

# Fire Hose Heart Instructions

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Whether intentional or not, many enrichment items have more than one benefit. They benefit the animals that they are designed for, promoting naturalistic behaviours, reducing stereotypies and increasing wellbeing. Furthermore, they enrich the experience of visitors, allowing for the general public to see these naturalistic behaviours and watch animals interact with their environments in a positive way.

This is the purpose of this piece of enrichment. It allows the public to share a celebration, in this case Valentine's Day, with their most beloved animals. This shape also represents a novel shape to be chewed, swung from or simply sat on by the animals. This experience can always be heightened with the addition of scent or food items. It is particularly easy to push leaf matter between the woven fire hose. The fire hose heart will also last a long time, so even though Valentine's Day is only once a year, you only have to make these once and store them for the rest of the year!



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## Equipment and materials



Fig. 1: The required equipment.

## Items needed:

Good heavy duty scissors or a serrated knife  
Power drill  
10mm drill bit  
Socket wrench with 10mm socket  
10mm spanner  
7 pairs of M6 25mm nuts and bolts  
14 Penny washers  
Tape measure  
Marker pen  
Notebook and pen  
Fire hose

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## Step 1: Measuring and Cutting

To create the heart shape you will need 7 lengths of fire hose. You will need to pre-cut these according to the size of the heart you want to make, so it is important that you take the time to estimate how much fire hose you will need for each length. The most important measurement used to estimate these lengths is the width of your fire hose (fig. 2).



Fig. 2: Measuring the width of your fire hose.

This measurement is important as each length of fire hose has to pass over the others across their lengths. It is important that you follow this formula when cutting your lengths:

$$\begin{aligned} 2 \text{ short lengths} &= (6 \times \text{the width}) + 15\text{cm} \\ 4 \text{ medium lengths} &= (8 \times \text{the width}) + 15\text{cm} \\ 1 \text{ long length} &= (12 \times \text{the width}) + 15\text{cm} \end{aligned}$$

The extra 15cm that I have added to every length allows for the weave of the fire hose and 2.5cm at each end, which will be where the fire hose overlaps when bolted. You may find that you have thicker fire hose than what I am using, in this case add a little extra length to your calculation. It is better that the shape is too loose rather than too tight, as you can always trim off any extra. This is also why I suggest you use a notebook, record your measurements, and find the measurements that work best for you.



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From fig. 2, we can see that my fire hose was 10cm wide which means my measurements were as follows:

$$\begin{aligned} 2 \text{ short lengths} &= (6 \times 10) + 15\text{cm} = 75\text{cm} \\ 4 \text{ medium lengths} &= (8 \times 10) + 15\text{cm} = 95\text{cm} \\ 1 \text{ long length} &= (12 \times 10) + 15\text{cm} = 135\text{cm} \end{aligned}$$

After you have your measurements, you're ready to measure and cut your fire hose (fig. 3).



Fig. 3: All of the lengths of fire hose required to create the heart shape.

After you have cut your lengths of fire hose, you will need to drill holes at each end so that you can bolt them together. This is where the 2.5cm that I added to each end of the measurements is important. Using a tape measure mark a point on the ends of each piece of fire hose that is in the middle but also at least 2cm from the edge, as shown in fig. 4.



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Fig. 4: Measuring and marking the holes to be drilled into the ends of the fire hose.

When drilling these holes, it is important that you have something safe to drill into underneath the fire hose. I use an old wooden stump. It is also very important that the holes on each end of each length are lined up. To do this, drill the first hole and then fold that length in half so that the ends are on top of each other (fig. 5). After you have lined up the ends, drill a hole into the other end in line with the first. Doing this will ensure that even if you drill the first whole off centre, both holes will still overlap when looped.

