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| **Objectives:** Find the area of triangles and parallelograms, beginning to use formulae; Find areas and perimeters of rectilinear shapes; Recognise that shapes with the same areas can have different perimeters and vice versa; Find volumes of cubes and cuboids. | | | | | | | | | | | | |
|  | **Starters** | Whole class teaching | | | | | | | **Guided group and independent paired/indiv practice activities** | | | **Plenary** |
| Monday 14th February | **Area of rectangles**  Ask chn to draw a 6cm by 4cm rectangle on cm2 paper. *How can we find the area?* Remind chn that we can count the squares or multiply the length by the breadth and the answer will be in square cm. Agree the area as 24cm2. Chn roll a 0 to 9 dice twice (roll again if roll 0 to 9) to give length and breadth of a rectangle. They sketch the rectangle on plain paper and calculate the area of each. How many areas can they find in 5 minutes? | | | | LO: To find the area of triangles  Use Hamilton PPT slides 6-10.  Use paper shapes to demo | | Whole class practice  Chn find the area of triangles (***see resources Area of triangles sheet 2***) and a compound shape made from triangles and a rectangle.  Easier: The triangles are drawn on cm2 paper (***see resources Area of triangles sheet 2***).  Expected plus  Ask chn to generalise how we can find the area of a right-angled triangle. Draw out that the area is ½ × length of the base × the height, ½bh for short. They check to prove this by drawing triangles in their books and finding the area, then any triangle that they draw on cm2 paper.  GUIDED: Harder Ask chn to generalise how we can find the area of a right-angled triangle. Draw out that the area is ½ × length of the base × the height, ½bh for short. They check to see if this works for the isosceles triangle on the sheet, and then any triangle that they draw on cm2 paper.  Ext: **CGP** **KS2 Maths SATs question bk p63.** | | | | | Ask chn from the Guided group to share the formula for find the area of a right-angled triangle, and explain how this relates to the area of the rectangle which can be drawn around it. |
| Tuesday 15th February | **Complete Maths Revision Morning Starter Powerpoint**  **Weekly powerpoint Week 2.**    **Slide 6** | | LO: To revise finding areas and perimeters of rectilinear shapes; recognise that shapes with the same areas can have different perimeters and vice versa.  **Hamilton PPT slides 17 – 24**  OR  Use *Perimeter and area,* **ppt compound shapes area and perimeter demonstrations.**  Cut out shapes to demo | | | Dev Area of compound shapes 1 star sheet (Q1-6). Children then work out the perimeter of the shapes on the sheet and record in their books.  **Extn**: Chn find different perimeters of a rectangle (whole number of cm for each side) for a given area of 36cm2.  Expected  Area of compound shapes 2 star sheet (Q1-6). Children then work out the perimeter of the shapes on the sheet and record in their books.  **Extn:** Chn find the maximum and minimum perimeter of a **rectangle** (whole number of cm for each side) for a given area of 36cm2.  **Ext**: They then find the maximum and minimum area of **rectangle** shapes with a perimeter of 36cm.  Embedded Embedded+  Mastery Twinkl Area and Perimeter questions 1 and 2 (including decimal values)  Chn find the maximum and minimum perimeter of a **rectilinear** (whole number of cm for each side) for a given area of 36cm2.  They find the maximum and minimum area of **rectilinear** shapes with a perimeter of 36cm. | | | | | Chn feedback the maximum and minimum perimeters of rectangles (74cm and 24cm). Write the following: 12m2, 12cm2, 12mm2, 12km2. Which of these could be the area of a bedroom floor? The area of a village? The surface area of a little finger nail? One side of a credit card? | |
| Wednesday 16th February | **Perimeters of rectangles**  Chn roll a 0 to 9 dice twice (roll again if roll 0 to 9) to give length and breadth of a rectangle. They sketch the rectangle on plain paper and calculate the perimeter of each. How many perimeters can they find in 5 minutes? | | | LO: To find volumes of cubes and cuboids.  Show children a cuboid e.g. dienes or rubik’s cube. Chn discuss in pairs how many cubes are in the cuboid. *How many are in the bottom layer? And how many layers? So how many altogether?* Explain that we can use a formula to describe this efficiently –length x width × height, or l ×w × h for short. Remind chn that that we measure volume in centimetres cubed (cm3) or metres cubed (m3) or millimetres cubed (mm3) or even kilometres cubed (km3) if the volume is really huge! *Each of these cubes is cm3, so the volume, the amount of space taken up by the shape is 60cm3.* Sketch a 7 by 4 by 5 cuboid on the board, labelling each side in metres. Chn calculate the volume in m3. | | | | GUIDED: Dev  Give each pair a copy of cuboids drawn so that the cubes can be seen on some surfaces (*see* ***resources find volumes of cubes E*).** They first agree how many cubes are in the bottom layer, then multiply by the numbers of layers to find the volume. If chn find it difficult to imagine the cuboids, make a few of them using cm3 cubes. Multilink as a resource.  **Extn**: Hamilton sheet H  Exp  Chn practise to find the volume of cubes and cuboids, then find a missing side given two sides and the volume (*see* ***resources find volumes of cubes H*)**. They sketch their own cuboids with a volume of 36cm3.  Embedded Embedded+:  Challenge children to find all the cuboids that can be made from 3 different prime numbers less than 15. They should check that the length of each side does not have another other factors other than itself and one, i.e. that it is prime.  Encourage the children to be systematic, e.g. make/sketch On plain paper?? cuboids with sides 2, 3 and 5, 2, 3 and 7, 2, 3 and 11, 2, 3 and 13, then 3, 5 and 7, 3, 5 and 11, 3, 5 and 13…  **Ext: Level Up 5-7 p98** | | Show children a measuring cylinder with 100ml of coloured water in it. Drop 100 centimetre cubes into it. *What is the new level? 200ml*! Discuss what this means. *1ml of water and 1cm3 take up the same amount of space! They have the same volume.* | | |

