As outcomes, Year 8 pupils should, for example:	As outcomes, Year 9 pupils should, for example:

Use logical argument to establish the truth of a statement; give solutions to an appropriate degree of accuracy in the context of the problem.
For example, solve:

- Consecutive sums
  Prove that the sum of any five consecutive numbers is always divisible by 5.

  Related objectives:
  Represent problems in algebraic, geometric or graphical form.

  Link to multiples, factors and primes, and tests of divisibility (pages 52–5).

- Max box
  Open-top boxes can be made from paper by cutting identical squares from each corner and folding up the sides.
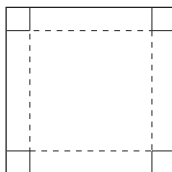
  Start with a 20 cm square.
  Plan to make an open-top box with the greatest possible capacity.
  What are its dimensions?

  Explore for other sizes of squares.

  Related objectives:
  Suggest extensions to problems, conjecture and generalise; identify exceptional cases or counter-examples.

  Link to ordering decimals (pages 40–1); constructing linear functions arising from real-life problems and plotting their graphs (pages 172–3); interpreting graphs arising from real situations (pages 174–7).

- Pizza
  These are the ingredients for a pizza for 4 people.

½ oz dried yeast	2 oz mushrooms
½ pint water	2 tomatoes
1 lb of plain flour	4 oz cheese
½ teaspoon of salt	6 black olives
8 oz ham	

  Adapt the recipe for 6 people.
  Convert the recipe to metric measurements.

  Related objectives:
  Solve problems in a range of contexts.

  Link to solving simple word problems involving ratio and direct proportion (pages 78–81); converting imperial to metric measures (pages 228–9).

Present a concise, reasoned argument, using symbols, diagrams, graphs and text; give solutions to an appropriate degree of accuracy; recognise limitations on accuracy of data and measurements; give reasons for choice of presentation, explaining features, showing insight into the problem's structure.
For example, solve:

- Perimeter
  The perimeter of a triangle is 48 cm. The length of the shortest side is s cm, and of another side is 2s cm. Prove that $12 > s > 8$.

  Related objectives:
  Represent problems in algebraic, geometric or graphical form.

  Link to solving problems using properties of triangles (pages 184–9).

- Round table
  At Winchester there is a large table known as the Round Table of King Arthur.

  The diameter of the table is 5.5 metres.
  A book claims that 50 people can sit around the table. Do you think this is possible?
  Explain and justify your answer.
  State all the assumptions that you make.

  Related objectives:
  Solve substantial problems by breaking them into simpler tasks, using efficient techniques, methods and resources, including ICT; use trial and improvement where a more efficient method is not obvious.

  Link to using circle formulae (pages 234–7).

- Seeing the wood for the trees
  Estimate the number of trees that are needed each day to provide newspapers for the UK.

  Related objectives:
  Solve increasingly demanding problems; explore connections in mathematics across a range of contexts.

  Link to discussing how data relate to the problem, identifying possible sources; identifying possible bias and planning to minimise it (pages 250–1); communicating results using selected tables, graphs and diagrams in support, using ICT as appropriate (pages 272–5); examining results critically, recognising the limitations of any assumptions and their effect on conclusions drawn (pages 272–5).