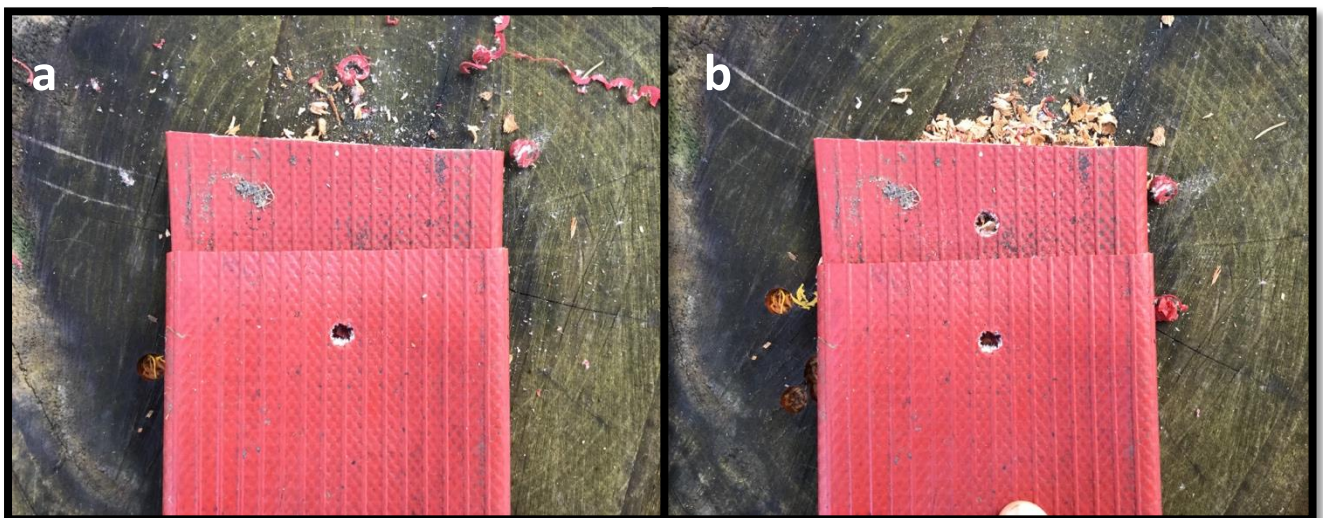


Fig. 5: Lining up the ends of one piece of fire hose to ensure that the drilled holes are in line.



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After you have drilled holes in the ends of all 7 lengths of fire hose, it is time to bolt them together. Use the socket wrench and spanner to tighten the nuts and bolts together and do not forget to place a washer on both sides of the fire hose. This will stop the bolt falling through if the hole is too big, but also will allow you to easily unbolt these lengths if needed. You should bolt all of the lengths except the long length. You will weave the long length through all of the other loops later.



Fig. 6: The short and medium lengths looped round and bolted together. The long length is left unbolted.

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## Step 2: Weaving the Fire Hose

Weaving the fire hose in loops should make this build a little easier than trying to bolt the lengths after weaving. To start we need to take the medium lengths and build our heart from the bottom up. When weaving fire hose remember that each length of fire hose should follow a pattern of over, under, over, under etc. As you weave the loops into each other try and hide the bolts. Hiding the bolts now will be easier than trying to do this later when the heart is formed it will be harder to hide the bolts. Fig 7a and 7b show how bolts can be hidden as we weave the loops.

