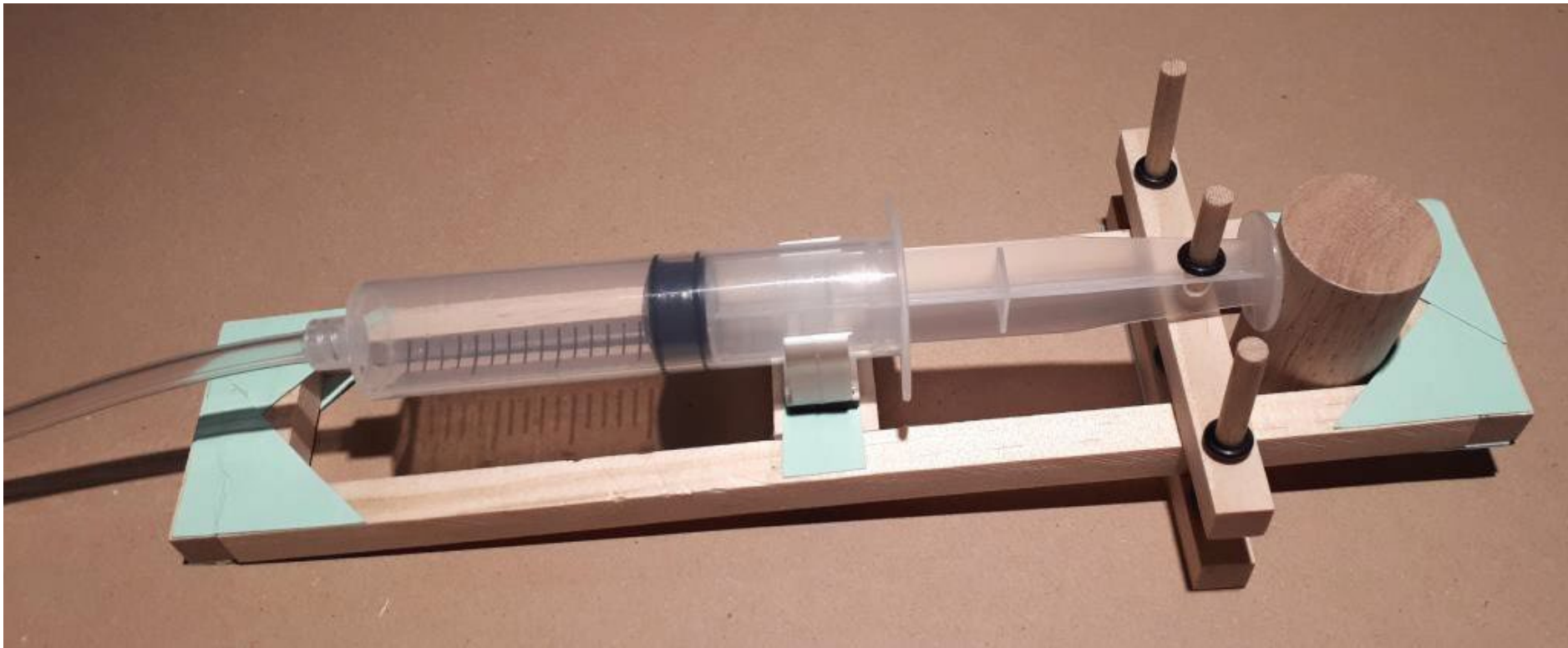


Pneumatic Clamp

Step-by-step assembly instructions



An example of linear-to-linear movement

Contents of Clamp Kit



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Wooden pieces ($\frac{3}{8}$ " – 10mm cross-section):

2 X $9\frac{1}{4}$ " – 234mm; 2 X $3\frac{5}{8}$ " – 90mm(drilled); 2 X 2" – 51mm; 4 X $1\frac{1}{4}$ " – 32mm
Green corner gussets: 1 card

Syringes, 20cc: 2 (1 has a hole in the plunger $\frac{3}{8}$ " 10mm from end)

