

How to Build and Calibrate an A-frame



WHAT IS IT?

The A-frame is a hand-built tool used to find the contour lines of a site.

WHY DO WE DO IT?

It is impossible to see the contours of a site with the naked eye. When properly calibrated and used correctly, an A-frame ensures that water harvesting structures and planting areas can be constructed on contour so that water will spread out evenly across them.

TERMS USED

A-frame: A tool used to identify the contour of the land. Often used by smallholder farmers from materials found within their local community.

Calibrate: To ensure an instrument is measuring accurately. In this case, to ensure the A-frame accurately captures the contour of a landscape.

Contour: The contour of the land refers to the points within the landscape that are all at an equal elevation. An A-frame can be used to mark these points and join them into a line, which can be used to dig a water harvesting structure that is "on contour". By being on contour, the water is encouraged to infiltrate into the soils rather than running downslope.

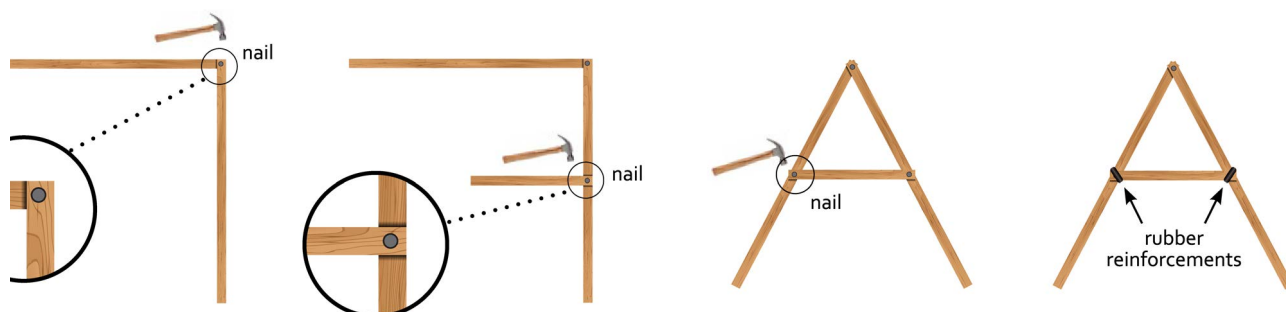


1 BUILDING AN A-FRAME

2 CALIBRATING AN A-FRAME

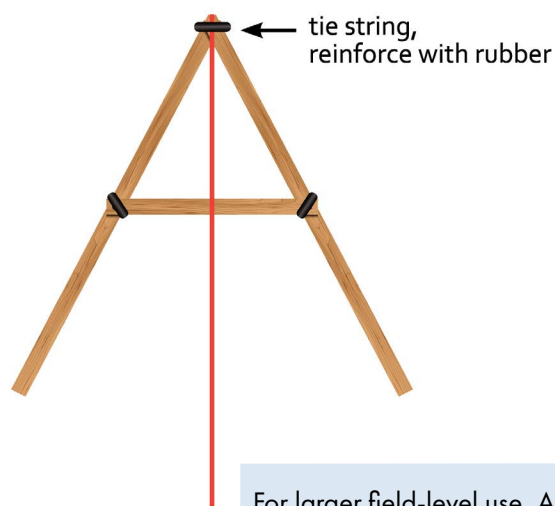
STEP 1

Make an "A" with the wood and secure the connections with nails and/or rubber (make sure to stretch the rubber tight).



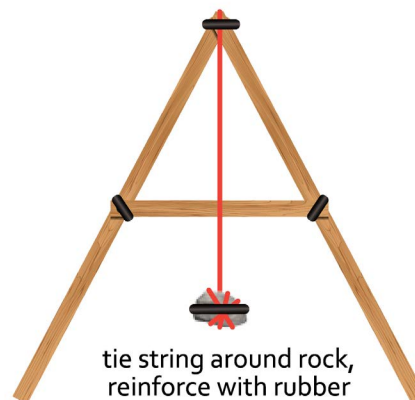
STEP 2

Tie a piece of string or twine at the top of the "A" so that it hangs straight down. Secure the string to the wood with a piece of rubber so that it does not become loose when used in the field.



STEP 3

Find a stone to serve as a weight and tie it securely to the string. It should hang 5–6 cm below the crossbar of the A-frame. Be sure the crossbar is smooth at the areas that intersect the string (i.e. no bumps, splinters, or holes) so that the string does not catch the wood as it sways.



For larger field-level use, A-frames can have a 2 meter wide spread between the legs. For household use, A-frames can have a 1 meter or less spread between the legs.

MATERIALS NEEDED

Pieces of lumber, branches, or bamboo that are approximately 2m x 5cm x 5cm (or thinner)



Saw



Marker

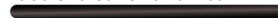
Rock



Hammer

Nails

Rubber strips from the inner tube of a car or bike tires



String that is minimum of 10 m (polypropylene rather than jute)

1 BUILDING AN A-FRAME

STEP 1

Place the A-frame so that both legs touch the ground. Elevate one leg of the A-frame about 3–5 cm off the ground using a stone or piece of wood. In the soil, mark where the leg of the A-frame and the stone/wood support under the other leg is resting on the ground. These markings will allow the A-frame to be rotated later and then returned to the same spot. Allow the string and rock to naturally stop swinging and then use a pencil or charcoal to mark the exact place on the crossbar where the string falls. Do not carve the mark with a knife because then the string will not swing freely as is needed.

STEP 2

Rotate the A-frame legs 180° so that the elevated leg is now on the mark on the ground and the leg from the ground becomes elevated. Be sure to place the legs on the existing marks on the ground. After the string and rock stop swinging, mark the exact place where the string stops along the crossbar of the A-frame with charcoal or a pencil. There should now be two charcoal or pencil lines on the crossbar.

STEP 3

Use a string, piece of paper, or blade of grass to measure the distance between the two marks. Fold it in half to find the halfway point. This is called the "center-mark." Mark the center-mark with pencil or charcoal. This center-mark completes the calibration.

