Spinning Lamp v. 2

Supplies:

- ☐ corrugated cardboard
- ☐ vellum or white tissue paper
- ☐ mini craft sticks
- ☐ 3/16" wooden dowel
- ☐ 1.5" inner diameter PVC
- ☐ lamp socket
- ☐ lamp cord
- ☐ fluorescent bulb
- ☐ 25-30 RPM 6V motor
- ☐ hookup wire
- ☐ switch
- ☐ four AA batteries
- ☐ AA battery holder
- ☐ pencil
- ☐ craft knife
- ☐ scissors
- ☐ hot glue gun and glue
- ☐ protractor
- ☐ compass
- ☐ ruler
- ☐ hack saw
- ☐ phillips screwdriver
- ☐ drill
- ☐ 1.5" hole saw bit
- ☐ 15/64" bit
- ☐ sandpaper
- ☐ soldering iron + solder
- ☐ wire strippers
- ☐ 10" x 11" plywood
- ☐ two 1" W x 3" L x 1/2" D pieces of plywood
- ☐ two 1" W x 2" L x 1/2" D pieces of plywood
- ☐ four 1" W x 10" L x 1/2" D pieces of plywood
- ☐ one 3" x 3" piece of bass wood

Optional:

- ☐ wood scrap
- ☐ cardstock
- ☐ paint
- ☐ misc. decorations

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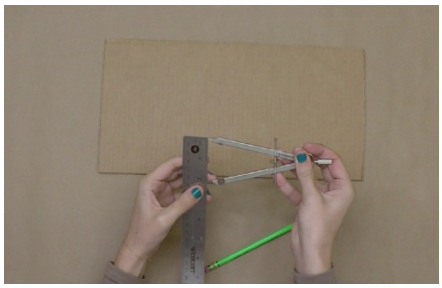
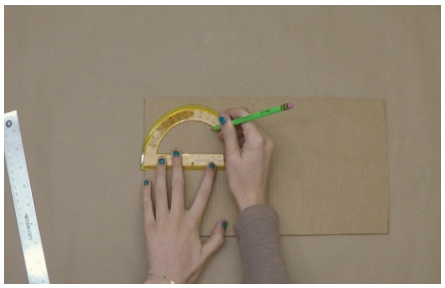
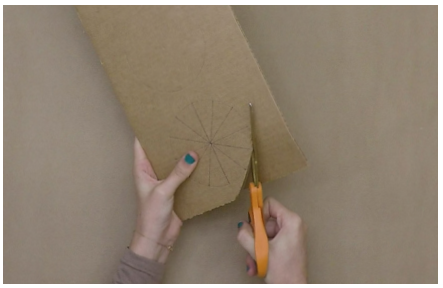


1. Use the compass to draw 2 four-inch diameter circles onto the cardboard.

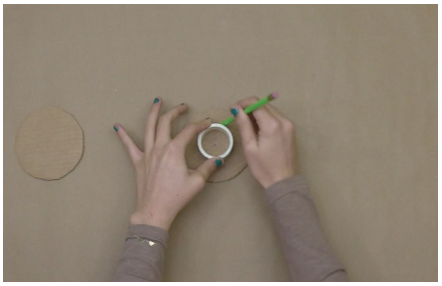


2. Use the protractor to divide one of the circles into twelve equal pieces.



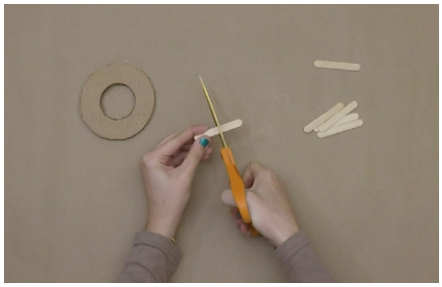
3. Cut both circles out.

4. Measure and mark one inch of PVC pipe. Cut it off with the hack saw. Sand the sawed edges down.

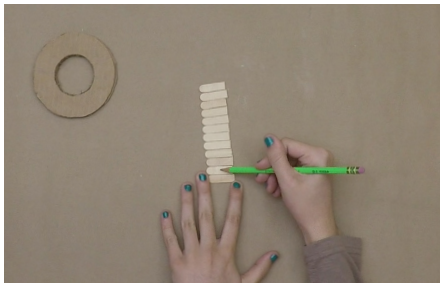


5. Center the PVC over one of the discs and trace its outer edge. Cut out what you traced. Repeat this step with the other cardboard disc.

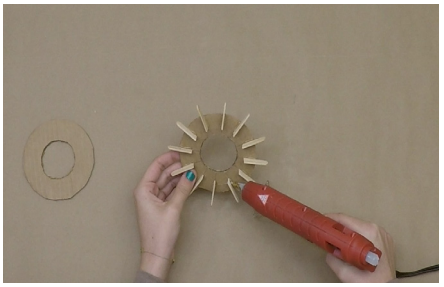
6. Make sure both discs fit snugly over the PVC.