Plastic Tubing: 1 length

Wooden dowel, $\frac{3}{16}$ " -5mm diam.: 3 X $2\frac{3}{8}$ " - 60mm

Syringe Holder: 1

Mini-washers: 3

Stirring Sticks: 1

Clamp Object: 1

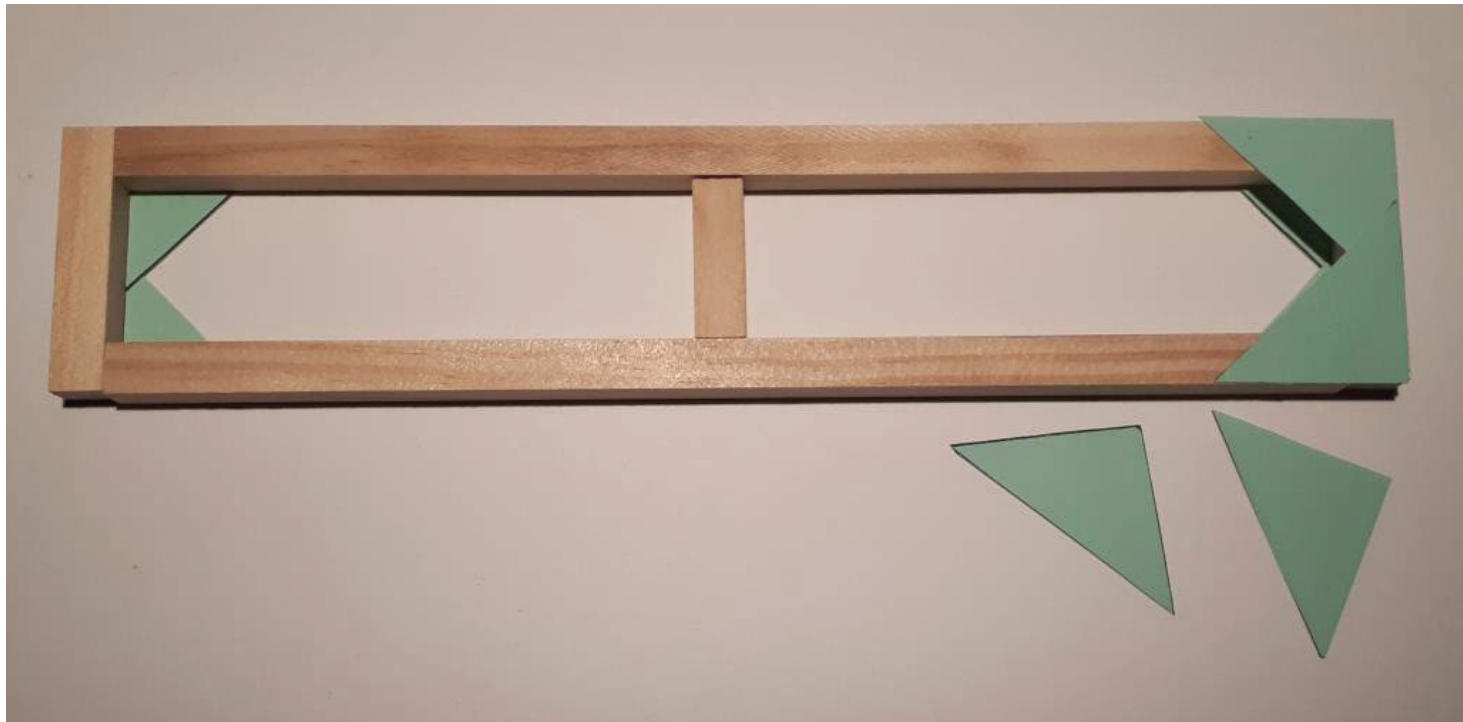
Plus a small piece of sandpaper

Make a 2 " by 10" (51mm by 254mm) frame using two 2 " - 51mm pieces and two 9¼" – 234mm pieces.

To join the pieces of wood together use a green triangle and a small amount of wood glue.

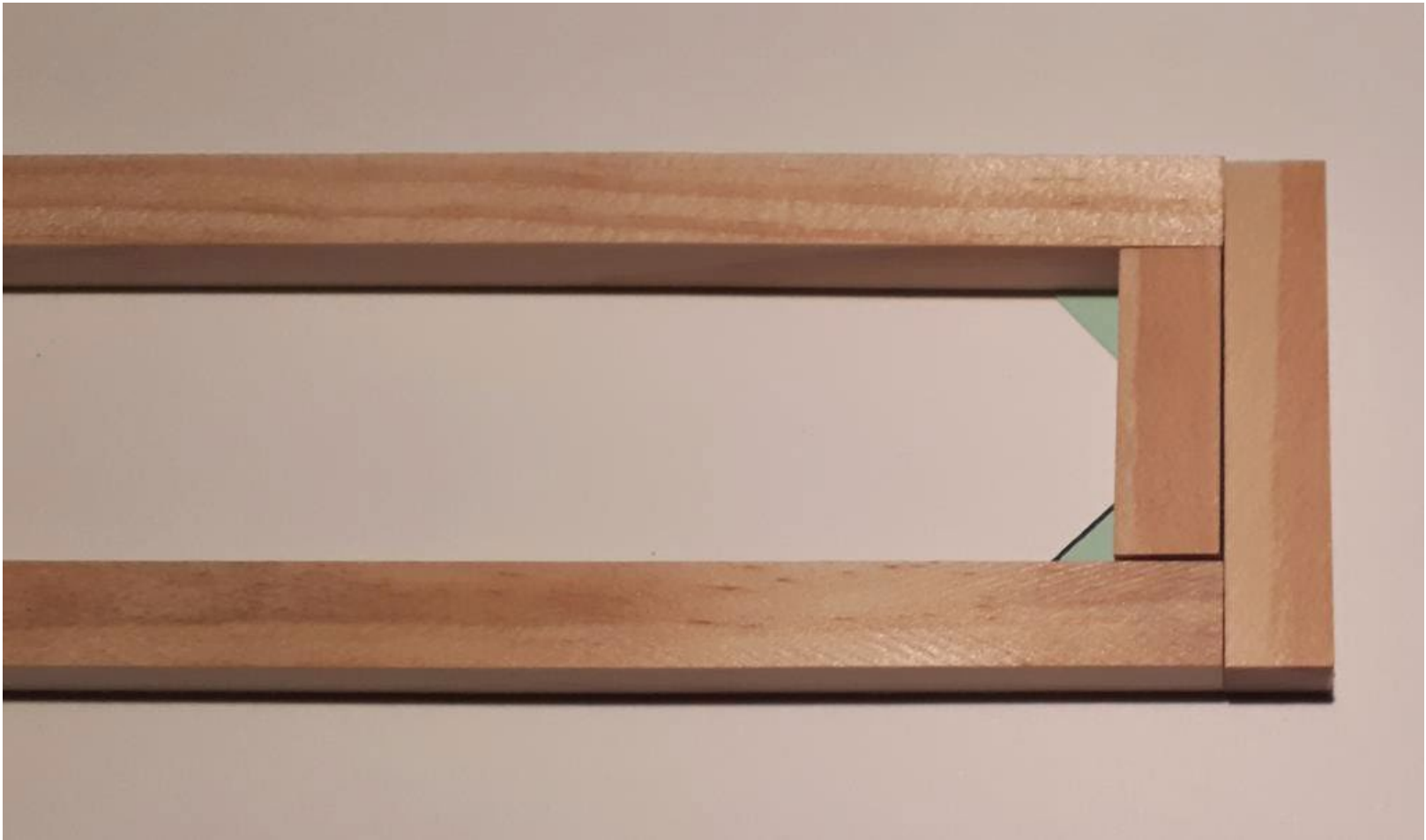
Use four corner triangles or gussets on one side only at first.