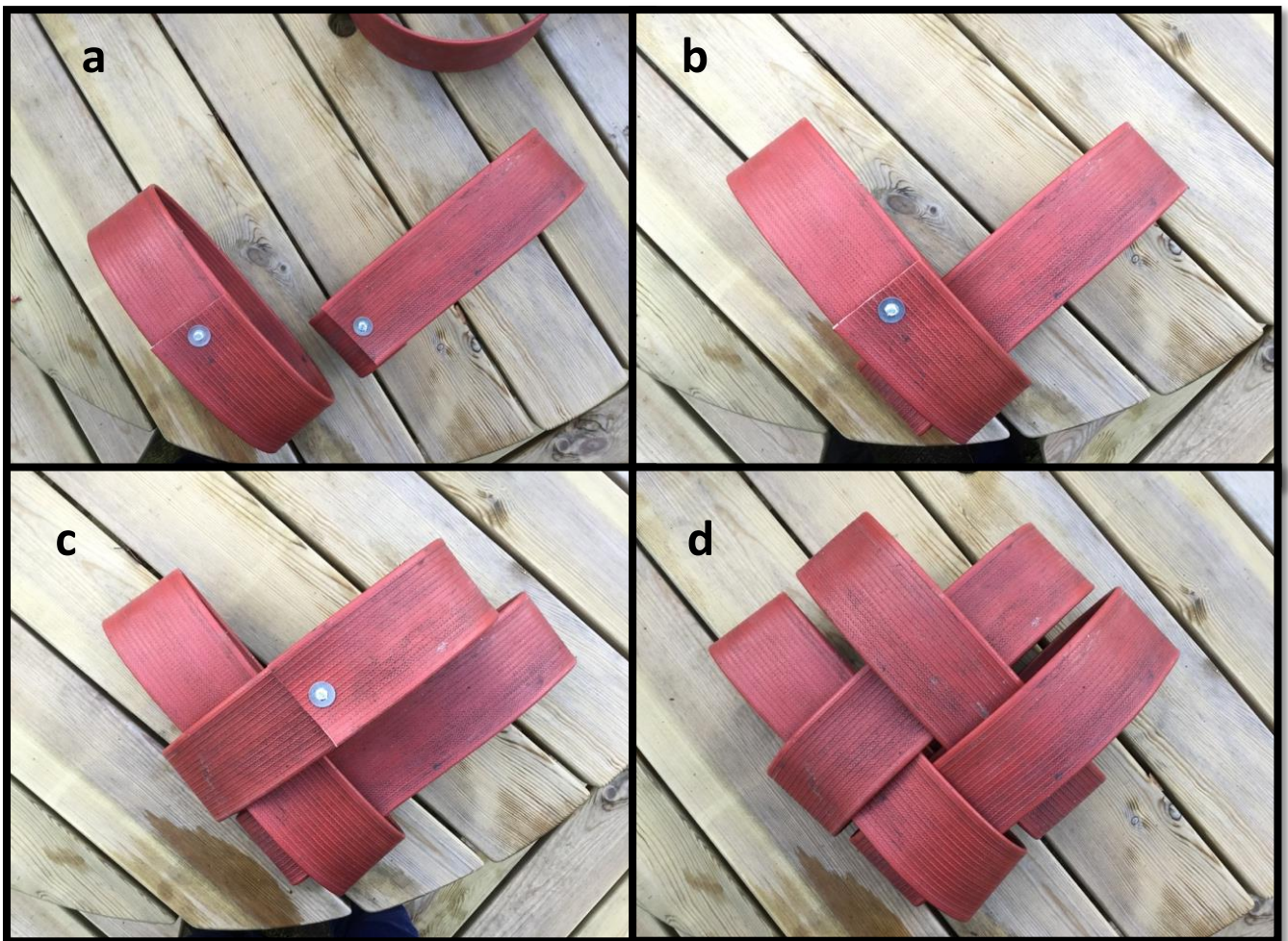


Fig. 7: Weaving the loops into each other while hiding the bolts underneath the overlapping fire hose.



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All 4 of the medium loops should be woven in the way shown in Fig 7. As you can see the heart shape is coming together. To weave the loops we have to alternate between tucking a loop through one loop and around the next. I have included a side view in Fig 8 to help visualise this.

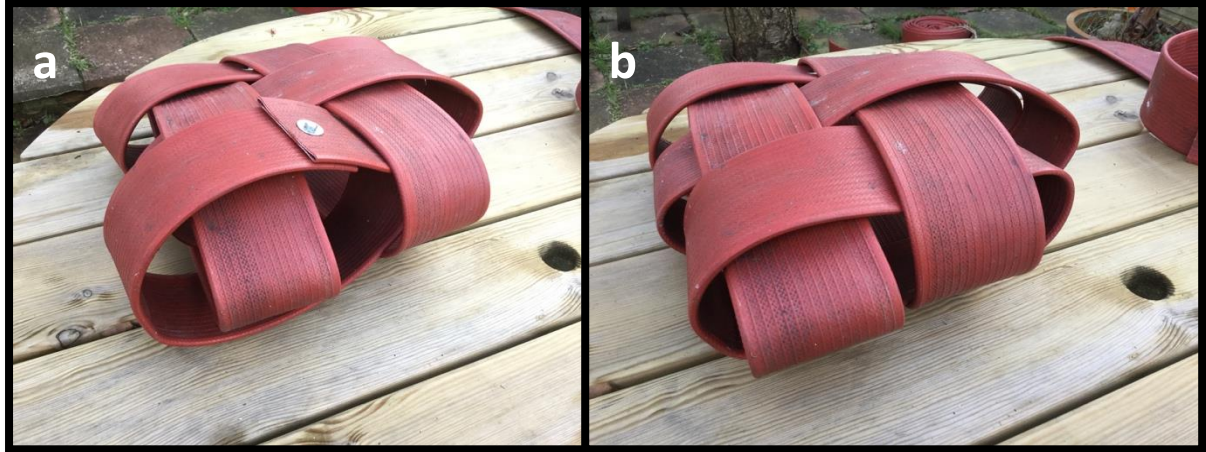


Fig. 8: How to weave the loops. The loop in the foreground has been looped around the first intersecting loop and then it has been tucked in the second intersecting loop. During this process the bolt has been hidden.



