The National Strategies
Primary

# Securing level 5 in mathematics

department for
children, schools and families

# Securing level 5 in mathematics


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# Securing level 5 in mathematics

These materials are intended to support you in ensuring that as many children as possible reach level 5 by the end of Year 6. The guidance identifies key areas of learning that children need to secure to attain level 5 in mathematics. While you will integrate the ideas from these materials into your ongoing planning, you could also use them to plan targeted support for particular groups of children. There is a double-page spread for each of the six areas of mathematics:

- Securing mental and written methods of calculation
- Explaining patterns and reasoning
- Working with fractions, ratio and proportion
- Solving multi-step problems
- Using properties of shapes and angles
- Interpreting and comparing graphs and outcomes

**Remember**

**Every day is a mental mathematics day** – ensure that children engage in sustained mental work each day (at least 10–15 minutes) to secure and develop knowledge, skills and understanding in mathematics. *Don't expect confidence in working mentally if practice and repetition have not taken place.*

**Hands-on learning is still important** – provide access to practical equipment for children to use and manipulate, to help them to explore how and why things work and to learn to visualise, describe and represent what is in front of them. *Don't just talk about truncated cones, show one; using apparatus is better than imagining what it looks like.*

**Seeing mathematics through models and images supports learning** – help children to see how mathematics works and can be represented with a physical object, picture or diagram such as enlargements showing scaling up and down, altering data on pie charts or representations of ratios and proportions. *Don't expect children to visualise and 'see' how something works if they have no models and images to draw from.*

**Talking mathematics clarifies and refines thinking** – give children the vocabulary and language of mathematics; provide activities and time for them to use this language to discuss mathematics. Teach children the precision of language, for example, using: equivalent, similar, scale factor and how to express their reasoning, using language such as if …then, because, cannot be, never, sometimes, always. *Don't expect children to explain or provide reasons if they have no opportunity to use, develop and refine the language to do so.*

**Make mathematics interesting** – share your interest in mathematics with the children. Give children mathematics that engages them in: estimating ratios and proportions; finding out about the outbreak of an epidemic; testing out ideas such as whether the sum of three adjacent vertical numbers on a grid with 7 columns is always divisible by 3; answering intriguing questions such as whether the diagonals of a parallelogram intersect at right angles. *Don't expect children to be interested in mathematics if you don't share an interest and all their mathematics is routine and dull.*

**Learning from mistakes should build up children's confidence** – look out for mistakes and encourage children to recognise that making mistakes is something everyone does. Show children common errors and get them to identify and correct them. Encourage children to work with a partner and share their work. *Don't just tell children something is wrong; help them to see what went right and to identify when it went wrong.*


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# Securing mental and written methods of calculation

**Level 5 standards to be achieved:**

| |
|---|
| Multiply and divide whole numbers and decimals by 10, 100 and 1000 |
| Use understanding of place value to multiply and divide whole numbers and decimals, including three-digit by two-digit calculations |
| Use all four operations with whole numbers and decimals |
| Make effective choices about which calculation method to use, based on the numbers involved |
| Add and subtract negative numbers in context |
| Understand and use brackets appropriately |
| Calculate fractions and percentages of quantities or measures |

**For children to attain level 5, they need to:**

- understand decimal numbers and the effect of multiplying and dividing these by powers of ten
- use known facts to derive related facts, for example, use $8 \times 7$ to give the answer to $0.08 \times 7$ or $80 \times 70$
- add and subtract numbers with a different number of decimal places, for example, $19.1 - 13.42$
- have efficient written methods for all four operations, where they understand each step, and use approximation to check that the answer to a written method is about the right size
- add and subtract negative numbers in contexts such as height above sea level
- appreciate that, in an equation, a calculation inside brackets must be worked out first
- find the appropriate unit fraction of a quantity, using division, then multiply their answer to find a non-unit fraction, such as $\frac{3}{5}$
- understand how to use key percentages, such as 10%, of a quantity to find other percentages

**Make sure that:**

| |
|---|
| children understand the use of zero as a place-holder in decimal numbers such as 0.07 and appreciate where zeros are not necessary, for example, the zero at the end of 1.30 |
| children have regular opportunities throughout the mathematics lesson to calculate mentally, using jottings where necessary, for example, number lines to work with negative numbers |
| children understand and can use accurately expanded methods for written calculation (such as the grid method for multiplication) that supports the teaching of more efficient and compact methods |
| children have frequent opportunities to explain their choice of calculation method, compare methods with others and discuss the efficiency of different methods |
| children check their answers to written calculations, using approximation or inverses |
| children explain steps involved in finding fractions and percentages of quantities, for example, finding 15% of £460 by finding 10%, halving it to find 5% then adding the two parts |
| children apply calculation skills to solve increasingly complex multi-step problems |