Place a 1¼" – 32mm piece of wood temporarily between the long pieces as a spacer to keep it square

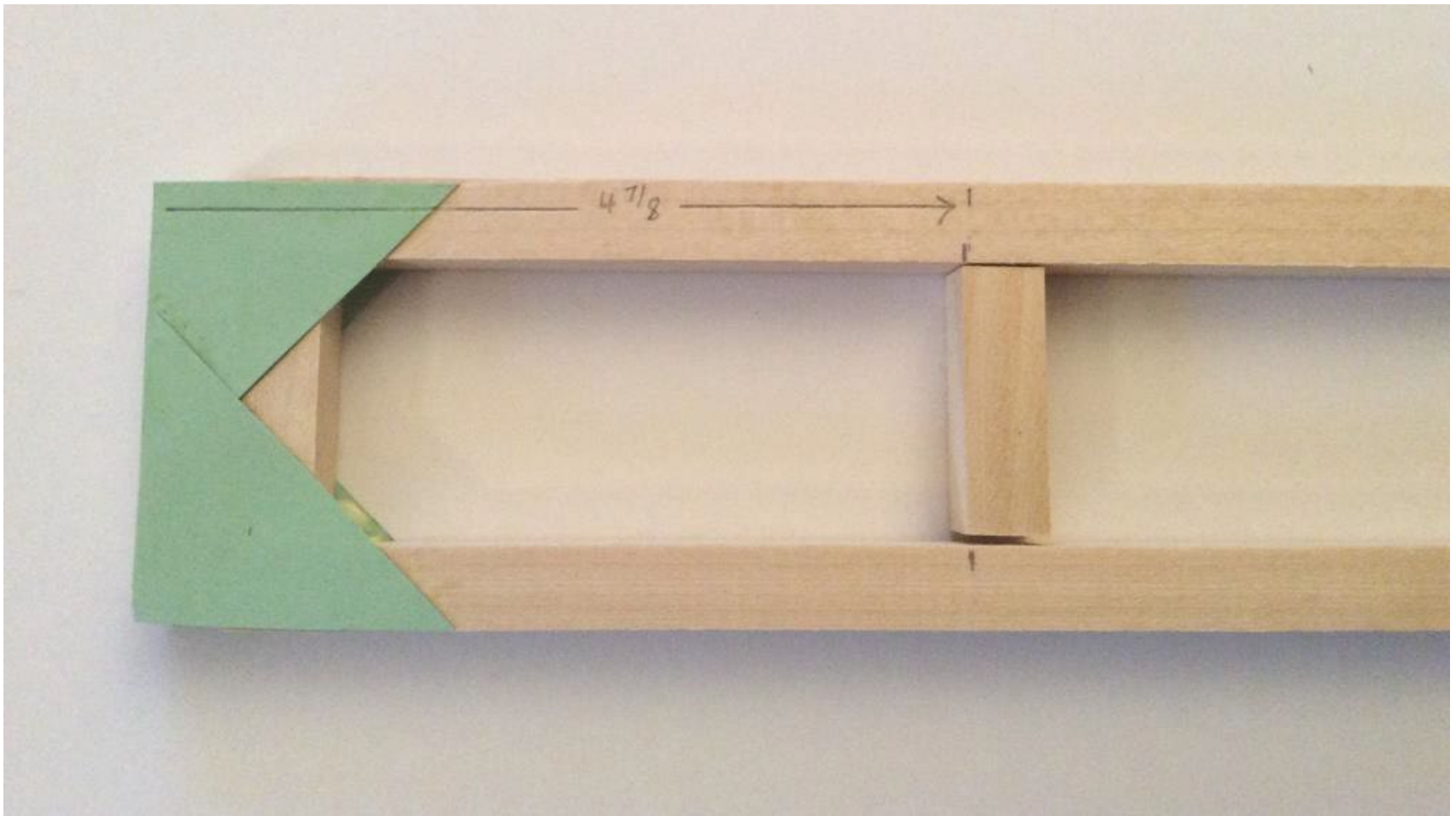


On the other side of the frame glue two 1¼” – 32mm pieces into the smaller ends.