Fig. 9: All of the loops woven together into the shape of a heart.

The loop is woven around one loop and then tucked through the next, hiding the bolt in the process. The next step is to take the small lengths and weave these in the same way as the medium lengths but this time we are only weaving them through two loops to create the shape in Fig. 9.



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Hopefully this has been easy so far. At this stage, the loops can fall out of place. They are not difficult to put back. The next step is to weave the long length through the outside of this shape. Fig. 10 shows the process of weaving over and under the outside of the heart.

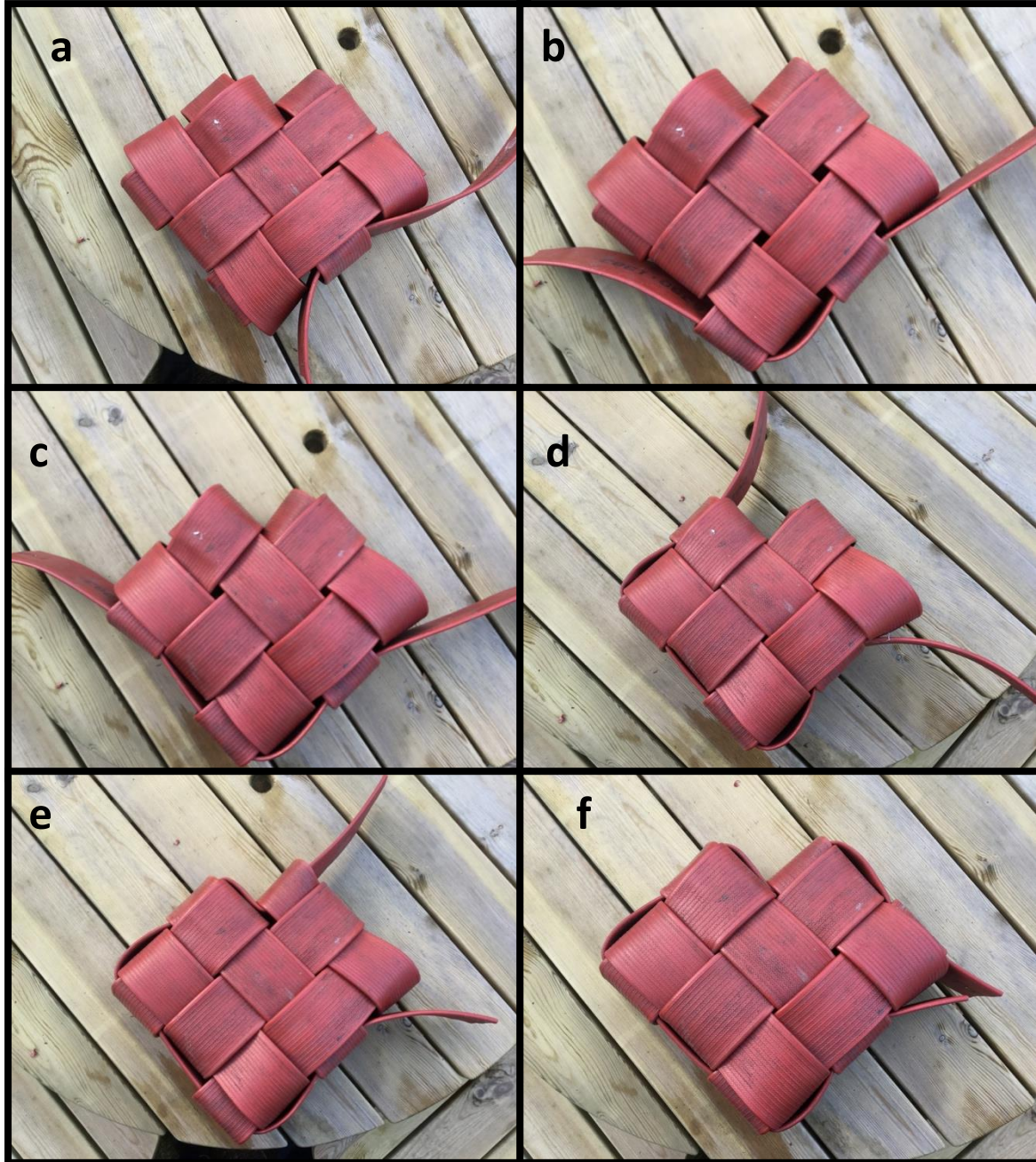


Fig. 10: Weaving the final length around the outside of the fire hose heart. Make sure that all intersecting lengths of fire hose are following the over, under pattern.



