

Content

Introduction (this page)

Part list

How to make pages

Introduction

Can you make a marble roll for 20 seconds? This marble run kit can be used as shown or in variations of your own. The example shown performs the following and is explained on the next few pages:-

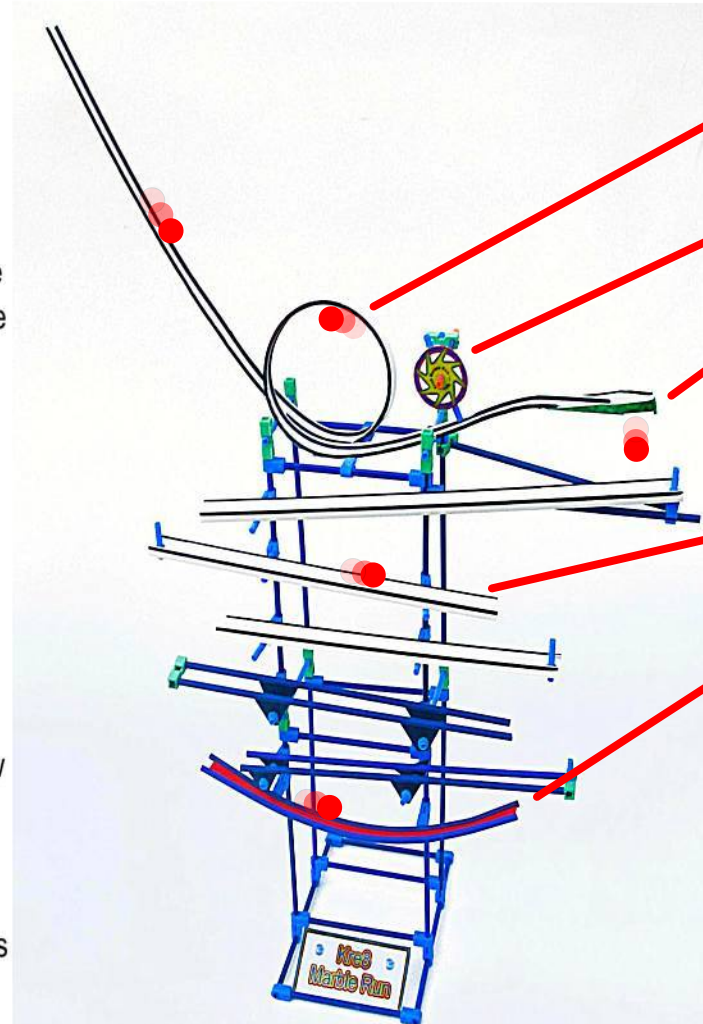
The marble starts by travelling fast down a track towards and through the 'loops the loop' part which then exits and 'spins a disc', before stopping and dropping down onto track which then guides the marble onto the next three track in the same way then it drops onto two more adjustable width tracks, At the end it reaches the low friction curved roll part where the marble rocks 'back and forth' for many seconds. The total marble rolling time being over 20 seconds. Parts can be adjusted to achieve the slowest longest run by altering the how steep the track is.

Extra

1) Make sound or musical feature - made by or triggered things as the marble travels. 2) Devise a way to release the marbles remotely.

Energy Conversion

Many forms of energy conversion and control takes place



An amusing mechanism that gives hours of fun

'Loop the loop'

'Spinning disc'

card end stop

Height 0.8m

Back and forth

Low friction roll

Learn about:- rolling resistance, friction, kinetic energy, potential energy, gravity, centrifugal force, structures, and the need for an efficient mechanism otherwise the marble stops.

2

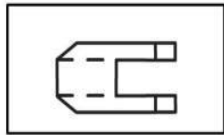
Kre8® Marble Run (Version 2) - Parts List



Note - Some parts need cutting to size, bending etc - see tools



11 x Clip connectors (blue)



1 x sheet of white card
(to make stop and drop [see web page 7](#))



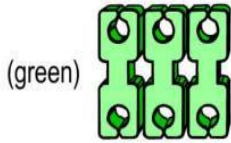
22 x Blue collars



2 x short piece of
5mm bendy tube

Red plastic strip

1 x red plastic strip
(at least (15mm x 28mm))



(green)
5 x Multiblocks



1 x printed page (laminated)
(note for packer - cut in half)

Instruction Note
Ensure you Look at
[Version 2 kit on web](#)

Paper insert

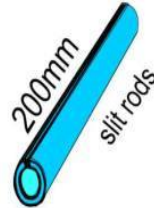
Web and safety tips



1 x 5mm diameter
(for use with
spinning wheel)



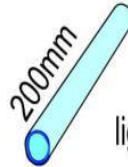
8 x 5mm dia.