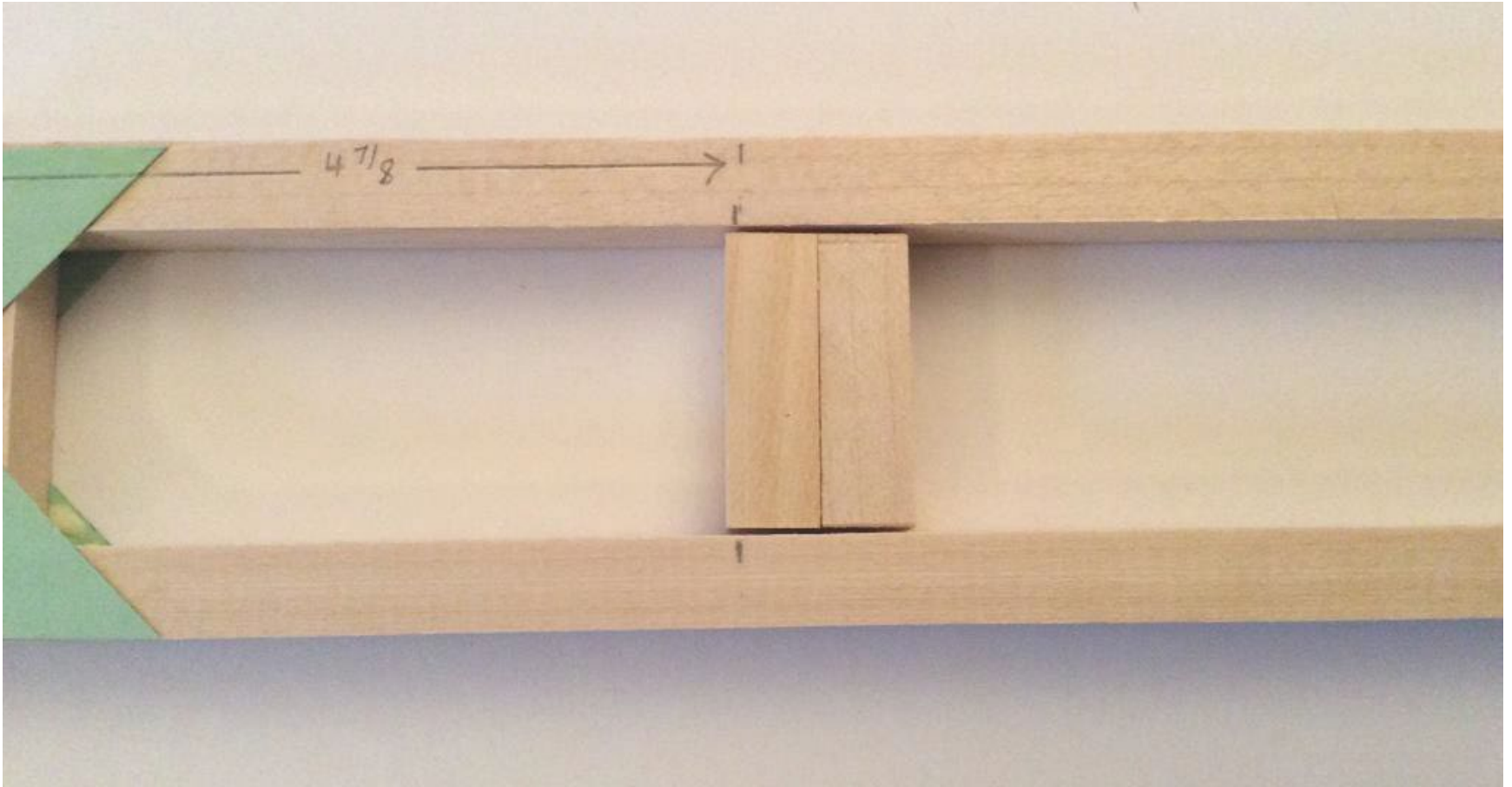
Secure them with glue and with four corner gussets, one on each corner.



Place a $1\frac{1}{4}$ " -32mm piece so that it lies between the long pieces of the frame
 $4\frac{7}{8}$ " – 124mm from one end

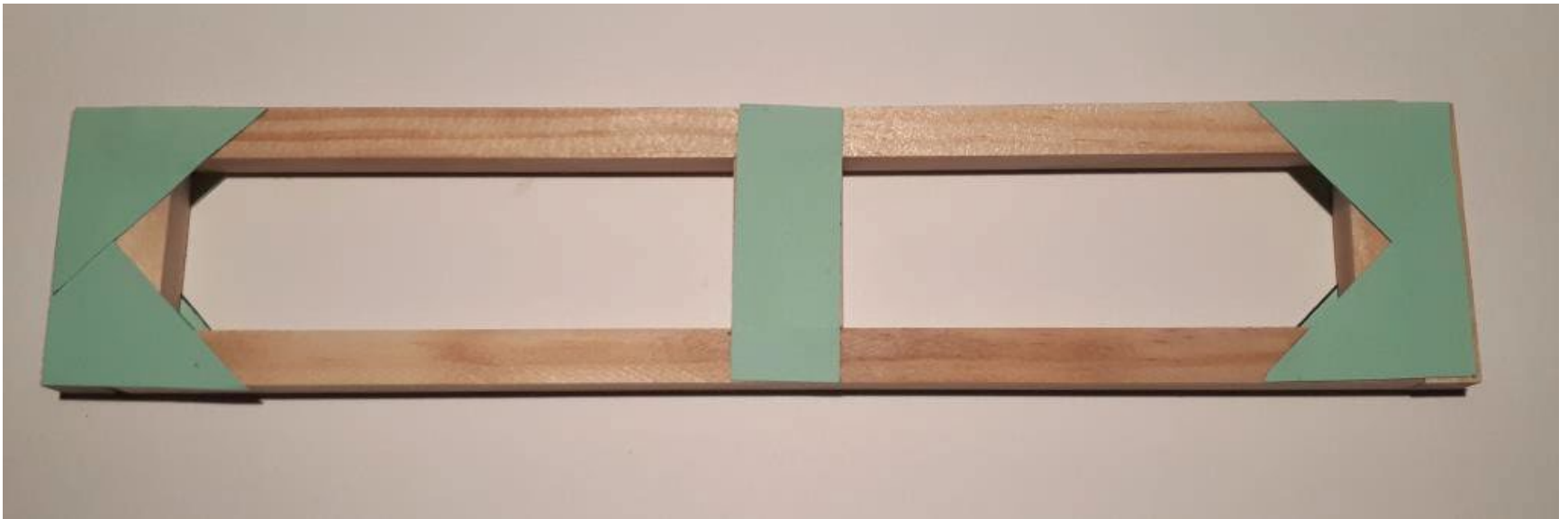


Place the last $1\frac{1}{4}$ " – 32mm piece alongside it away from the measured end