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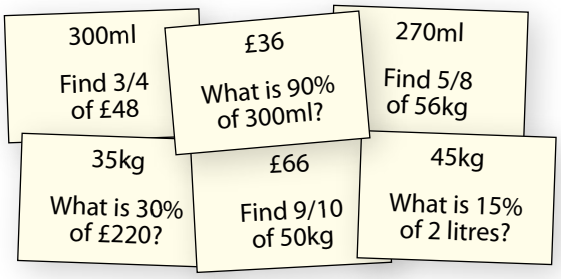
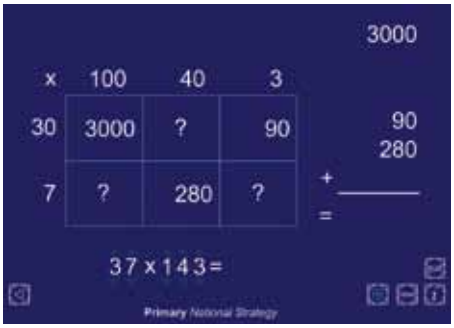
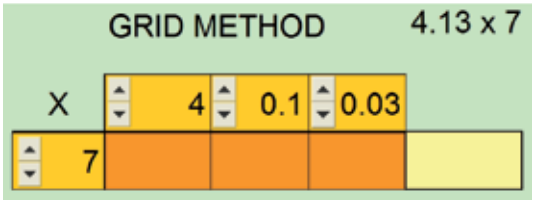
## Teaching and learning resources

Follow-me cards



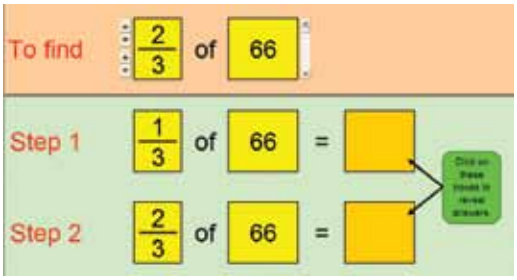




Multiplication grid ITP




Decimal grid method spreadsheet


Decimal place value cards




Fractions of amounts spreadsheet

## Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can multiply and divide whole numbers and decimals by 10, 100 or 1000* | I divided a number by 100. The answer was 24.8. What was my number?<br>A pack containing 1000 sheets of paper is 9.8cm thick. What is the approximate thickness of one sheet?<br>Explain how you can use the fact $7 \times 8 = 56$ to find the answer to $5.6 \times 0.8$. |
| *I can calculate with whole numbers and decimals, using mental and written methods as appropriate* | Make up an example of an addition or subtraction, involving decimals, that you would do in your head. Now make up an example you would do on paper. Explain the reasons for using these two methods.<br>Kim knows that $137 \times 28 = 3836$. Explain how she can use this information to work out the multiplications: $138 \times 28$; $137 \times 27$<br>KS2 1997 Paper A level 5 © QCA<br>Work out the missing digit: $\square 92 \div 14 = 28$<br>Shenaz buys a pack of 24 cans of cola for £6. What is the cost of each can?<br>KS2 1998 Paper A level 5 © QCA<br>Work out: $100 - 3 \times 22.5$ |
| *I can find fractions and percentages of numbers and quantities* | Explain how you would find 35% of £60, without using a calculator.<br>John says: 'I think three eighths of a day is 10 hours.' Is he right?<br>Work out which is larger: $\frac{3}{5}$ of 480kg or $\frac{7}{8}$ of 320kg.<br>Write in the missing numbers: 40% of 80 is $\square$ 40% of $\square$ is 80 |
| *I can add and subtract negative numbers* | At the north pole the temperature is –25°C. At the equator the temperature is 77 degrees higher. What is the temperature at the equator? |

# Explaining patterns and reasoning

**Level 5 standards to be achieved:**

| |
|---|
| Describe situations and problems mathematically, using symbols, words and diagrams |
| Organise work, looking for ways to record precisely and systematically |
| Identify and explain patterns and use them to predict and hypothesise |
| Make generalisations in words and using symbolic notation |
| Investigate general statements by trying out different examples |
| Draw conclusions, explaining reasoning orally and in writing |
| Construct and use simple formulae involving one or two operations |

**For children to attain level 5, they need to:**

- describe a situation or problem in their own words before using a diagram to represent it, or translating it into calculations or equations to be solved
- use accurate and precise mathematical language, including that associated with reasoning, for example, predict, hypothesis, test, sometimes true, always true, demonstrate and prove
- describe patterns in number sequences and predict numbers that will or will not fall within the sequence, for example, those in the third column of a number grid with eight columns
- use patterns in simple number sequences to predict, for example, the tenth term without needing to list all of the previous terms
- test general statements, using different examples, but appreciate that finding lots of examples for which a statement holds true is not enough to prove that it is true for all cases
- identify shared features of examples that satisfy a general statement, to begin to explain why it will always be true
- construct and use simple formulae involving one or two operations, for example, the cost of **s** ice creams at **75** pence each is **75s** pence