13 x 5mm dia.



6 x 5mm dia.



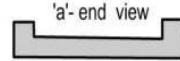
6 x 5 mm dia.
light blue tubes
(one extra to allow for experimentation)



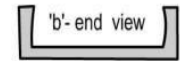
1 x 2mm dia. steel rod

Blue plastic

1 x plastic sheet
(1/2 standard sheet)



'Loop the loop' strip
1 x 1metre long



3 x 280mm approx
(Note - may be supplied as
same section as 'a' above)



2 x Marbles
(16mm dia.)



**Care needs to be taken with all sharp tools -
Students under 9 years old need to be supervised by an adult.**

Trim all sharp edges
after cutting

Tools

Snips (or wire cutters and string sharp scissors)

Use to cut Kre8 connector hinges,
plastic sheet, light blue tubing
(the serrated blades are better than smooth blades).



Emery Cloth

Assembly is easier if you use fine 'emery cloth' or other
'abrasive paper' to round and smooth the slit rod or blue
tube ends.

Abrasive paper

Pencil and Rule

Use to mark lengths of blue tube or slit rods before
cutting. Can also be used on plastic sheet before
shapes are cut out. (FREE rule at bottom of page)



clear plastic tape

pliers



Side cutters



5m hole punch



Can use small saw and vice
to cut rods (or use Kre8 cutter)
also can cut ends of blue
clip connector

OPTIONAL EXTRAS



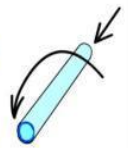
Kre8 cutter

The rods are easier to insert into the connectors if twisted as they are pushed into place. Younger students should 'round off' and smooth the tube and rod ends.

3

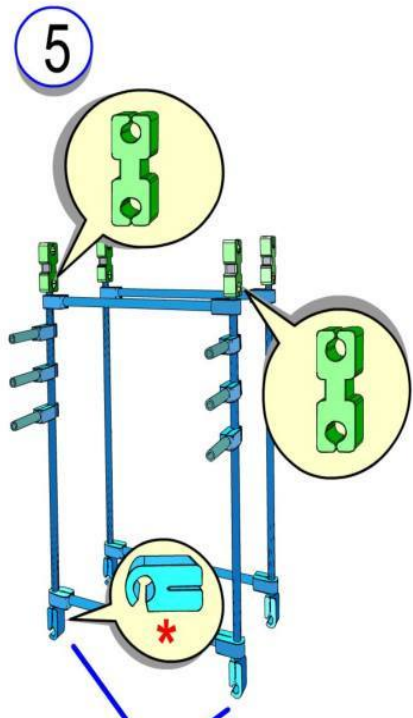
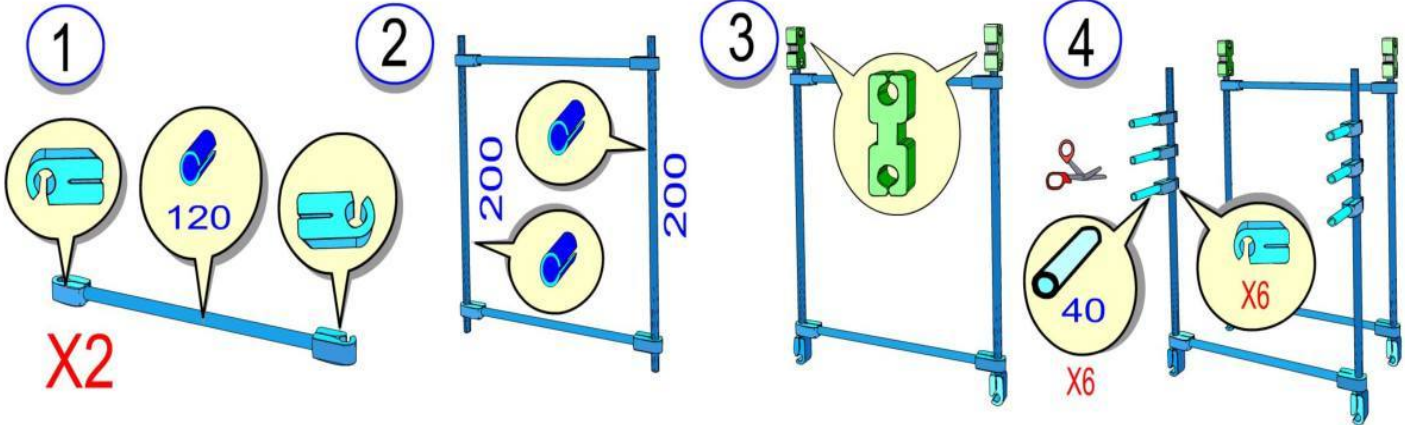
Kre8® Marble Run (V2) Making a Possible Frame - 1/2