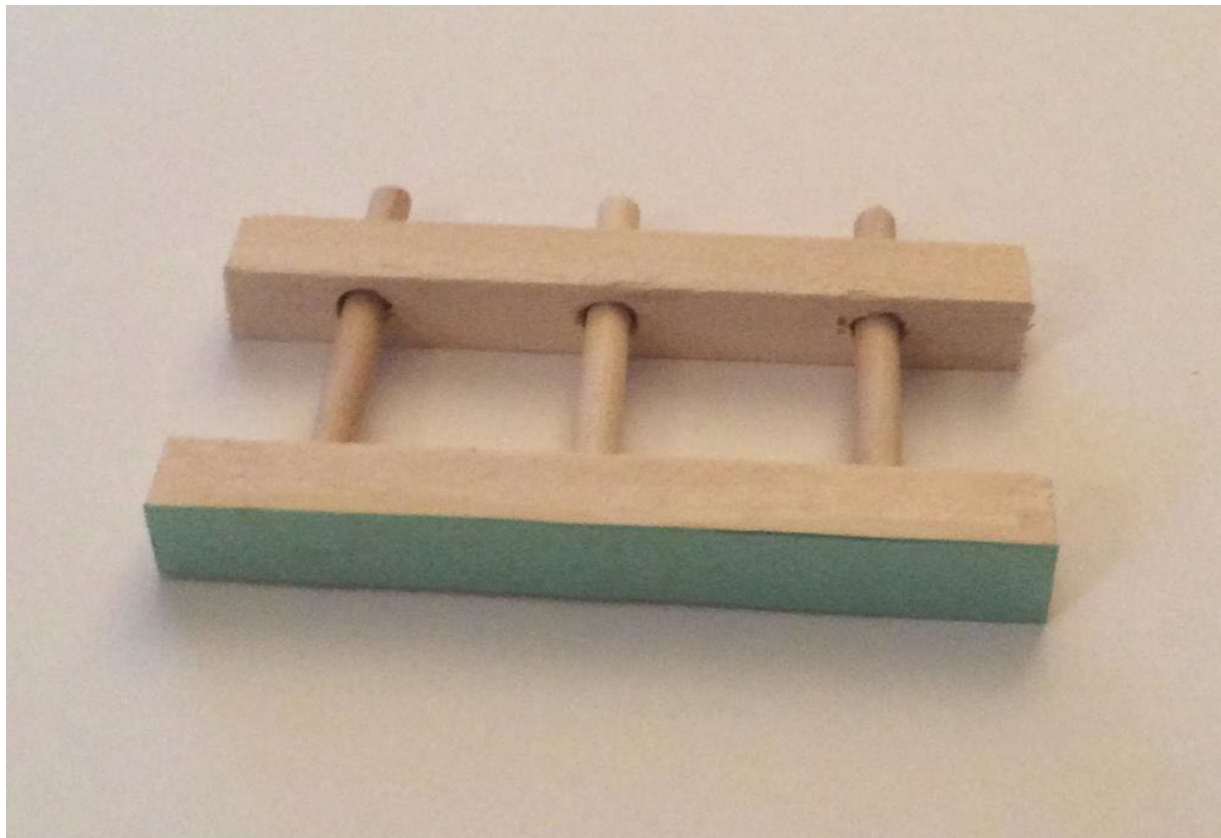
From the green gusset card cut a rectangle $\frac{3}{4}$ " by 2" - (19mm by 51mm) and glue it to secure the two $1\frac{1}{4}$ " - 32mm pieces to the frame.

Allow to dry otherwise the white syringe holder will not hold.

