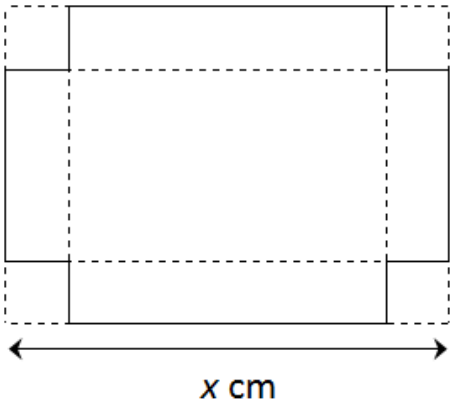
A Parabolic Investigation

Task: a rectangular sheet of card, with perimeter = 80 cm is made into an open-topped box, by folding in 2 cm x 2 cm squares from each corner. Investigate the relationship between x, the length of one side of the card and C, the capacity of the box.



1. First assemble the following sheets of card, allowing you to make and measure a range of boxes for this investigation.
   x = 6 cm
   x = 10 cm
   x = 14 cm
   x = 18 cm
   x = 22 cm
   x = 26 cm
   x = 30 cm
   x = 34 cm
   What do you notice about these rectangles?

2. Now make the boxes and measure their capacity (either by weight of dry rice the box can hold, or by measuring and calculating).

3. Graph capacity (or weight of rice held) against x. Describe the shape of this graph.

4. What is the maximum capacity of all the possible boxes?