Note - To make assembly easy smooth and round the ends with **abrasive paper** before pushing and twisting into the connectors.

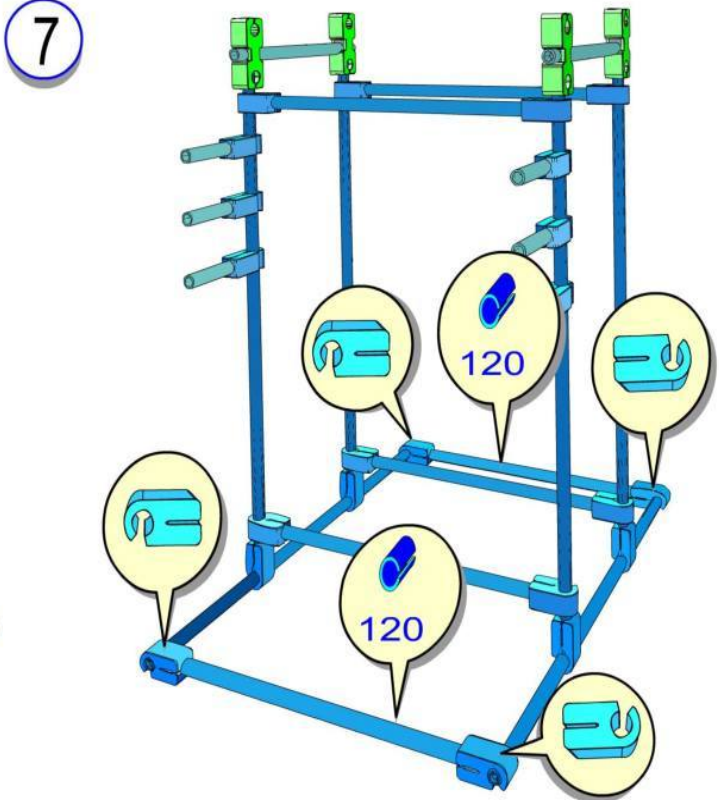
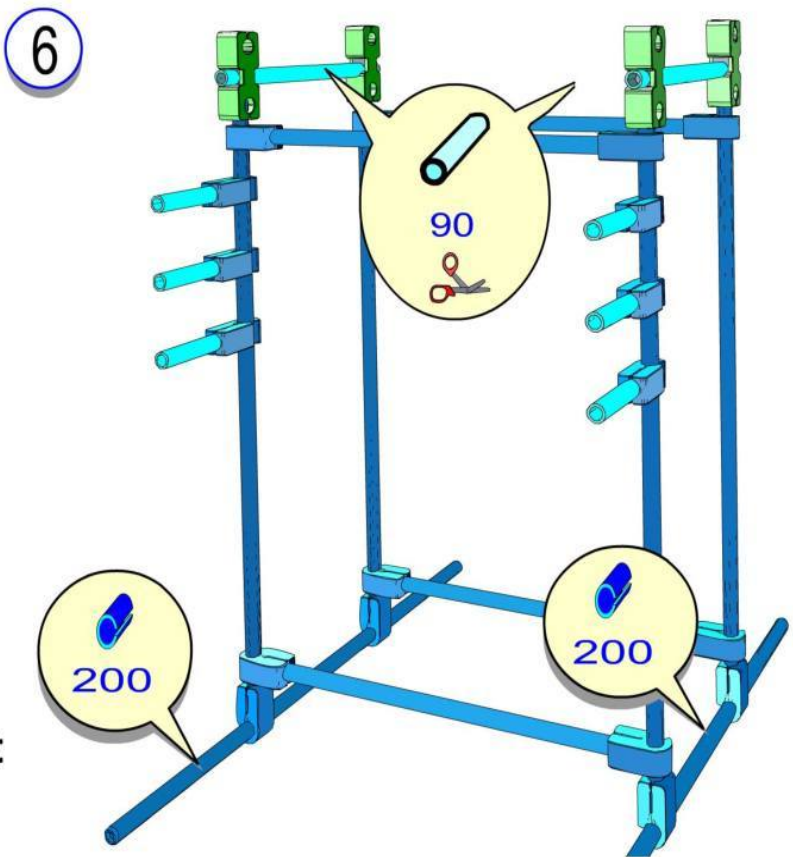