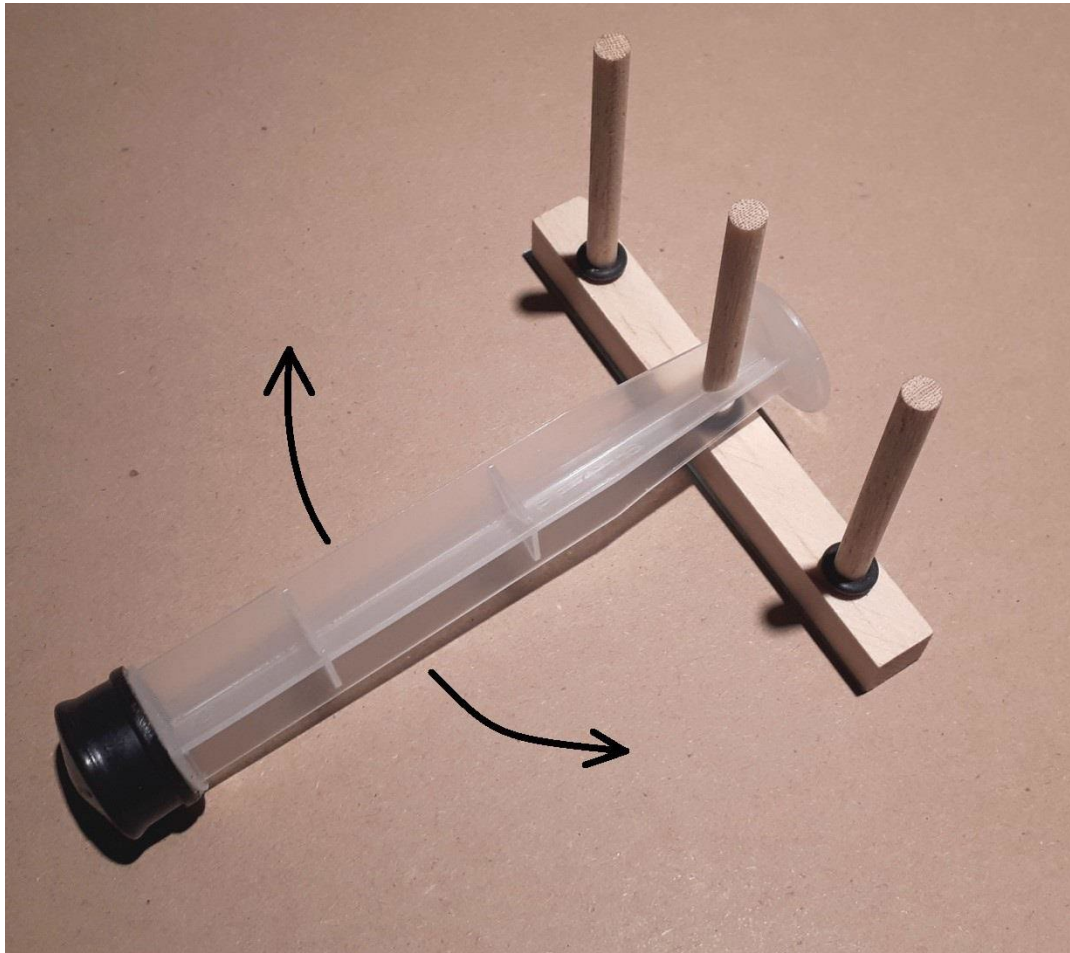


Glue the three $2\frac{3}{8}$ " – 60mm axles into the holes of a drilled $3\frac{5}{8}$ " – 90mm piece. The dowels are to be flush with one side and this is covered by a $3\frac{5}{8}$ " by $\frac{3}{8}$ " (90mm by 10mm) cardboard strip cut from the green card.

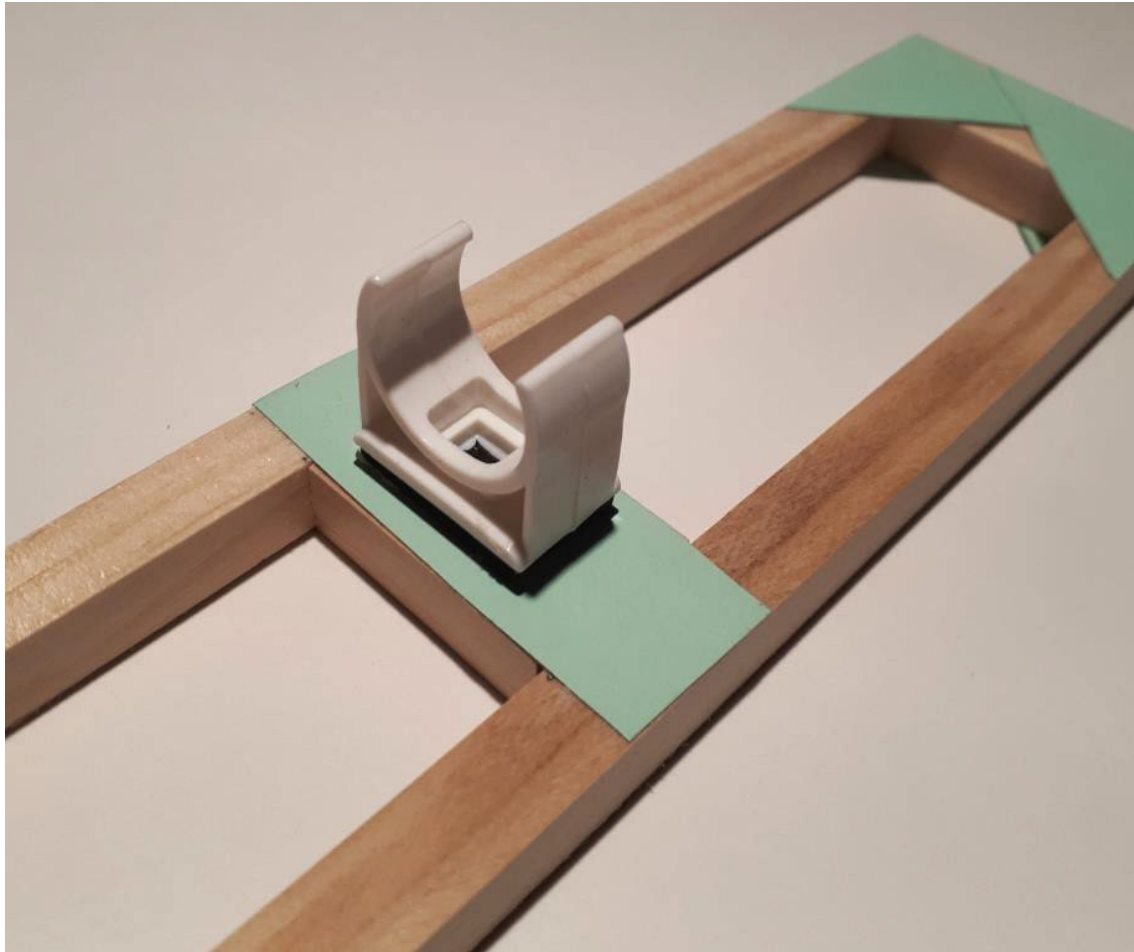
Use the other drilled $3\frac{5}{8}$ " – 90mm piece to ensure that the axles are perpendicular to both of the pieces.



