

**Mini Moon Rover**

**Activity #3**

**6-8**

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# **Materials**

* Carboard
* Pencil
* Straw
* Rubber Bands
* Ruler ***(not provided)***
* Tape ***(not provided)***
* Round Mints with Center Hole ***(not provided)***
* Scissors ***(not provided)***

# **Construction Specifications**

1. To contruct the rover, start with the body. Take the large cardboard square (6”) and fold it into thirds, folding with the corrugation in the cardboard. The corrugations are the tubes in between the outer layers of the cardboard and folding with them will be much easier than folding against them. Each segment should be about 2” wide.
2. To make the front wheels, draw an X on each large piece of cardboard (5”) and poke a hole where they cross, using the sharp pencil. On the body, poke holes near the front on the sidewalls, as shown in the diagram. This will be where the front axle will pass through. Be sure that the holes line up and are directly across from each other, otherwise the axle will be crooked.
3. Once that’s completed, slide the pencil through the body and attach the square wheels. Be sure to tape up where the pencil contacts the wheels so that the wheels and axle move as one.
4. For the rear wheels, simple tape the straw to the bottom of the body, close to the opposite end of where you placed the front wheels. Slide the candies onto the axle, and then fold and tape the ends of the straws so that the rear wheels cannot fall off.
5. Lastly, cut slits into the rear end of the body. Loop one rubber band around the front axle, then loop the free end of that rubber band into another so that they become a chain. Loop the free end of the chain into the slips cut into the rear of the body.





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# **The Engineering Process:**

A large part of the engineering process is designing, testing, and redesigning. The most effective way to see the limitations and problems with a design are to test it! Once its been tested, what was learned and how can the design be improved? Were there any issues you have with your rover? How would you go about fixing them? Some examples of problems and questions that may come out of testing are:

* The wheels are not turning freely. Maybe the holes for the front axle need to be widened?
* The wheels spin too quickly, and the rover barely moves. Maybe some weight could be added to the wheels so the wheels “dig into” the ground a bit more?
* The rover always curves right or left when it moves forward. Check the alignment of the front axle, maybe its not as straight as you meant it to be. Is there anything else that might cause this?

After addressing what was learned by testing and understanding the results, how could the rover be improved? What fixes and changes would you implement?