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At this point you may find that you have too much fire hose and you may want to trim a little off and drill a new hole (Fig. 11a). After your holes are lined up, you need to use the final nut and bolt (don't forget the washers) to secure the final length (Fig. 11b).

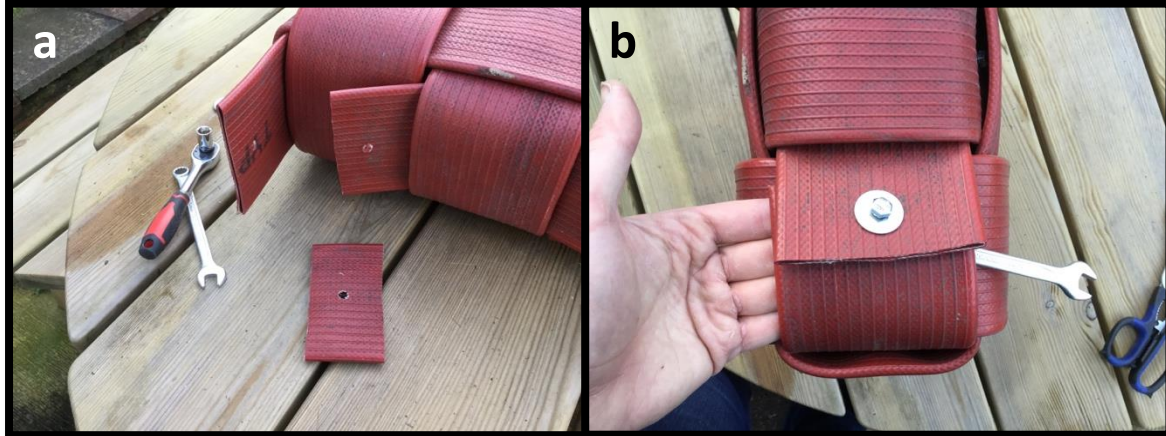


Fig. 11: The final length of fire hose has been woven around the heart and is read for bolting. I found that I had a little too much fire hose, after trimming this off and drilling a new hole I bolted the ends together.

**Work the final length around the heart to hide that final bolt and you're done!**

## Optional Extra

At the moment, your fire hose heart is perfect as a chew toy to be left in an enclosure. However, with rope and some splicing knowledge, you could hang this in an enclosure.



Fig. 12: When the final bolt is pulled around and hidden underneath an overlapping piece of fire hose the heart is complete!



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The best way to hang the heart is a simple loop threaded through the woven fire hose. Insert the end of the rope through the top of the heart (fig.14a). Then pull this rope through and out of the heart (fig 14b, 14c).