All sizes in mm

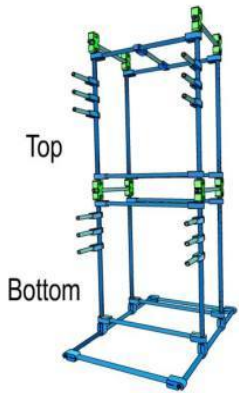
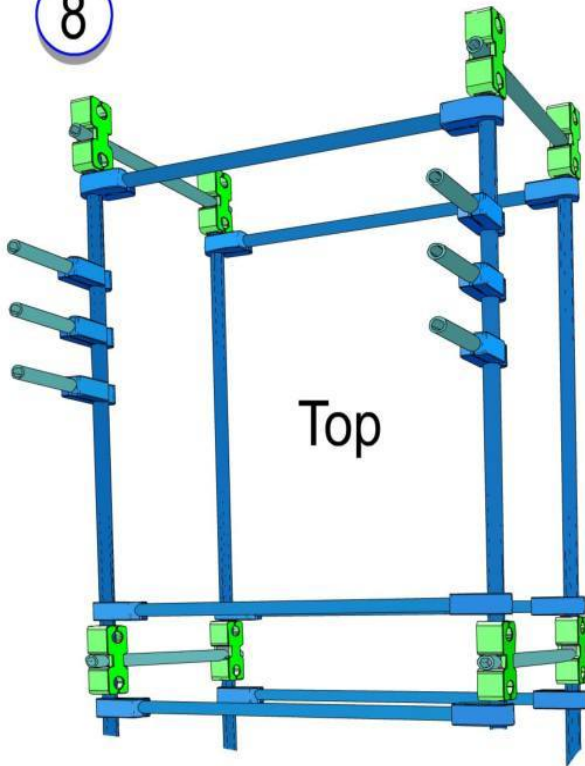
*Light blue tubes can be cut to length



*Note - Clip connectors not needed when making TOP part on next page .

