

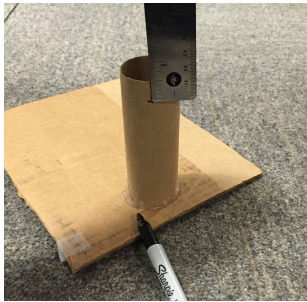
Simple Machines: Jump Rope!

Supplies Needed:

1 Cardboard base
Hole puncher
1 Blue wire
1 Straw
Paper
Glue
Paperclips

Steps:

1. Using a ruler, measure $\frac{1}{2}$ inch down from the top of the tube, on the side marked with a star. Mark the spot

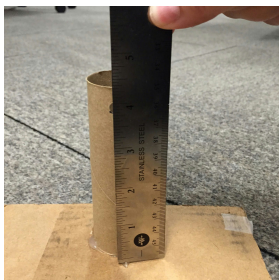


2. Punch a hole over the marked spot.



3. On the side of the tube marked with a triangle, measure $\frac{1}{2}$ inch down from the top of the tube. Mark the spot.

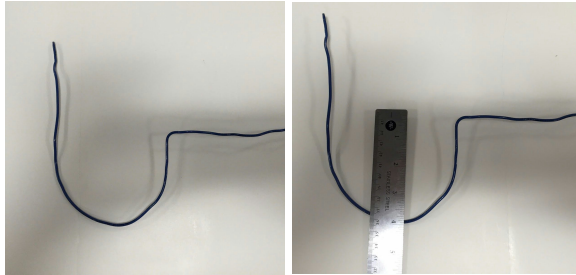
4. Using the ruler, measure the length of the space from the bottom of the cardboard base to the bottom of one of the holes just made. Note the length here: _____



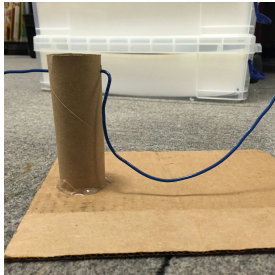
5. Take the blue wire and bend the last approximate 1/3 into a sharp right angle.



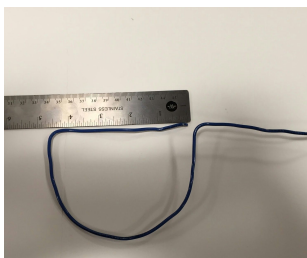
6. Using the longer half of the bent wire, bend a curve into the wire. The depth of the curve should be almost, but not quite, as long as the length noted in step #4.



7. Thread the uncurved end of the wire through the two holes in the tube.
8. Try turning the uncurved end of the wire. Does the curved end circle around? If it hits the cardboard base, adjust the depth of the curve. The curve should come close to the bottom of the base, but not touch it.



9. Remove the wire from the holes.
10. Once the curve is complete, bend another sharp right angle into the wire, at the end of the curve. The angle of the bent wire should be towards the first bend, creating a straight line with the remaining length of wire between the two. The curve should now look like the letter D.
11. Using the ruler, measure the length between the two right angles. Note it here:



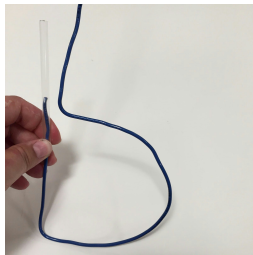
12. Take the straw and measure it to be $\frac{1}{2}$ inch shorter than the length measured in step #11. Mark it.



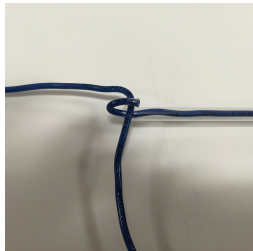
13. Cut the straw at the mark just made.



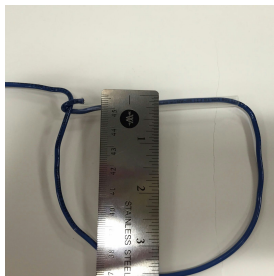
14. Slide the cut piece of straw onto the remaining straight line of wire leftover from the second right angle made, the straight line of the letter D.



15. Wrap the tail end of the wire (the straight line of the letter D) around the first right angle, to anchor the D shape.



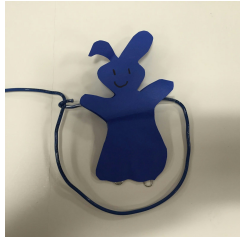
16. Using a ruler, measure the curve of the D, from the deepest part of the D to the straight back. Record the length here: _____



17. Now, times the length recorded in step #16 by 2, Record the answer here: _____

18. Using paper, scissors, marker and glue, make a figure to jump the wire rope. The figure should be no longer than the length recorded in step #17. Be sure to make two sides to the figure; this can be done by folding a sheet of paper in half, and then cutting out the figure.

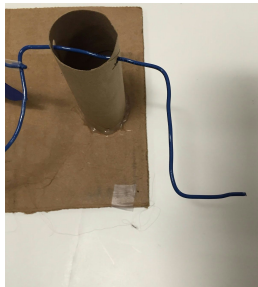
19. Take the two sides of the figure and line them up on the straw. Does it look like any part of the figure will hit the wire? If so, trim the figure. If it looks like the figure will clear the wire, glue both sides onto the straw.



20. Add paper clips to the bottom of the figure. The paper clips add weight to the figure, so it will stay in place while the wire turns.



21. Thread the uncurved end of the wire through the two holes in the tube.
22. Try turning the straight end of the wire. Does the figure stay in place when the wire is turned? If the figure turns with the wire, try adding more paper clips to the bottom.
23. Take the straight length of wire, and bend it into the shape of a crank handle, looking like an L made with two right angles.



24. Turn the handle and watch the figure jump rope! Have fun!