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|  | **Starters** | Whole class teaching | | | **Guided group and independent paired/indiv practice activities** | | | **Plenary** |
| Thursday 17th February | Complete **Maths Revision Morning Starter Powerpoint**  **Weekly** powerpoint Week 2.    **Slide 7** | | LO: To find the area of parallelograms  Explain that today, the children are going to work in mixed ability groups of 3 or 4 to work out how to calculate the area of a parallelogram. They will need to use their knowledge of calculating area from this week. They can use coloured squared paper and scissors to help them.   * Make sure all the children understand that a parallelogram has to have two pairs of parallel sides. * Stress the importance of accurately drawing parallelograms to include this feature.   They need to come up with theories and then test and prove them to be correct or not.  Try to help the chn as little as possible. See what they come up with.  Can they then come up with a basic formula to explain how you calculate the area of a parallelogram? (Area = base times height)  Resources if needed:  **Hamilton PPT slides 11-16**  OR  Watch [**https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-geometry-topic/cc-6th-parallelogram-area/v/intuition-for-area-of-a-parallelogram#:~:text=ar...%E2%80%9D-,the%20formula%20is%20area%20equals%20base%20times,area%20equals%20length%20times%20width**](https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-geometry-topic/cc-6th-parallelogram-area/v/intuition-for-area-of-a-parallelogram#:~:text=ar...%E2%80%9D-,the%20formula%20is%20area%20equals%20base%20times,area%20equals%20length%20times%20width)**.**  Watch ‘Area of parallelogram’ and complete ‘practice’ section together. | | | Whole class investigation in mixed abilities | Ask chn from the guided group to share the formula for finding the area of a parallelogram with the rest of the class. Can they explain why it works? | |
| Friday 18th February | Individual Times Tables grids | | | Developing, Expected, Embedded & Embedded+  Twinkl Arithmetic. KR to model a question/ method. Chn to then complete paper independently in 15 minutes. Mark as a class. | | |  | |

**Formula to find the area of a triangle is ½bh, ½ times base times height**

Imagine one or two rectangles round the triangle. Find the area of these rectangles, then halve to find the area of the triangle.

**Formula to find the area of a parallelogram is base times height:**

height

base

Cut off the two triangles and rearrange to form a rectangle.

height

base

base

**Resources**

* cm2 paper
* 0-9 dice
* Monday: Finding areas of triangles Activity sheets (versions for most children and for easier group) (*see resources*)
* Perimeter and area at <https://web.archive.org/web/20160522171041/http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/perimeter_and_area/index.html>
* A set of quadrilaterals on squared paper (*see resources*)
* 100 centimetre cubes
* Thursday: Finding volume of cuboids Activity sheets (versions for most children/harder group and for easier group) (*see resources*)
* Measuring cylinder with 100ml and 200ml clearly marked
* Food colouring to add to water
* Friday: Lists of years written using Roman numerals then Arabic numerals (*see resources*)
* [Abacus Year 6 Textbook 1](http://www.pearsonschoolsandfecolleges.co.uk/Primary/GlobalPages/AbacusFriendsofHamiltonTrust/SpecialOfferforFriendsofHamiltonTrust.aspx)

**Abacus Textbook Pages for Alternative/Additional Practice**

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| **Day** | **Group** | **Page** |
| Monday | Most children | Textbook 1, page 72 |
| Tuesday | Most children | Textbook 1, page 73 |
| Wednesday | Easier  Most children | Textbook 1, page 68  Textbook 1, page 69 |
| Thursday | Easier  Most children | Textbook 1, page 70  Textbook 1, page 71 |

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**Outcomes**

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| **Outcomes for most children** | | | | |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| 1. Find a formula to find the area of a triangle. | 1. Find a formula to find the area of a parallelogram. | 1. Recognise that shapes with the same areas can have different perimeters and vice versa.  2. Find areas and perimeters of rectilinear shapes. | 1. Understand and use a formula to find the volume of cuboids.  2. Know that volume is measured in cm3, m3 or km3. | 1. Find volumes of cuboids using prime factors. |
| **Default (outcomes for children not on statements but not able to reach the outcomes for most children)** | | | | |
| 1. Construct a rectangle around a triangle, find the area, then halve to find the area of the triangle. | 1. Find the area of parallelograms on squared paper, by dividing them into rectangles and triangles. | 1. Recognise that shapes with the same areas can have different perimeters and vice versa. | 1. Find the volume of cuboids by finding the number in one layer and multiplying by the number of layers.  2. Know that volume is measures in cm3, m3 or km3. | 1. Find volumes of cuboids using prime factors. |

**Only record names of children who struggled or exceeded these outcomes**