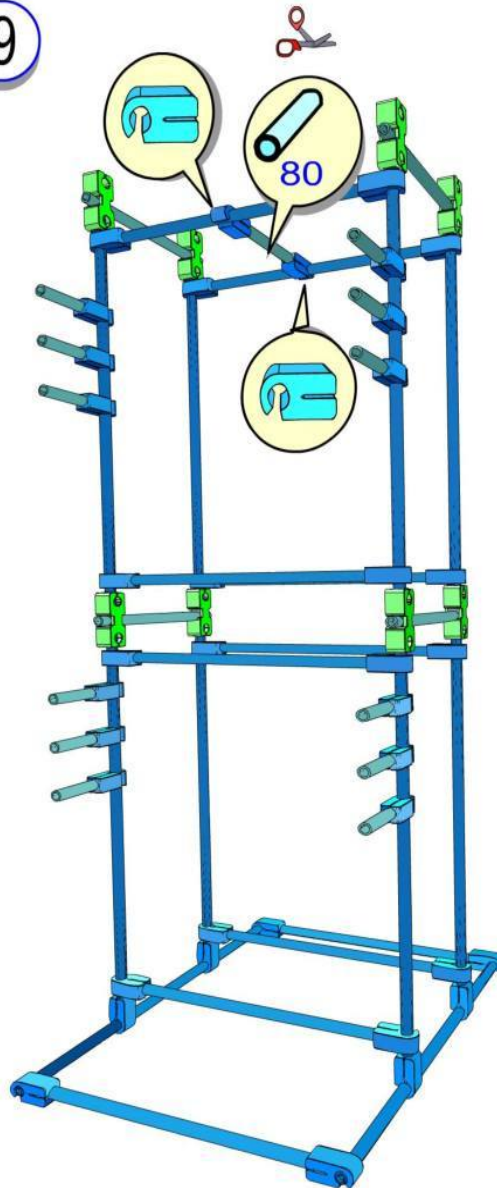


8

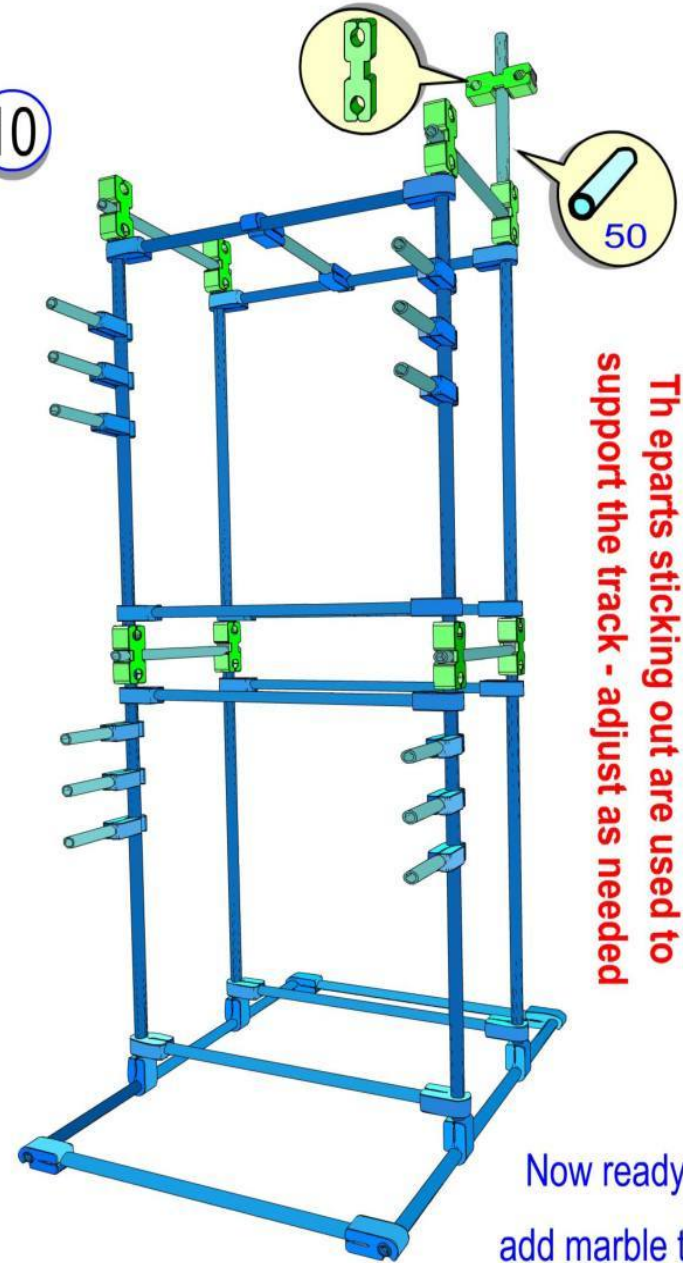


Make top part like the bottom part (but without wide base) then add it to the bottom to make it twice as high like this.