**Make sure that:**

| |
|---|
| children have regular opportunities to explain their thinking orally and in writing, encouraging them to redraft written explanations to increase clarity |
| children compare solutions to problems, discussing different representations to see which is most effective and sharing alternative explanations and reasoning |
| children discuss 'always/sometimes/never' statements, such as *all multiples of 6 are also multiples of 3* or *all prime numbers are odd*, and justify their decisions |
| you discuss how to use numbers, diagrams and symbols, in addition to words, when writing a reasoned explanation to make recording more concise |
| you model the language of reasoning, for example, suggesting how to word a general statement |
| you teach children how to use counter-examples to disprove a hypothesis such as *all factors of 20 are even* |

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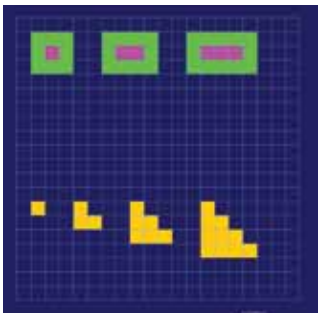
# Teaching and learning resources

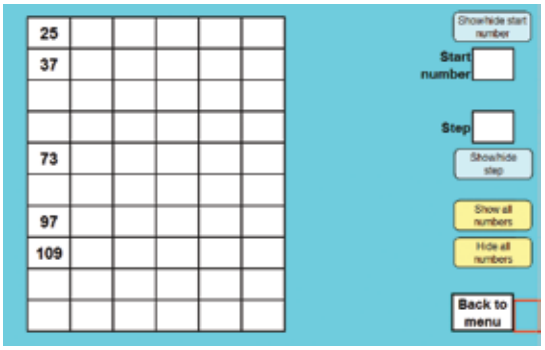


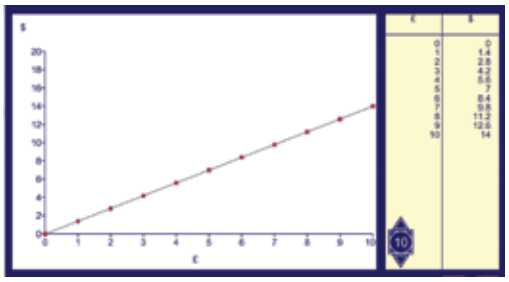
Area ITP

Tables

| No. of tickets | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Price | £24 | £48 | £72 | £96 | £120 | £144 | £168 | £192 | £216 |

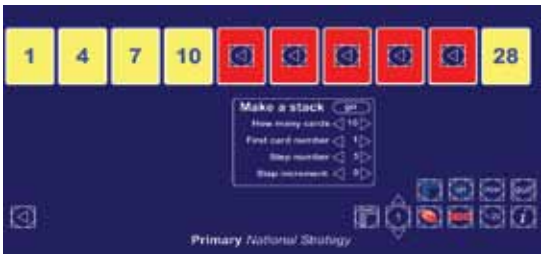
Decreasing and increasing number grid spreadsheets



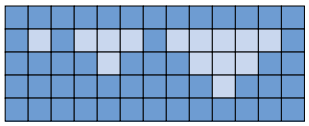



Line graph ITP

20 cards ITP




# Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can describe a problem and identify the mathematics I need to use to solve it* | There are three airports on an island. Every day one plane flies from each airport to each of the other airports. Use a diagram to make sense of the problem. How many flights are there each day?<br>What if there were 4 airports, 5 airports...? |
| *I can explain my mathematical thinking clearly and systematically, using words, diagrams, numbers and symbols* | $p$ and $q$ each stand for whole numbers. $p + q = 1000$ and $p$ is 150 greater than $q$. Calculate the values of $p$ and $q$. KS2 2001 Paper B level 5 © QCA<br>Solve this problem, recording your thinking. Explain your method to a friend.<br>Peter says that when you remove one square from the area of a shape, its perimeter will get smaller. Is this true, sometimes, always or never? Justify your answer. |
| *I can identify and describe patterns and use them to make predictions and general statements* | Describe the third shape to a friend, using words. Now describe the sequence. Explain how the sequence increases in size. How many squares are there in each picture?<br>  <br>Predict and check how many squares will be in the next picture. Use what you have found to suggest how many small squares would be in the 10th picture? 100th? *n*th? |
| *I can write and use simple expressions in words and formulae* | Write a formula for the 10th, 100th, nth term of the sequence: 3, 6, 9, 12, 15...<br>One bottle holds 5 glassfuls. How many glassfuls in 2 bottles, 20 bottles, $x$ bottles? Write a formula showing the relationship between the number of glassfuls $g$ and the number of bottles $b$.<br>$y$ stands for a number. Complete this table:<br>Now make up your own tables, using letters to describe the relationships between the numbers in the columns. |

| y | 3y | 3y + 1 |
|---|---|---|
| 25 | | |
| | | 28 |

# Working with fractions, ratio and proportion

**Level 5 standards to be achieved:**

| |
|---|
| Understand and use the language of ratio and proportion |
| Solve simple problems involving ratio and proportion |
| Solve problems that involve calculating fractions and percentages |
| Recognise and find equivalent fractions, decimals and percentages |
| Reduce fractions and ratios to their simplest form |

