

## What You Will Need

- 4 Leg Spars
- 2 Leg Supports
- 2 Roller Supports
- 3 Connectors
- 1 Roller Spar
- 1 Smooth Plank
- 12 Lashing Ropes
- 4 Lashing Ropes for the Roller Supports
- 1 Lashing Rope for the Plank
- 4 Guylines
- 2 Old Tyres
- 8 Pioneering Stakes or Tent Pegs

## Before You Begin

- Try to scale the project with those building it. Nothing should be too heavy for one person to lift and use safely.
- Make sure everyone has sturdy shoes on and that the ground you're building your seesaw on is steady, level and presents no other hazards.
- In building the seesaw, the premise is to space the A-frames, the roller supports and the two bottom connectors so that the roller spar can easily roll around, but can hardly move from side to side or up and down.

## Ready Set Seesaw

### Build the A-frames

1. Start by making two matching A-frames using the leg spars and leg support spars. You can use a shear lashing or a square lashing on top, and square lashings for the leg support spars.

The main thing is to make sure that with both A-frames, the tops intersect at the same distance from the tips and the legs spread apart an equal distance at the bottom ends.

### Prepare to connect the A-frames

2. Stand the A-frames up so that the legs and support spars are parallel, about four and a half inches apart.



Since the roller spar will eventually be rotating between the A-frames, the actual distance the A-frames are apart is determined by the diameter of the roller spar. Four Scouts should hold the A-frames upright and steady.

### Lash on the roller support spars

3. Measure about 30 inches up from the bottom ends of all four legs.

The height of the roller support spars will determine the angle of the board. Too steep an angle could easily make riding precarious.

4. Begin connecting the two A-frames by lashing on the roller supports with tight square lashings.

Lash them to the outside of the legs at a distance just a fraction wider than the diameter of the roller spar.

### Lash on the lower connectors

5. With the A-frames held steadily upright, temporarily lay the roller spar on top of the supports.
6. Using the diameter of the roller spar as a measure, continue to connect the two A-frames by lashing on two connectors at a distance just above the roller spar, with tight square lashings.
7. Remove the roller and set it aside

### Lash on the top connectors

8. Lash the last connector to one of the legs at the top of each A-frame, just below where the legs cross, with tight square lashings.

If there is difficulty reaching the point on the legs where this connector needs to be lashed, carefully lay both parallel A-frames on their sides and then lash the connector in place.

### Make the Anchors

9. Build four anchors out from each leg.

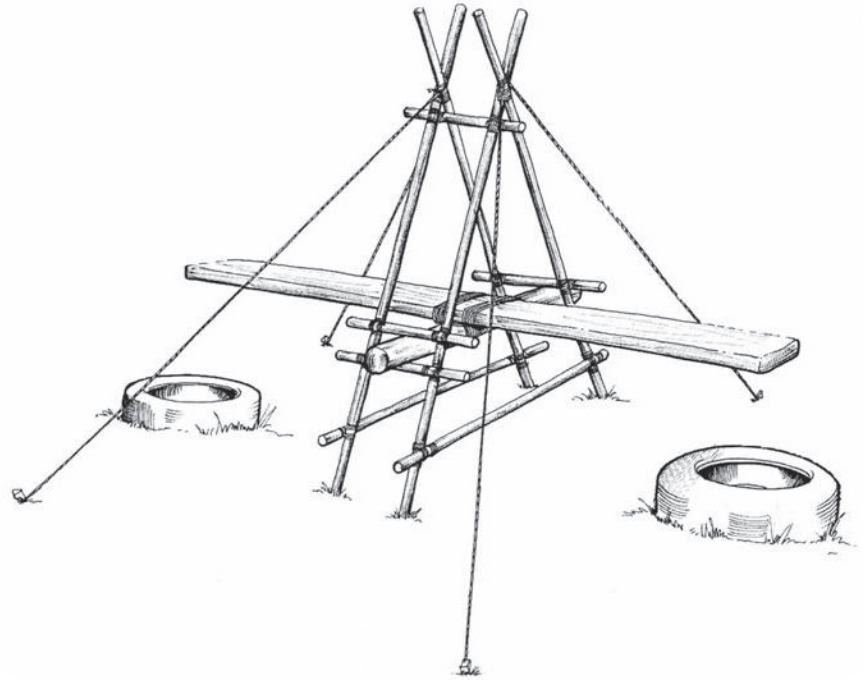
### Attach the guylines

10. With a roundturn with two half hitches, or rolling hitches, tie on the four guylines, one each about two feet below the square lashings at the top of the A-frames. Connect each to its respective anchor.



### Position the seesaw

11. Move the A-frames in the position you want the seesaw.
12. Drive in each of the four stakes away from where they're tied to the legs of the A-frames.
13. Connect a guylines to each using a roundturn with two half hitches or rope tackle.



### Lash on the plank

14. Slide the roller spar on top of the roller supports. Lay the plank on top of the roller and using the lashing rope, lash the middle of the plank firmly in place with a square lashing.

### Lay down the tyres

15. On each side, at the point where the plank hits the ground, place a tyre to cushion the impact and absorb the shock.

## Leverage Science and Safety

- Once you've built your seesaw, explain that the seesaw is a kind of lever.
- A lever is one of the simplest mechanisms. It uses a fulcrum to pivot between a load and a downward force to lift the load. When the loads are the same and the fulcrum is in the middle, the seesaw balances.
- The fulcrum on the seesaw is the roller.
- Ask the Group to see what happens when you unbalance the load. For instance, what if you sat two people on one side and one on the other?
- Try adjusting the position of the plank, so that the middle of the plank is no longer on the roller. Without a load, this will cause the longer end to touch the ground, but with the right load on the shorter side, the seesaw will again balance out.
- Remember that when using a lever like the seesaw, you need to keep the balance in mind. Suddenly putting pressure on or taking it off by letting go will cause the load to come crashing down or to jump up. This could hurt someone or damage something. For this reason, lower and raise the load carefully and if working with others, keep talking to them to let them know what you're going to do next. Never let go without warning and always be aware of where your feet are.
- What the lever is made of is important too. Use materials that you know can take the strain. An old, thin stick might snap and cause the load to come crashing down.



## Reflection

This activity demonstrated your pioneering skills. While the design of the seesaw is simple, the knots and lashings needed to be placed precisely. This meant that you need to slow down and think carefully before tying them.

- How many times did you check your lashings were correctly tied and tight enough to hold?
- Why might this be important, given what you've learned about levers and loads, and given the size of the seesaw you've built?

Planning ahead can be boring and get in the way of the fun, but taking your time to approach problems properly can mean a greater chance of success.

- How did everyone do their bit to help make the seesaw come together?

This was a chance for everyone to demonstrate their strengths, whether those were knot-tying, instruction-following, project-managing or seesaw-testing.

## Change the Challenge Level

### For less of a Challenge

- Make a model seesaw out of popsicle sticks and glue
- Teach younger Sections how to practice the knots used to lash together the A-frames on larger spars lying down