7. Measure and cut six mini craft sticks in half.



8. Measure and mark the midpoint of the sticks that you cut in step 7, but do not cut them this time.



9. Glue the sticks upright along the 12 dividing lines so that half of each stick goes past the edge of the disc.

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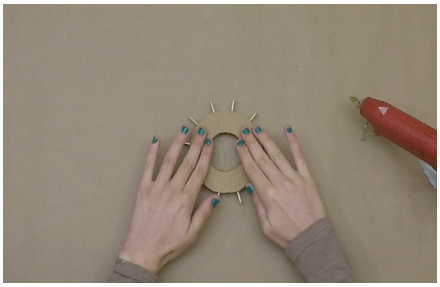
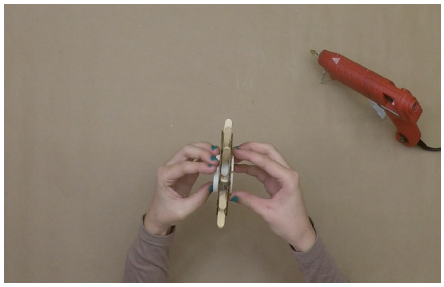
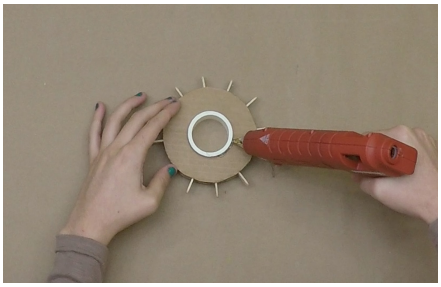


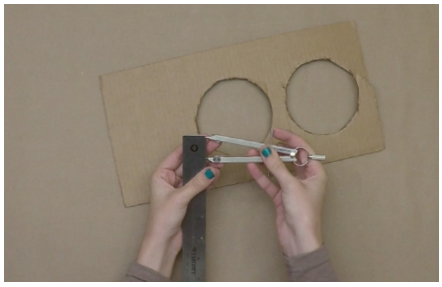
10. Now apply glue to the top edges of the sticks and glue the other cardboard disc on top.



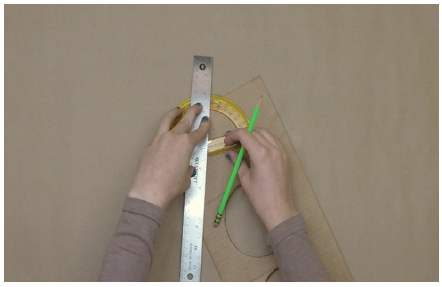
11. Push the PVC through the center and make sure that your gear is as level as possible.



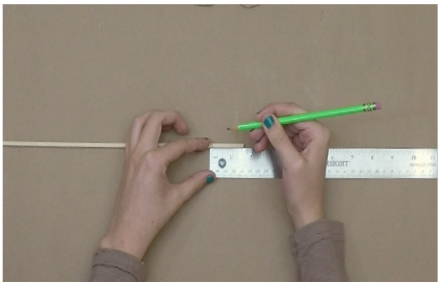
12. Once it is level, glue the PVC pipe in place. The PVC will help reduce friction as this gear spins over the lamp socket.



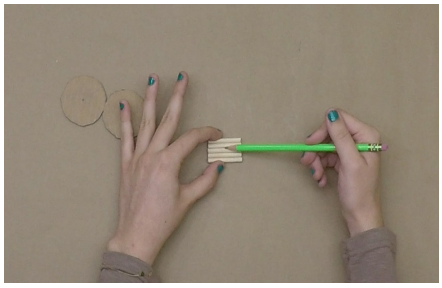
13. Use the compass to draw 2 two-inch diameter circles onto the remaining cardboard.



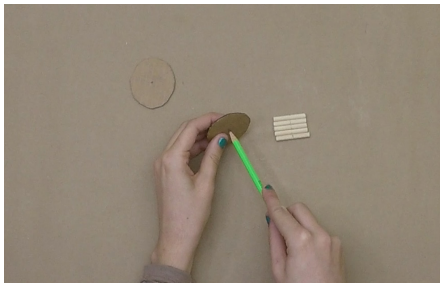
14. Use the protractor to divide one of the circles into fifths.