**For children to attain level 5, they need to:**

- interpret and describe ratio, using vocabulary such as *to every, for every*, scale and understand the use of the colon in ratio notation such as *1 : 5*
- interpret and describe proportion, using vocabulary such as *in every, parts of the whole,* including the language of fractions and percentages such as *two-fifths of, 40 per cent of*
- use understanding of scaling up or down to solve problems involving ratio and proportions, for example, if 100g of rabbit food costs 70p then 200g would cost £1.40, and 50g would cost £0.35; if a 10-metre length of pipe holds 240cl of water a 3-metre length of the same pipe holds 72cl
- be able to describe one amount as a fraction or percentage of another, for example, recognising that 20p is $\frac{20}{200}$ or $\frac{1}{10}$ or 10% of £2
- understand equivalence and convert between fractions, decimals and percentages; use a calculator to find the decimal equivalent of a fraction , for example, find $\frac{3}{20} = 0.15$ by working out $3 \div 20$
- compare fractions by converting them into equivalent fractions with the same denominator or into decimals
- understand and interpret mixed numbers, for example, $2\frac{1}{3}$ and improper fractions $\frac{8}{3}$
- express a remainder as a fraction where appropriate $11 \div 4 = 2\frac{3}{4}$

**Make sure that:**

| |
|---|
| you encourage children to draw diagrams and make jottings to help solve problems involving fractions, ratio and proportion |
| you give children opportunities to describe the relationships between two quantities, using the language of ratio and proportion |
| children explain and compare methods for solving problems involving fractions, ratio and proportion |
| children know that if they multiply or divide the numerator and denominator of a fraction by the same number this will produce an equivalent fraction |
| children use their knowledge of common factors to help them reduce fractions and ratios to their simplest forms |
| children understand the link between division, proportion and fractions recognising, for example, that *3 ÷ 5* and *3 out of 5* can both be described by the fraction $\frac{3}{5}$ |

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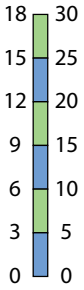
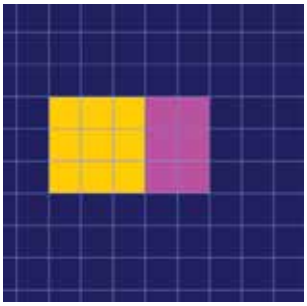
# Teaching and learning resources

| Ingredients | For 3 people | For 8 people | For 2 people |
|---|---|---|---|
| Butter | | 200g | |
| Milk | 120ml | | |
| Flour | | | 80g |
| Raisins | | 40g | |
| Cherries | 75g | | |

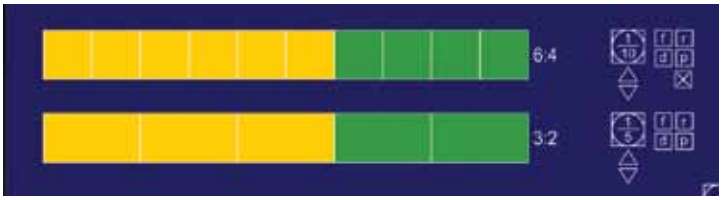
Tables



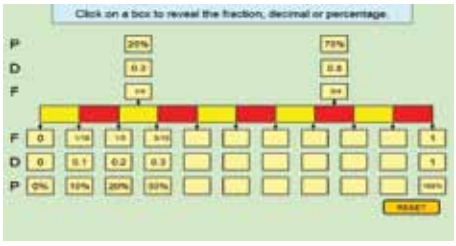

Area ITP, tiles or squared paper



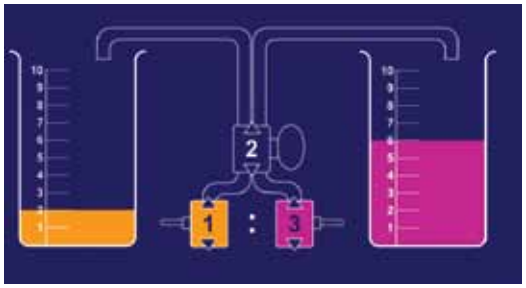
Counting stick




Fractions ITP

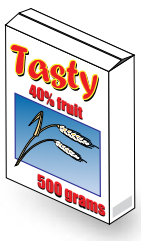


Fractions spreadsheet



Ratio and proportion ITP

# Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can solve problems using ratio and proportion and use mathematical language to describe my method* | A recipe for 4 people requires 200g of butter. How much butter would you need for 2 people? 6 people? 5 people? Explain how you found the quantities of butter that were needed.<br>Sapna makes a fruit salad, using bananas, oranges and apples. For every one banana, she uses 2 oranges and 3 apples. Sapna uses 24 items of fruit. How many oranges does she use? KS2 2005 Paper B level 5 © QCA |
| *I can solve problems involving fractions and percentages* | What fraction of 8 is 2? What fraction of 8 is 12? What fraction of 80 are 20, 100 and 120?<br>Tell me two quantities such that one is 25% of the other. Now give me two quantities such that one is 5% of the other. What about 40%? |
| *I can simplify fractions and ratios* | Write $\frac{18}{24}$ in its simplest form. What did you do to simplify this fraction? What clues do you look for to reduce fractions to their simplest form? How do you know when you have the simplest form of a fraction?<br>The ratio of fruit to cereal in a packet of Tasty is 40 : 60. Write this ratio in its simplest form. Y7 optional test Paper A level 5 © QCA The manufacturer wants to reduce the ratio of fruit to 35 : 65, simplify this ratio.<br>  |
| *I can find equivalent fractions, decimals and percentages* | Would you rather have $\frac{3}{4}$ or $\frac{5}{6}$ of the same bar of chocolate? Explain your choice.<br>Which of these represent equivalent amounts?<br>0.4 $\frac{1}{3}$ 60% $\frac{3}{4}$ 0.2 90% 40% 0.3 $\frac{3}{5}$ 0.75 0.6 0.25 0.4 0.9 |

