

Unit title	Max Box
Topic	Investigation to find the maximum volume of a cuboid.
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Aims of Unit	To find the maximum volume of an open box given a square or rectangular piece of card.
Indicative content	Given a square piece of card – what is the maximum volume of an open box that can be formed by cutting squares from each corner? What if the card was a rectangle rather than a square?
Resources needed	Squared paper, rulers, pencils. Access to a computer spreadsheet may be appropriate for some students.
Teachers notes	<p>The following questions that can be posed to students.</p> <p>Is the length of the square cut from each corner related to the length of the side of the original square?</p> <p>What happens with a rectangular piece of card?</p> <p>Results may be presented graphically and compared to the result found using calculus.</p> <p>All Pupils should be able to calculate volume and describe the concept of cubed.</p> <p>Most Pupils will be able to cut and fold card to produce a shape.</p> <p>Some pupils will be able to predict the consequences of creating a rectangle or other shapes and justify their predictions verbally.</p>

Max Box

From a square piece of card with sides 38 cm, identical squares (of side x cm) are cut from each corner and an open box is formed by folding up the sides. Investigate how the volume of the open box varies as x varies. What is the value of x which gives a maximum volume?

Investigate with others sizes of card and extend to rectangular pieces of card.