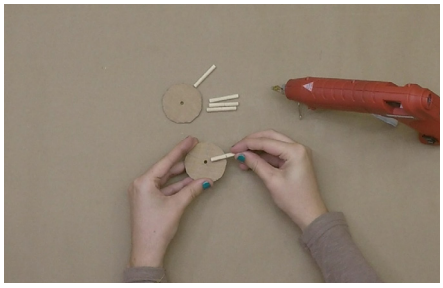
15. Measure and cut five 1.5" long pieces from the wooden dowel. Sand the edges down.



16. Mark the halfway point on each of the five pieces.



17. Use your pencil to poke a small hole into the center of each small cardboard disc. You will eventually attach the motor shaft here, so don't make the holes too big!



18. Glue each dowel piece to the 5 dividing lines so that half of each dowel extends beyond the edge of the disk.

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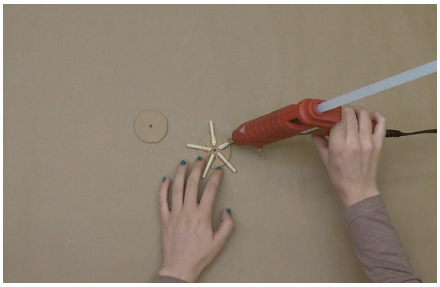
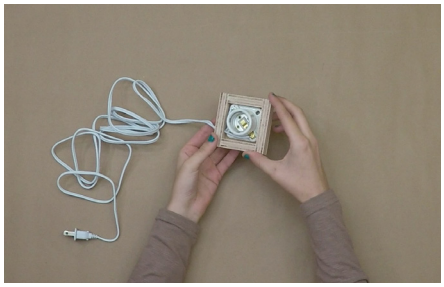
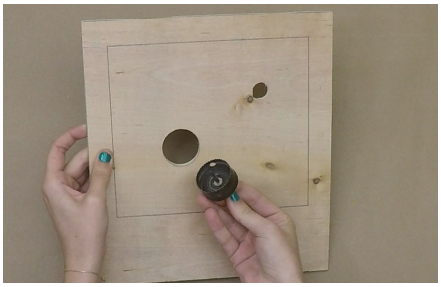


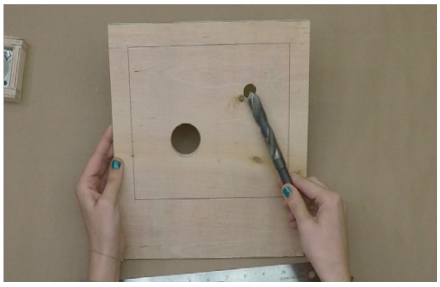
19. Apply glue to the top of each dowel and press the other cardboard disc on top.



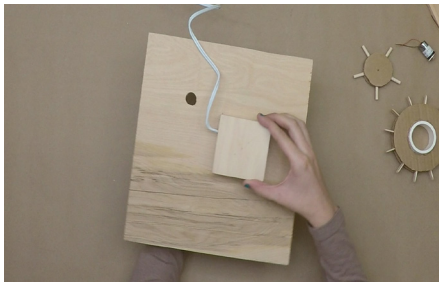
20. Please refer to the PDF from week 9 of the Fall 2015 Maker Camp After School Program to see how to make this lamp base.



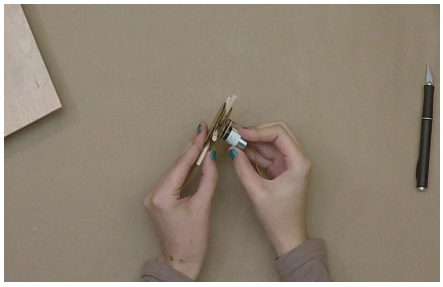
21. Find a piece of plywood large enough to hold the lamp that you want to design. Ours is 10" x 11". Drill a hole large enough for the lamp socket to fit through.



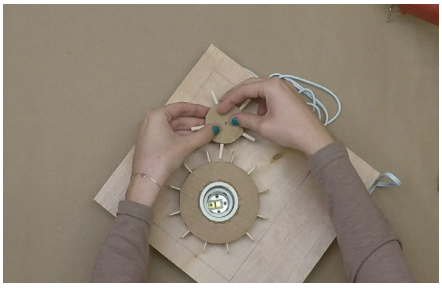
22. Drill another hole that is large enough for your motor. Before you drill this second hole, arrange your gears on the board to see where the hole placements should be.



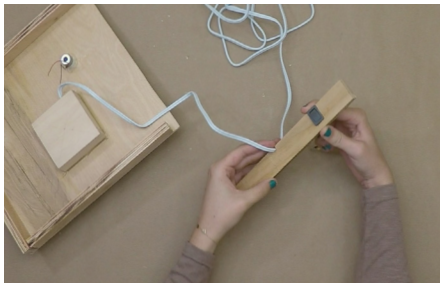
23. Glue the lamp base to the bottom of the plywood so that the lamp socket pokes out through the other side. Your larger gear will spin on this.