# Solving multi-step problems

**Level 5 standards to be achieved:**

| |
|---|
| Solve multi-step problems identifying the steps needed to find the solution |
| Choose and use the appropriate equipment and mathematics to solve a problem |
| Try alternative approaches to overcome any difficulties encountered |
| Check results, deciding whether they are sensible |
| Present, compare and review solutions |

**For children to attain level 5, they need to:**

- solve multi-step problems in a range of contexts, including money, measures, time, shape and data-handling
- solve problems that involve fractions, decimals, percentages, ratio and proportion
- solve problems that involve the use of inverse operations, such as *I think of a number...* problems
- identify and obtain the necessary information required to solve the problem and determine if there is any important information missing
- carry out calculations accurately using mental, written and calculator methods, choosing those most appropriate to the problem
- communicate clearly, both orally and in writing, using diagrams and symbols where appropriate and explaining or recording each step of the problem

**Make sure that:**

| |
|---|
| children regularly discuss their choice of strategy, calculation methods and recording and have opportunities to develop and refine their thinking |
| children recognise situations in which a calculator is a useful calculation tool and can use one with confidence, for example, working backwards from a displayed answer |
| children use a range of recording formats, including diagrams, calculations, symbols, tables... recognising what is most appropriate and why |
| you encourage children to reread the problem to make sure that their answer is sensible in the context of the question being asked |
| children convert between units of measure to help with a calculation, giving answers in a suitable unit and to a suitable degree of accuracy |
| children evaluate each other's solutions, give positive feedback and suggest refinements |
| you teach children to check solutions routinely, using inverses or approximations |

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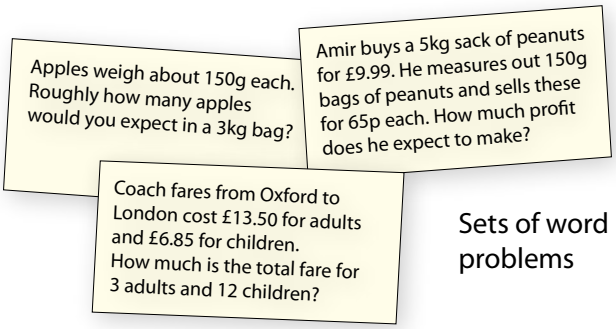
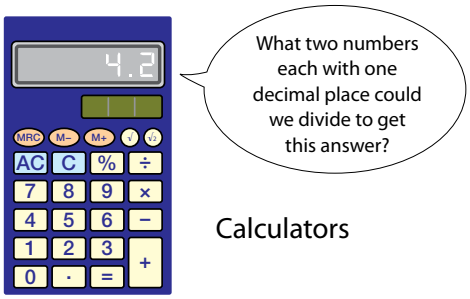
# Teaching and learning resources

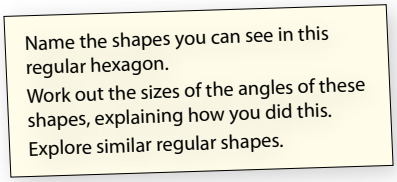



Sets of word problems




Calculators

Isometric grid ITP


Exploration cards

# Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can solve problems involving more than one step, identifying the appropriate operation for each step* | Every 100g of brown bread contains 6g of fibre.<br><br>A loaf of bread weighs 800g and has 20 equal slices. How much fibre is there in one slice?<br>KS2 2004 Paper B level 5 © QCA<br><br>  <br><br>How many 250 ml cups of tea can you pour from a tea urn that holds 8.5 litres?<br><br>50 000 people visited a theme park in one year. 15% of the people visited in April and 40% of the people visited in August.<br>How many people visited the park in the rest of the year?<br><br>Work out: $4 + 4 \div 4 + 4$ and $5 - 2 \times 3 + 4$. Does your calculator give the same answers as your answers? |
| *I can check that my answer to a problem sounds sensible* | Steph wants to cut 4.55m of ribbon into 25cm strips. She wants to know if she had enough ribbon for 24 strips. She used a calculator to divide 4.55 by 24 and got an answer of 0.1895833. How could she use this calculation to help her decide if she had enough ribbon?<br><br>If an isosceles triangle has one angle of 50°, what are the other two angles? Sam joins together two of these triangles to form a quadrilateral. He says he has a rhombus with an angle of 100°. Is he right? |
| *I can present my solutions to a problem clearly, both orally and in writing* | The area of a rectangle is 24cm$^2$. One of the sides is 3cm long. What is the perimeter of the rectangle? If another rectangle with the same area had a side of 4cm would the perimeter be bigger too? Explain your thinking and record how you worked out the answer to this problem.<br><br>I think of a number. I find $\frac{1}{3}$ of it then add 60. My answer is 85. What number did I think of? Explain how you can solve this problem. Make up and solve and share similar problems. |