Check that the plunger that has a hole in it turns horizontally when attached to the centre axle.

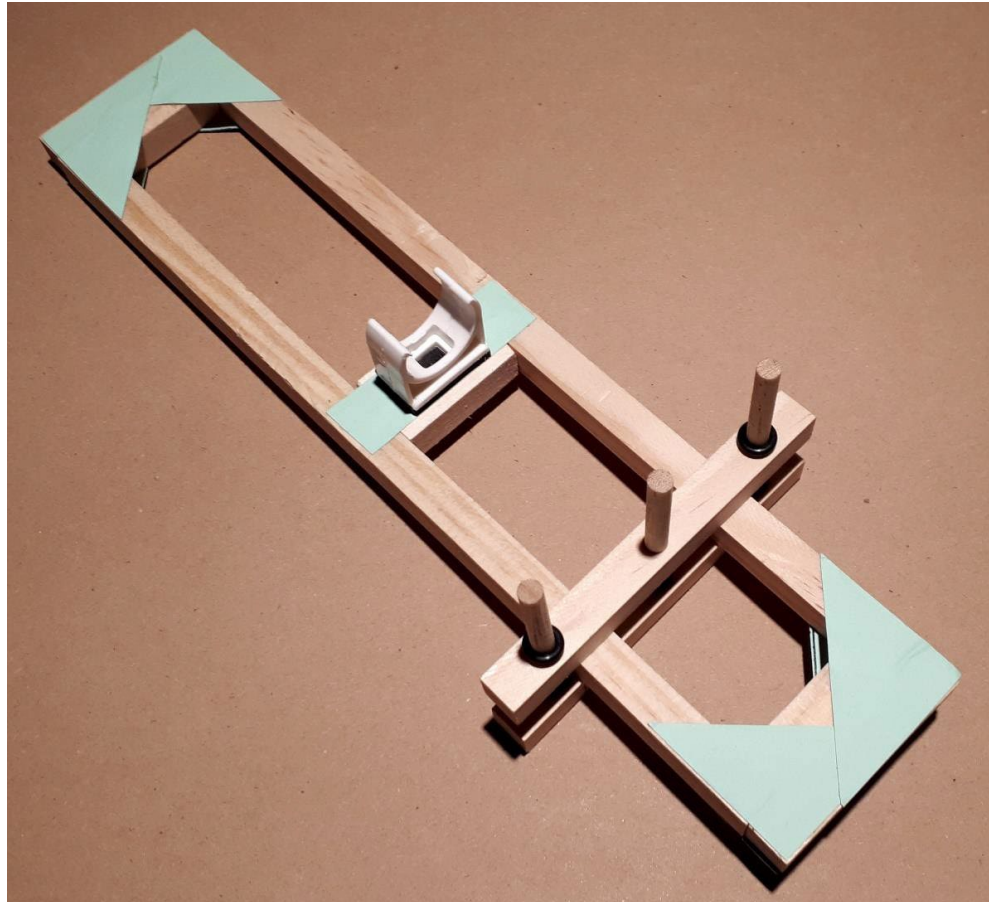


Peel off the backing tape from the white syringe clip and mount it onto the middle of the $\frac{3}{4}$ " x 2" (19mm by 51mm) card.



Attach the second $3\frac{5}{8}$ " - 90mm piece to the dowels so that the pieces are on different sides of the frame. The assembly should slide freely.

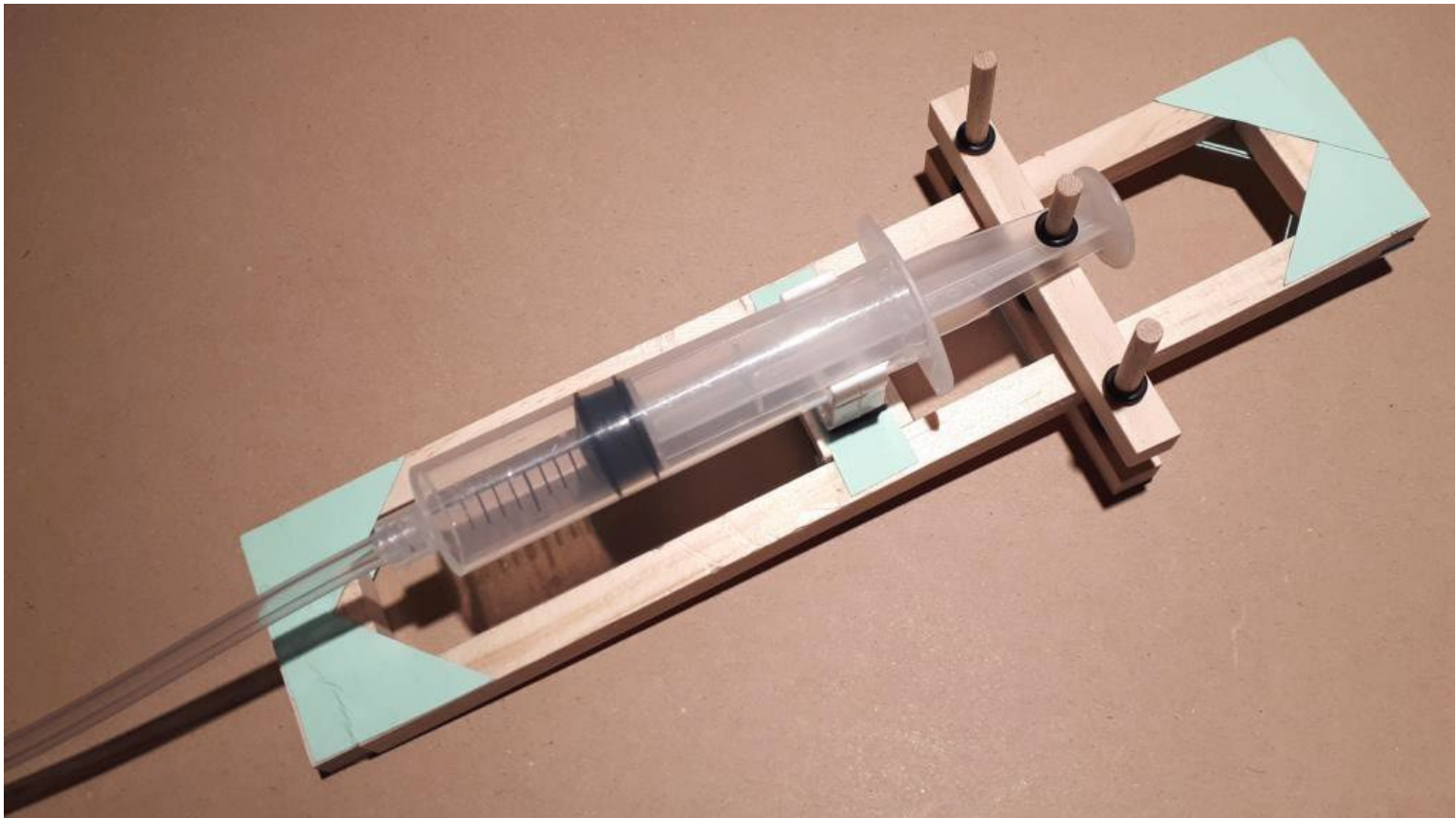
Finish with mini-washers on the ends of the dowels outside the frame



