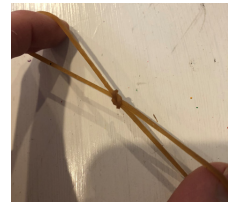
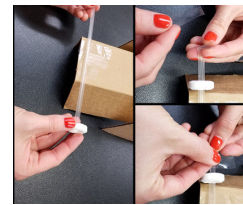


STEP 4: Slide the pencil through the axle holes. Slide the cardboard wheels onto each end of the pencil and secure with tape.

STEP 5: Make the Front Axle and Wheels. Tape Toy Car to the front of your rover body.



ALTERNATE OPTION: Tape the straw across the bottom of the rover body on the opposite side of the pencil. Slip a candy onto each end of the straw. Bend and tape the ends of the axle to stop the candies from coming off.



STEP 6: Build Power Source- Rubber Band Chain. Create a chain with the two rubber bands as shown above. (different lengths & widths of rubber bands will wind up and release differently)

STEP 7: Attach the Power Source. Loop one end of the rubber band chain around the pencil. Cut small slits into the front of the rover body. Slide the free end of the rubber band chain into the slits.





TEST YOUR ROVER

TEST: Hold the body tight and rotate the wheels to wind up the rubber band then put on the floor.

OBSERVE: What did the rover do? How far did it travel? (rotate the wheels in different directions to make rover move forward or backwards)

IMPROVE: Think about adjustments you can make to improve performance.

- Did the wheels turn freely? Check that the pencil turns freely in the holes and that wheels are firmly attached and are parallel to the sides.
- Did the rover travel in a straight line? Make sure the pencil is straight and the front wheels are the same size.
- Did the rover only travel a short distance? Wind up the wheels some more. Larger wheels might make it travel further. Also try different shapes.

Sources: NASA <https://www.jpl.nasa.gov/edu/learn/project/make-a-cardboard-rover/>
<https://pbskids.org/designsquad/build/roving-moon/>