# Using properties of shapes and angles

**Level 5 standards to be achieved:**

| |
|---|
| Recognise and use properties of 2-D and 3-D shapes including their symmetries |
| Use mathematical language to describe shapes and their properties |
| Make shapes, including through using ICT, that meet given properties |
| Measure and draw angles to the nearest degree, use language associated with angle |
| Know and use the angle sum of a triangle and the angle sum at a point |
| Use and interpret coordinates in all four quadrants |

**For children to attain level 5, they need to:**

- explore the properties of triangles, quadrilaterals and other polygons and use this knowledge to identify similarities and differences between shapes
- recognise parallel and perpendicular edges or faces in 2-D and 3-D shapes
- draw shapes to satisfy criteria, including symmetrical properties, for example, on an isometric grid draw hexagons with three angles of 60°, on a square grid draw a shape with one line of symmetry with given coordinates
- extend their reasoning to test, explore and explain properties of shapes such as why and when the diagonals of quadrilaterals bisect each other
- solve shape problems, for example, find all possible side lengths for an isosceles triangle with a perimeter of 22cm and one side of 8cm
- use knowledge of angle properties to solve problems, for example, to find the internal angle of a regular octagon

**Make sure that:**

| |
|---|
| children explore properties of shapes, such as those shapes formed by joining together any pair of identical isosceles triangles |
| children generate shapes using grids, common resources and ICT, to test ideas |
| children classify shapes, using criteria, for example, edges are parallel or faces are perpendicular |
| children explore 'always/sometimes/never' statements such as *the diagonals of quadrilaterals are perpendicular; a square is a rhombus; hexagons have 9 diagonals* |
| children are encouraged to annotate diagrams and draw their own to solve problems |
| you help children to visualise shapes, describe what they 'see' and draw them on grids |
| children identify the angles they know or can work out quickly in diagrams, in order to help them find other missing angles |
| children apply knowledge of shapes and coordinates to identify missing information, for example, the coordinate of the 4th vertex of the rectangle with vertices at (–3, –1), (–1, –2), (1, 2) |

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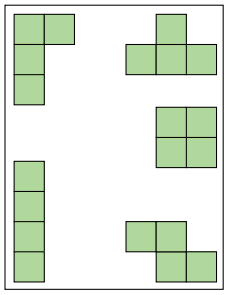
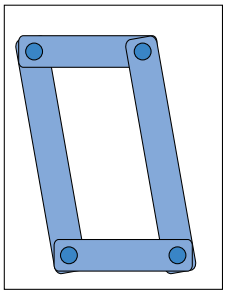
## Teaching and learning resources

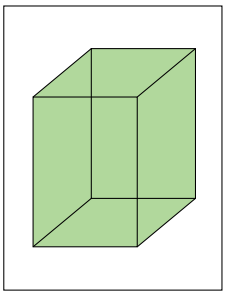
Shape tiles



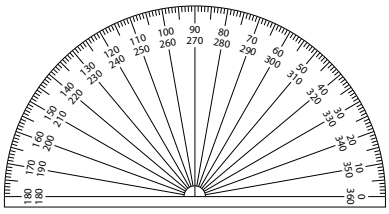
Sticks or geostrips

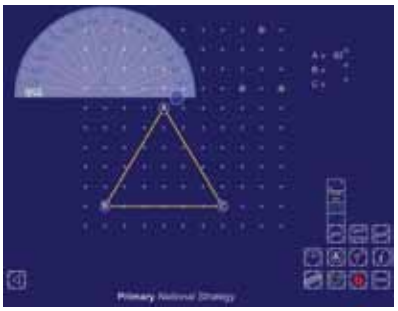


Art straws or construction kits

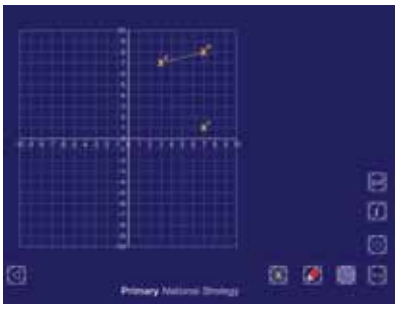


Protractor





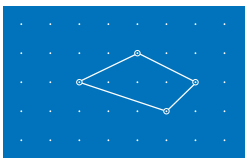
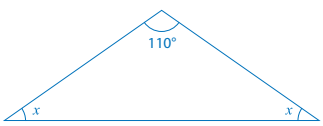
Fixpoints ITP