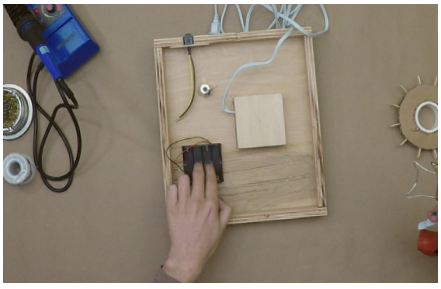
24. Glue the smaller gear to the shaft on your motor. Make sure it is not glued to the base of the motor and that it is parallel to the ground when the motor is upright!



25. Mount your smaller gear so that the dowels will hit the craft sticks directly in the middle of each stick. Glue the motor in place once you have found the correct height it should be at.



26. Glue wall supports to your plywood that are the same height as the base you made in step 20. We made two notches in one of our walls: one for the lamp cord and one for the switch.



27. Glue the battery holder to the bottom so that it is near the switch and motor.

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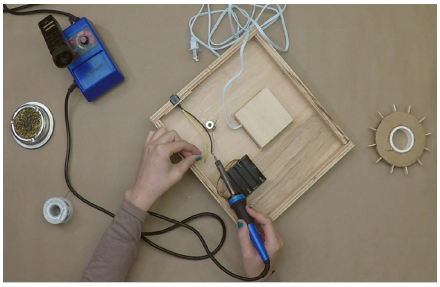
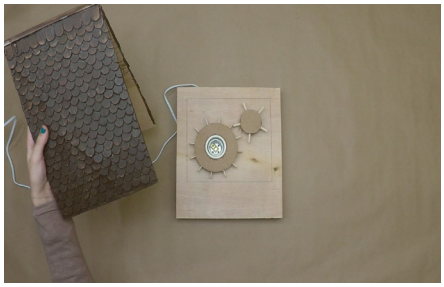
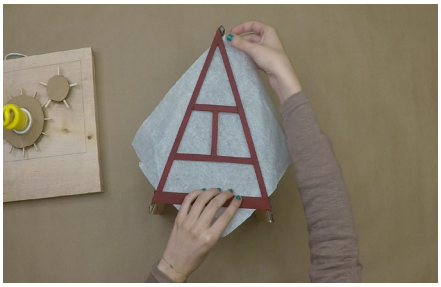


28. Solder your circuit. The switch should connect the red wire on the battery holder to the red wire on the motor. The remaining black wires should be soldered together.

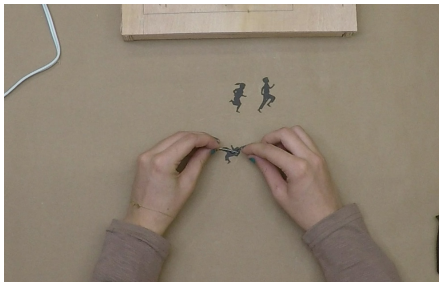


29. This part is where you can really let your creativity flow! What design do you want to make to go over your bulb? We made a cozy, A-frame cabin.

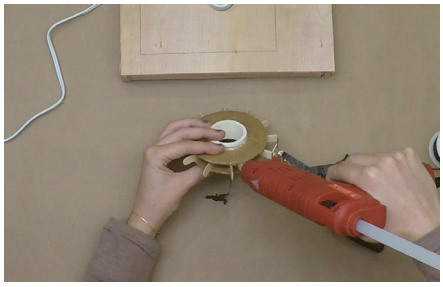


30. Use tissue paper or vellum to give your spinning designs a surface to project onto.

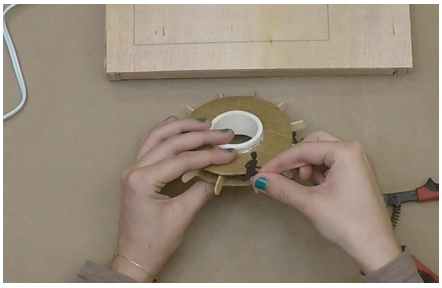
31. What will you have spinning on your gears? We cut out paper children to run through the cabinv. Make sure your design is on a thick piece of paper like cardstock.



32. To attach your design, cut and strip some hookup wire and bend it at a right angle. Glue one side of the angle to your cutout.



33. Next apply hot glue to the corrugated space on your large gear and wedge the other side of your hookup wire angle in between the layers of corrugation.



34. Make sure your design is above or on top of the craft sticks, not suspended between two sticks. You can bend the wire into the desired placement that you want.

35. Add more designs to your gear. How many can you make? Your lamp is almost ready to go! Just finish building whichever enclosure you want to place over the bulb.

36. Once your enclosure is ready, lower it over the gears and finish decorating the outside of your lamp. Happy making!