



## TOOLS:

### Build a Rope Machine



**Time Required:** 2 hours

#### Materials:

- Plywood (upright)  
1 piece 4-inch width x 4-inch length x  $\frac{1}{2}$ -inch thick
- Plywood (base)  
1 piece 4-inch width x 6-inch length x  $\frac{1}{2}$ -inch thick
- Plywood (paddle)  
1 piece 3-inch width x 9-inch length x  $\frac{1}{2}$ -inch thick.
- Plywood (separator)  
1 piece 3-inch width x 9-inch length x  $\frac{1}{2}$ -inch thick
- Plywood (holding device)  
1 piece 1-inch width x 9-inch length x  $\frac{1}{2}$ -inch thick.
- No. 9 wire (or coat hangers), 3 pieces of 6-inch length
- 3 wood screws
- 1 long screw eye
- 2 nuts/washers for screw eye
- Clamps
- Drill and bits
- Wire cutters or pliers
- Saw
- Screwdriver
- Safety glasses
- Sandpaper
- Wood glue

#### Terminology:

- **Crank** - wire hooks on the rope machine that twist the rope strands.
- **Holding Device** – a strong object that holds the strands together while they are twisted.
- **Paddle** – wooden piece that attaches to the cranks, turning all cranks with one motion.
- **Separator** – a notched device that separates the strands as they twist. Also called wrench.

#### Notes:

#### Instructions:

1. Sand all wooden parts smoothing corners.



2. At one end of the upright board, mark with a pencil the position for three screws —  $\frac{1}{2}$ -inch from the end,  $\frac{3}{4}$ -inch from the sides, and  $1\frac{1}{4}$ -inch apart.



3. Place the base in a clamp and apply glue to one end.



4. Press the upright to the glue-covered end of base and secure with wood screws.



5. Mark and drill three small holes in the upright for the wire hooks. Place the first hole in the center of the upright, 2 inches from the sides and the ends. Place the second and third holes 1-inch from the bottom and 1-inch from each side. The three holes form a triangle.



- You may vary the dimensions of the rope machine to accommodate materials you have on hand. In general, larger machines are needed for heavier rope.
- This rope machine is for making 3-strand rope. If you want to make 4-strand rope, you need to provide 4 hooks and make 4 notches on the separator.
- You can substitute large sturdy forks for the separator.
- Plywood is available in 4 ft. x 8 ft. sheets. Home supply stores often carry “half” sheets (4 ft. x 4 ft.) or smaller, and some will custom cut pieces for a nominal fee. Craft stores also may have small pieces.

### Rope Machine Challenge!

After using this rope-machine, some folks suggested ways to improve it. We encourage you to think of possible improvements, and even to build your version of a *new and improved* rope machine. Compare it to ours and see which works better. Try using different materials — can you build a rope machine from things you recycle? What makes the best holding device or the best separator? Test your ideas and let us know!

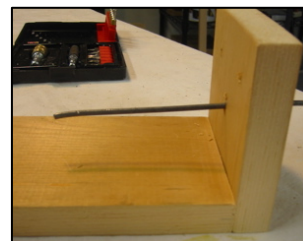
### Rope Machine Sources

Rope machines are available for purchase at these websites:

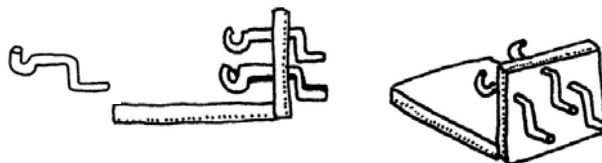
- Lehman's <[www.lehmans.com](http://www.lehmans.com)>
- Make Rope <[www.makerope.com](http://www.makerope.com)>
- Schacht Spindle Co., Inc. <[www.schachtspindle.com/hw\\_rope\\_machine.htm](http://www.schachtspindle.com/hw_rope_machine.htm)>
- The Toymaker's Workshop <[www.toymakersworkshop.com/inventions.html](http://www.toymakersworkshop.com/inventions.html)> (battery-powered Crazy Cords)

### Rope Machine Instructions (continued)

6. Insert the lengths of wire into the holes on the upright.



7. On the “inside,” shape a hook of approximately 0.5-inch diameter. On the “outside,” bend the wire to form a crank with two kinks.



8. Shape one end of the paddle as a handle by shaving approximately 3/4-inch of wood from each side for a length of 5 inches.
9. Drill three small holes in the paddle, duplicating the triangular pattern on the upright.



10. Cut three notches 1-inch wide and 1-inch deep into one end of the separator (one notch in the end and two on the sides). This separator is for making 3-strand rope.



11. Optional: A swivel holding device.

Mark the center on a piece of wood, approximately 1-inch width x 9-inch length x 1/2-inch thick. Drill a hole at the mark penetrating the wood.



12. Place a nut and washer on a long screw eye and insert the screw eye into the hole in the wood. Secure with a second nut and washer. The screw eye should rotate freely.