Coordinates ITP

Isometric grid ITP

## Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can describe 2-D and 3-D shapes, using accurate mathematical vocabulary* | Visualise a hexagonal prism. How many faces does it have?<br>What shape are they? Are any of the faces parallel to each other?<br>Visualise two identical equilateral triangles placed side-by-side so that the edge of one matches exactly to the edge of the other. Describe the shape that they make together. |
| *I can use my knowledge of shape properties to solve problems* | Describe how you could change this shape into a kite by moving one point. What about a rhombus? A non-isosceles trapezium?<br>Use the ICT to try out your ideas.<br>  |
| *I can use knowledge of angle facts to work out angles in shapes and diagrams* | What is the angle between the hands of a clock at four o'clock? Explain how you know.<br>Look at this diagram of an isosceles triangle. Calculate the size of angle x. Do not use a protractor (angle measurer).<br>  <br>KS2 2002 Paper A level 5 © QCA |
| *I can use and answer questions about coordinates in all four quadrants* | Draw the shape with the coordinates (–5, 1) (–4, –1) (–5, –4) (–6, –1).<br>Describe the properties of this shape. Can you create the same shape in a position where all of the coordinates will be positive? |

# Interpreting and comparing graphs and outcomes

**Level 5 standards to be achieved:**

| |
|---|
| Create and interpret line graphs in which the intermediate values have meaning |
| Interpret pie charts and other graphs and diagrams and draw conclusions |
| Compare two simple distributions, using the range, mode, median or mean, and explain what these tell you about a set of data |
| Draw conclusions from analysis of data and identify further questions to ask |
| Understand that different outcomes may result from repeating an experiment |
| Use the probability scale 0 to 1 and find and justify probabilities based on equally likely outcomes |

**For children to attain level 5, they need to:**

- read data accurately from graphs and charts, including making reasoned estimates for data falling between labelled divisions
- understand when and how line graphs show the relationship between two measures and interpret these graphs, for example, those that show how one measure changes over time
- interpret and compare pie charts where it is not necessary to measure angles, for example, comparing two pie charts that represent two different groups
- identify possible outcomes from an experiment, recognising if they are equally likely
- interpret the probability on the 0 to 1 scale and find probabilities where there are equally likely outcomes, for example, getting an even number on a regular hexagonal spinner

**Make sure that:**

| |
|---|
| children are given the opportunity to create their own graphs where they choose the scale, both in mathematics and across the curriculum, including conversion graphs |
| children use labelled measurements to work out the value of each interval on the axis |
| children analyse graphs and charts in groups, discuss what they show and the sorts of questions that could be asked and answered from the data represented |
| you discuss with children how different representations display different types of data effectively, for example, how the area of the circle in a pie chart provides a visual model for the proportion of data falling into different categories |
| children use ICT to create and compare graphs, including exploring the effect of different scales |
| children investigate relevant data-handling questions, draw conclusions and report them, justifying their choice of data representations to illustrate their report |
| children explore averages for simple sets of data, discussing which might be the most appropriate to use in different circumstances |
| children carry out experiments that involve outcomes that are equally likely and outcomes that are not equally likely, discuss and compare results |

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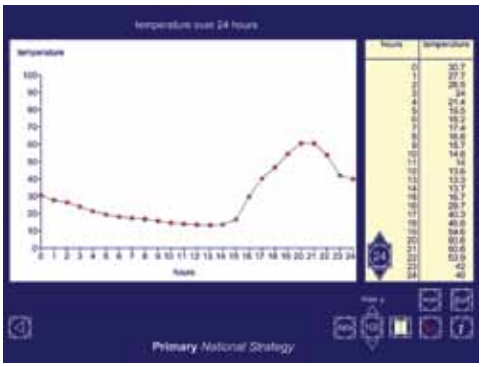
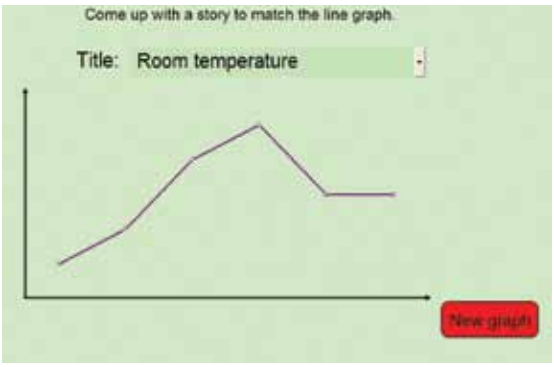
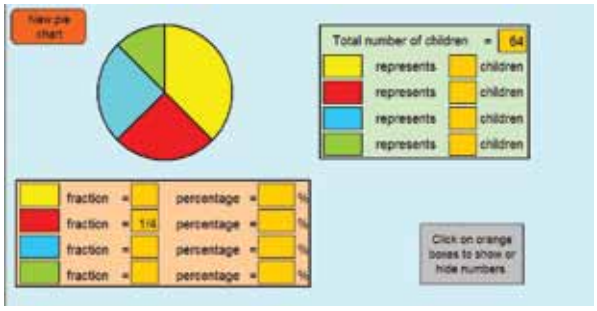
## Teaching and learning resources