Push the plunger with the hole in it into its barrel and place the plunger onto the centre axle.

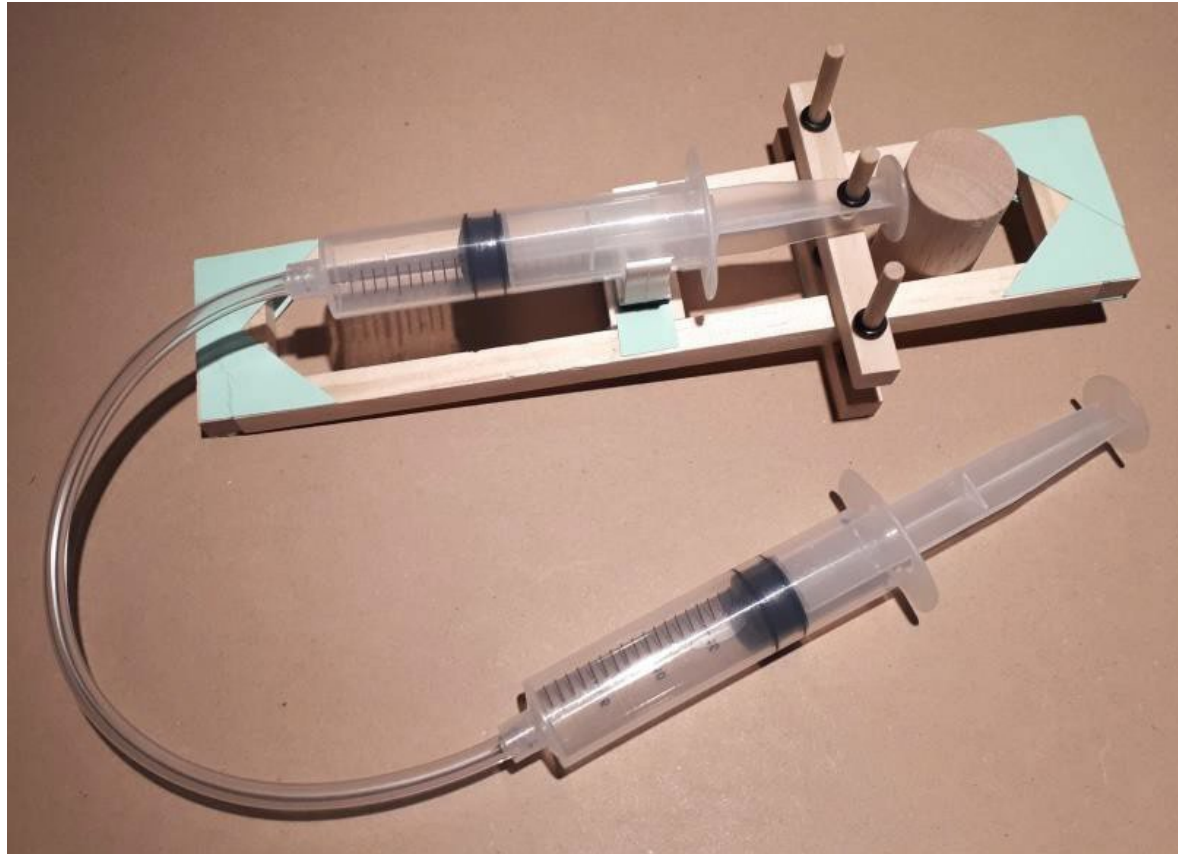
Secure the plunger with the third mini-washer.

Carefully place the barrel of the syringe into the syringe clip and attach the tubing to the syringe.



Carefully push the plunger into its barrel as far as it comfortably goes.
To operate the clamp, attach the other syringe, fully open with its plunger out, onto the tubing and then press its plunger in.

The clamp will close. Pull the plunger out and the clamp will open



Discussion point: How might the clamp be improved?