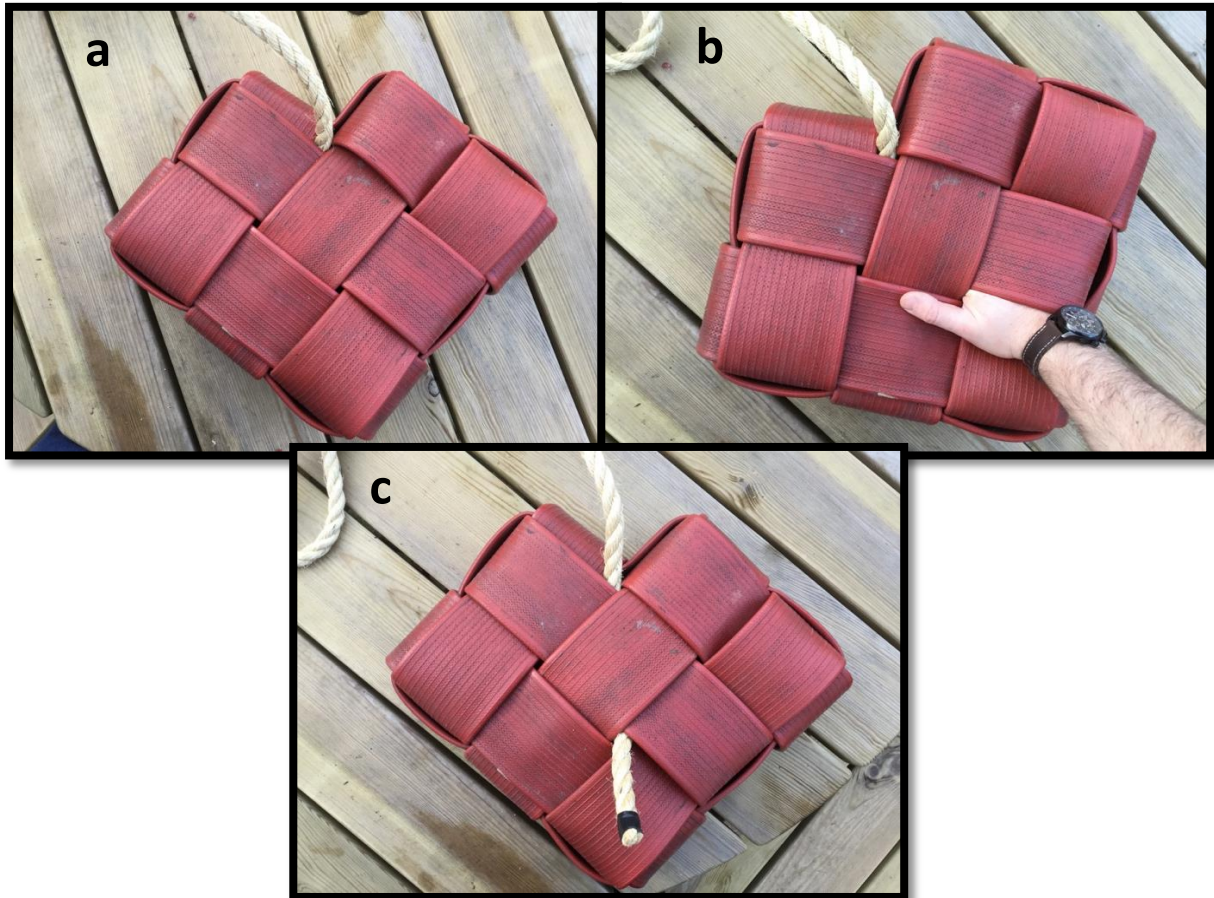


Fig. 14: The rope is threaded through the top of the heart and pulled out through the middle. The tighter your heart the harder this will be.

Now is when the ability to splice comes in handy. I am not going to go into how to splice in this guide, however there are plenty of guides on the internet. Splice the rope back on itself which will create an eye slice with part of the heart trapped within it (fig. 15a, 15b). The length of rope that you should be unwinding to splice back onto itself depends on your target animal, the bigger the animal, the more rope you need to splice onto itself.

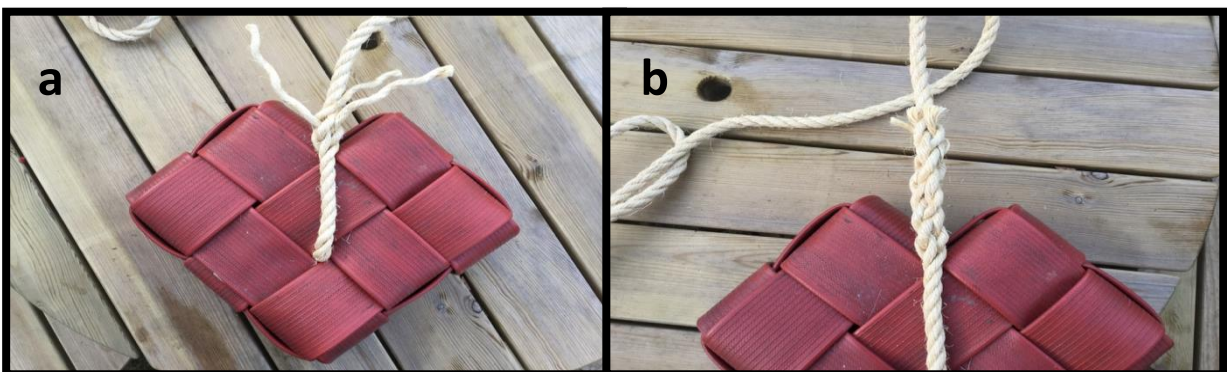


Fig. 15: The end of the rope that was threaded through the heart is now spliced back onto itself.

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Finally, you are ready to hang the fire hose heart in an enclosure!



Fig. 16: The heart is now ready to be hung.