9

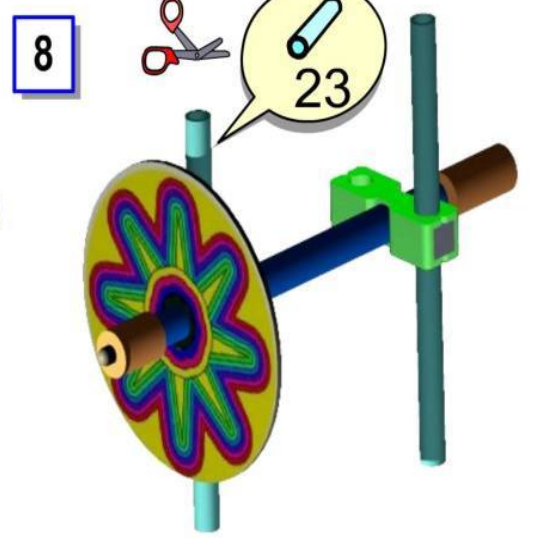
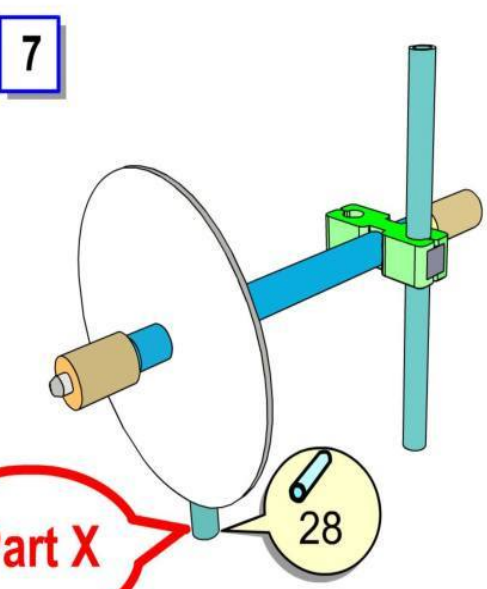
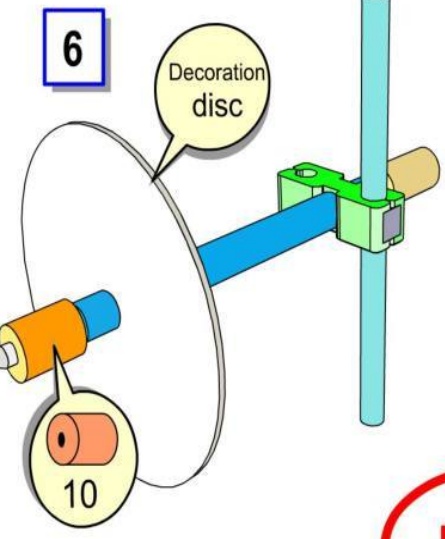
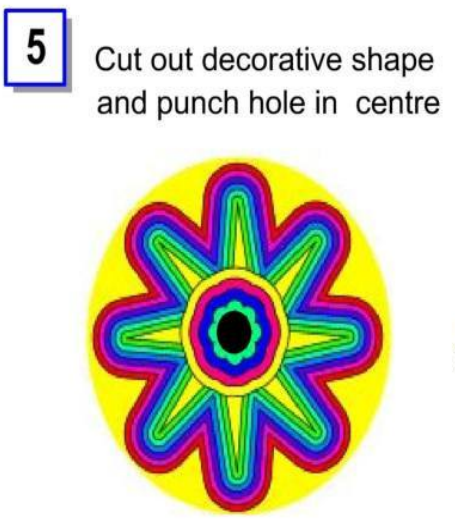
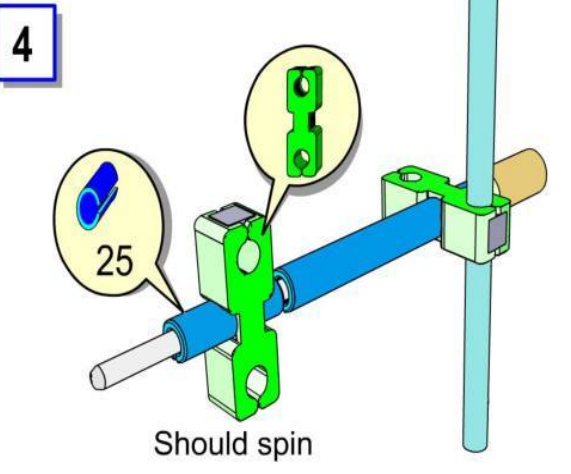
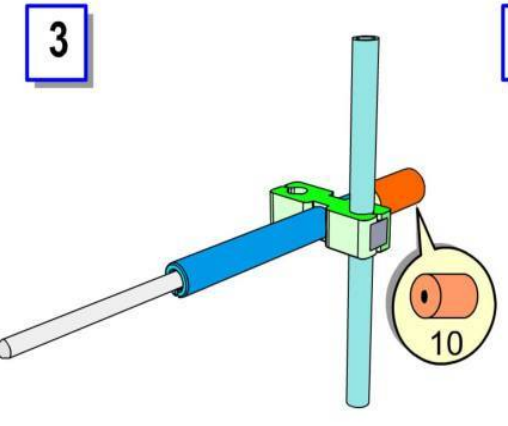
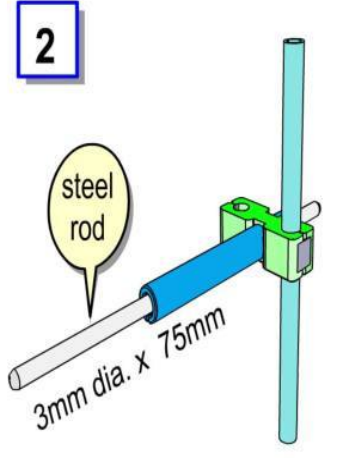
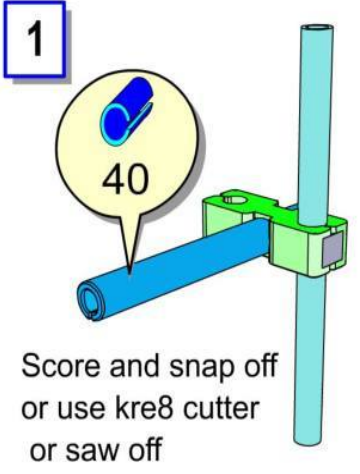