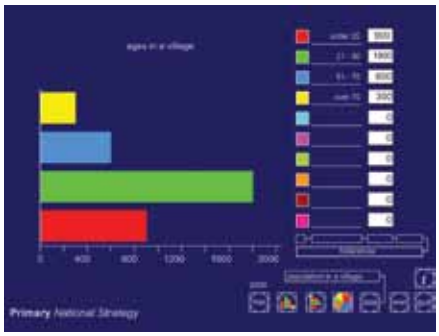
Line graph ITP




Flexible line graph spreadsheet

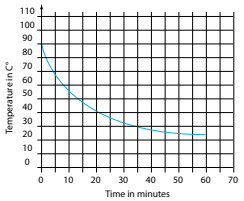
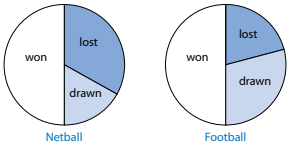
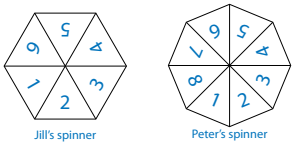



Pie chart spreadsheet



Data handling ITP

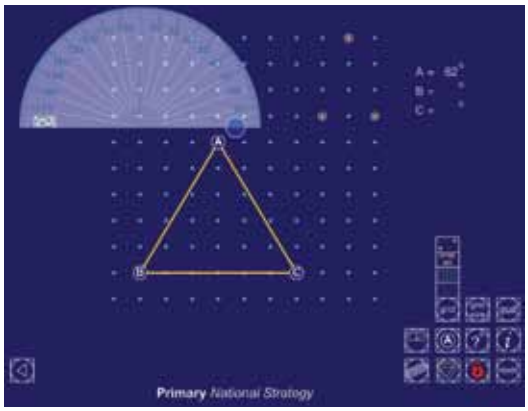
## Assessment checklist

| 'I can' statement | Assessment examples |
|---|---|
| *I can create line graphs and use them to answer questions* | In a science experiment, a hot liquid is left to cool. This graph shows how the temperature of the liquid changes as it cools. Read from the graph how many minutes it takes for the temperature to reach 40°C and for how many minutes the temperature is above 60°C. KS2 2001 Paper B level 5 © QCA   |
| *I can interpret data in graphs and charts and use this to answer questions and draw conclusions* | The pie charts show the results of a school's netball and football matches. The netball team played 30 games. The football team played 24 games. Estimate the percentage of games that the netball team lost. David says: 'The two teams won the same number of games.' Is he correct? Explain how you know. KS2 2003 Paper A level 5 © QCA   |
| *I can explain why events are equally likely and use this to find the probability of outcomes* | Here are two spinners. Jill says: 'I am more likely than Peter to spin a 3.' Is Jill correct? Explain your reasoning. Peter says: 'We are both equally likely to spin an even number.' Is Peter correct? Explain your reasoning.   |
| *I can use the range, mode, median or mean to compare two sets of data and explain what they tell me* | A group of children take the same spelling test twice, once in January and again a month later. Their scores in January are: 16, 13, 18, 13, 12, 16, 17 and in February they are 15, 13, 20, 12, 20, 20, 12. How would you describe the group's progress in spelling from January to February? Justify your answer making reference to the range, median, mean and mode. KS2 1996 Paper A level 5 © QCA |

# Where can I find the resources?

## ICT resources

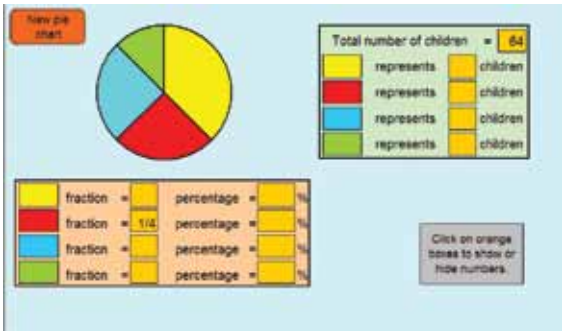
### ITPs (Interactive teaching programs)




Fixpoints ITP

These programs can be downloaded from **www.standards.dcsf.gov.uk/nationalstrategies/primary**. Navigate to the Mathematics Framework area and then to the Mathematics resource library. Refine the results by filtering down to the interactive teaching programs.

### Spreadsheets




Pie chart spreadsheet

These programs can be downloaded from **www.standards.dcsf.gov.uk/nationalstrategies/primary**. Search for spreadsheets and refine your search to display those relevant to Key Stage 2.

### Intervention materials

**Overcoming barriers in mathematics – helping children move from level 4 to level 5**
This is a booklet with a set of materials, based on a CD-ROM, designed to help teachers move children from level 4 into level 5. The materials can be ordered from the National Strategies site: **www.nationalstrategies.standards.dcsf.gov.uk.**

# Acknowledgements

Questions from various QCA national test papers mathematics KS2 1996-2005.
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QCA test questions and mark schemes can be found at **www.testbase.co.uk**

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