10



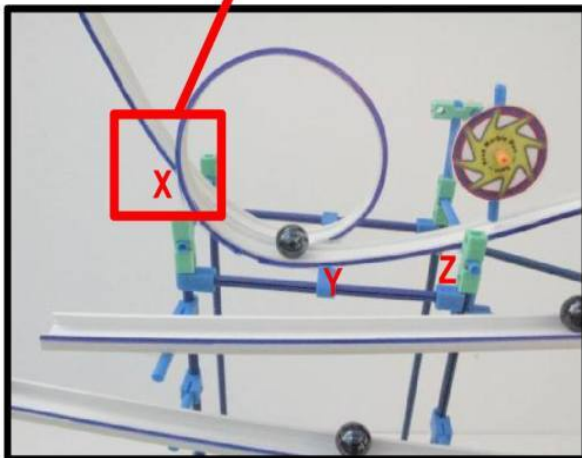
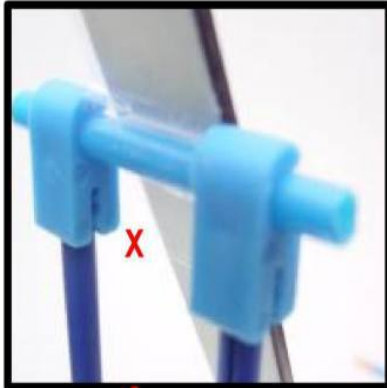
The parts sticking out are used to support the track - adjust as needed

Now ready to add marble track



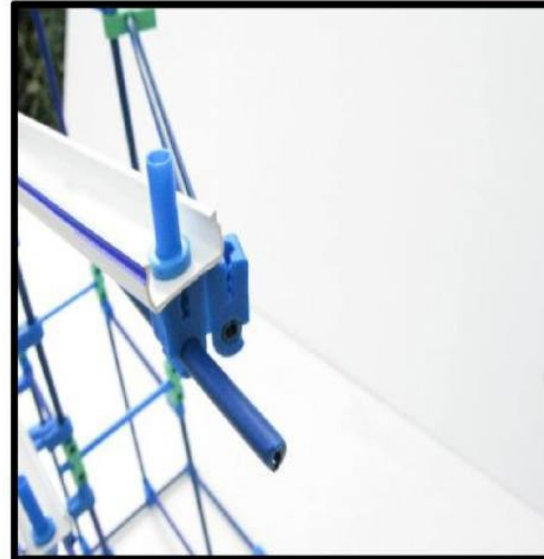
Use images from page 9 or laminated parts provided

Joining loop with clear tape
to top of frame



Make the LOOP shape by bending with fingers until it HOLDS the shape wanted. Fix with tape on top of frame at points marked **X, Y, Z**.

Marble track fixing using a hole

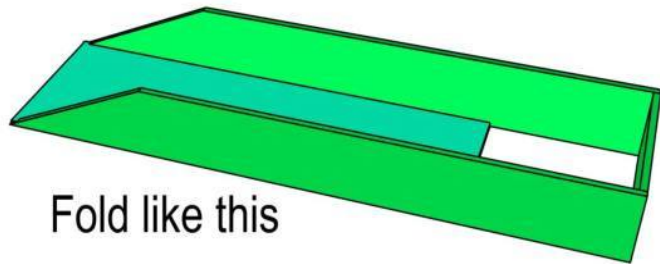
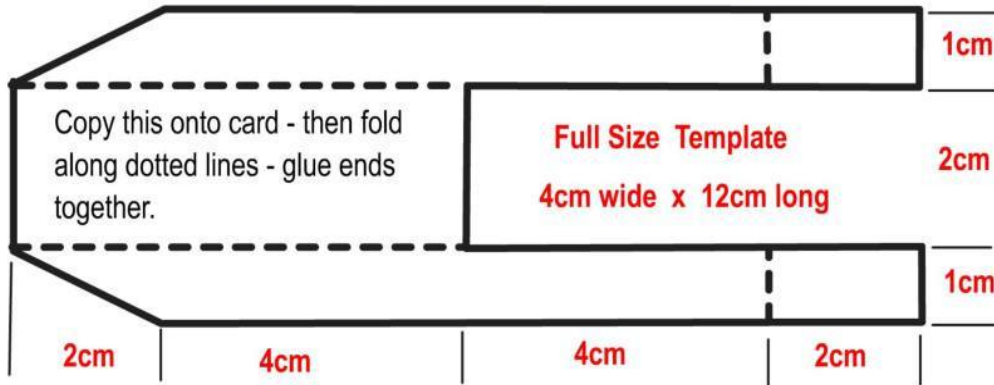


Ends of marble run tracks can have holes punched in at end or drilled 5mm diameter so rods can pass through



The tracks can be taped into place to the light blue tubes that they are resting on.

Marble 'stop and drop' making



Fold like this

Tape piece made to end of 'loop the loop' channel

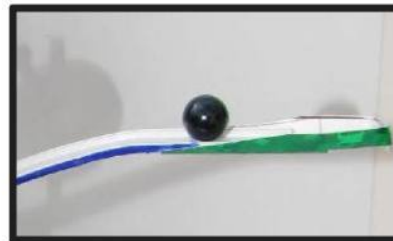
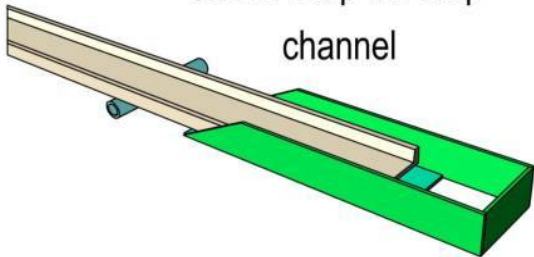
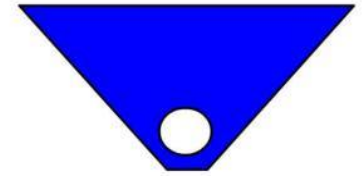
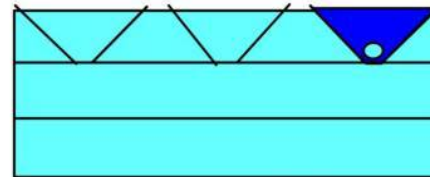


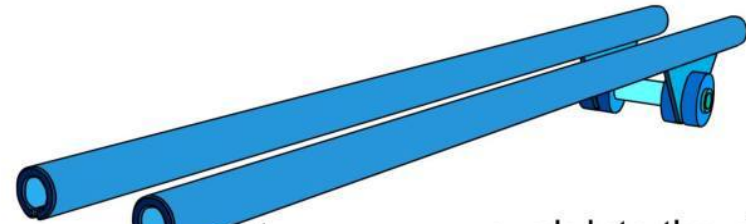
Photo showing marble about to roll into the 'stop and drop'

Adjustable width straight track idea

Cut out from blue plastic sheet



Making the Triangles



push into the slit rods

Cut from blue plastic sheet as shown above and punch hole

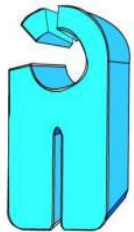
Photo showing some slit rods held using the triangle pieces



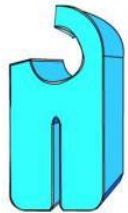
TWO modified clip connectors are needed if you want to support the curved marble run part (see drawing)

Note - Modified 'clip connectors' are also useful if you need to add clips onto the upright rods amongst lots of other clip connectors - avoiding need to remove the other parts first

To modify 'clip the end off' using thin 'side cutters' like that shown OR hold the 'clip connector' in a vice and saw vertically down.



cut this part off with side cutters
or a saw in a vice



after part is removed

After doing this check it can still hold on onto a blue slit rod

Marble track using 15mm wide red plastic strip

