

**8B**

**Year 8 Maths ILA (Units 13/14)**

**Mathslinks 8B Book**

**Unit 13 (Algebra) & Unit 14 (SSM)**

Level 5/6 Level 5/6

**ONLY USE A CALCULATOR WHERE YOU SEE THIS SYMBOL C:\Users\cblaymire\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\C0A4LQYK\MC900389698[1].wmf**

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| **What is the purpose of this ILA?** | |
| * To encourage independent learning by students outside the classroom. * To develop a stronger understanding of algebra and shape, space and measure work at level 5/6. | |
| **What is expected from you?** | |
| * To complete your own work, to the best of your ability, with pride. * To show clear methods; show **all** your working out not just the answer. * Some students may struggle. If you find yourself “in the pit” you need to find a way out. * The Investigation is an important part of the ILA and must be attempted, showing reasonable effort. | |
| **Where can you get help?** | |
| * Look at the 8B Maths Links book (units 13 and 14). * Use the Maths ILA/homework Club after school on Tuesdays in S1. * Use the Unity College VLE (KS3). * Use the Learning Zone before or after school (8.00-8.35 Mon - Fri and 3.10-4.30 Mon - Thurs). * Use MyMaths.co.uk and Sam Learning. * Seek extra help at the Maths ILA Club. You are **expected** to attend to complete any parts you struggle with. | |
| **Learning Objectives** | |
| **Algebra**   1. To be able to substitute integers into formulae. 2. To be able to construct and solve linear equations. 3. To be able to solve problems involving finding the gradient of straight line graphs. 4. To be able to draw straight line graphs.   **SSM**   1. To be able to use bearings to specify direction. 2. To be able to recognise the nets of a cuboid. 3. To be able to calculate the surface area and volume of cuboids. | Level 5a  Level 6c  Level 6c  Level 6c  Level 6c  Level 5a  Level 6c |
| **Hints and Tips** | |
| * Surface area is the area of the net. * Volume = area of cross section x length. * Bearings are measured using three figures from north in a clockwise direction. | |
| **Keywords** | |
| |  |  |  | | --- | --- | --- | | substitution | bearings | volume | | formulae | surface area |  | | linear equations | net |  | |  |  |  | | |

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| **Learning Objective 1. To be able to substitute integers into formulae. Level 5a** |

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| 1.  a.  b.  c.  2. | The formula for the perimeter P of a rectangle is:  P = 2(l + w)  where l is the length and w the width.  If l = 5 cm and w is 9cm, what is P?  If P = 30 cm and w is 9cm, what is l?  Another rectangle has a length which is twice its width. If its perimeter is 24cm what is its width?  Doctors sometimes use this formula to calculate how much medicine to give a child.  Where: *c* is the correct amount for a child, in ml  *a*is the amount for an adult, in ml  *y*is the age of the child, in years  A child who is 4 years old needs some medicine. The amount for an adult is 20ml. Use the formula to work out the correct amount (c) for this child.  Answer:\_\_\_\_\_\_\_\_\_\_\_ml | (1 mark)  (1 mark)  (2 marks)  (2 marks) |
| **Learning Objective 2. To be able to construct and solve linear equations. Level 6c** | | |

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| 3.  a.  b.  c.  d. | Shelley goes to the shops and buys two packets of fruit  jellybeans.  There are *x* jellybeans in each packet.  How many jellybeans does Shelley have?  Give your answer in terms of *x*.  She then gives 10 away to her friend.  How many jellybeans does Shelley have now?  Give your answer in terms of *x*.  She now has 26 beans. Form an equation in terms of *x*.  Solve your equation to find how many jellybeans there are  in a full packet. | (4 marks) |
| 4.  a.  b.  c.  d.  e.  f.  g.  h.  i. | Solve the following linear equations: Show your working.  2w + 4 = 18  w = \_\_\_\_\_\_\_\_  4y – 6 = 30  y = \_\_\_\_\_\_\_\_  2(x – 4) = 18  x = \_\_\_\_\_\_\_\_  3y + 12 = 6  y = \_\_\_\_\_\_\_\_  4w = 10  w = \_\_\_\_\_\_\_\_  2(p – 4) = -6  p = \_\_\_\_\_\_\_\_  3x = 2x +10  x = \_\_\_\_\_\_\_\_  4 (y + 1) = 3 (y + 2)    y = \_\_\_\_\_\_\_\_  3 (2m – 4) = m + 3  m = \_\_\_\_\_\_\_\_ | (18 marks) |
| **Learning Objective 3. To be able to solve problems involving finding the gradient of straight line graphs. Level 6c** | | |

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| 5.  a.  b.  c.  d. | Here is the graph of a straight line, *L*:  ../../Illustrations/Used%20AW/JPEGS/13-04.jpg  The equation of *L* is *y* = *mx* + *2*, where *m* is the gradient of the line.  Use the graph to find the value of *m*.  m = \_\_\_\_  What is the value of *y* when *x* = 30?  answer = \_\_\_\_  What is the value of y when x = -5  answer = \_\_\_\_  On the same axes draw another line with a gradient equal to the gradient of *L*. | (4 marks) |
| **Learning Objective 4. To be able to draw straight line graphs.**  **Level 6c** | | |
| 6.  a.  b. | Complete this table of values for the equation y = 2x + 1.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 0 | 1 | 2 | 3 | 4 | | y |  |  |  |  |  |   Plot the points on this grid and join them to draw the graph of y = 2*x* + 1.    Then plot the lines y = 3 and x = 4 on the same grid | (5 marks) |
| **Learning Objective 5. To be able to use bearings to specify direction. Level 6c** | | | |

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| 7.  Figston | The following map shows the positions of different towns from Middle town.  N  Alton  Ginby  .  Middle  Borth  Eggle  Dilly  Cordy  Name the places that are on the following bearings from Middle:  279° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  040° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  141° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  082° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  243° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  294° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  201° \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (7 marks) |
| **Learning Objective 5. To be able to recognise the nets of a cuboid.**  **Level 5a** | | | |

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| 8. | Which of the following nets will produce a cuboid?  **A**  **B**  **C**  **D**  Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (2 marks) |
| **Learning Objective 6. To be able to calculate the surface area and volume of cuboids. Level 6c** | | |

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| 9.  a.  2 cm  b.  c.  3 mm  2 mm  11 mm | Calculate the surface area and volume of the following cuboids (don’t forget your units). Diagrams are not to scale.  4 cm  3 cm  Surface area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Volume \_\_\_\_\_\_\_\_\_\_\_\_\_\_  1 m  3 m  7 m  Surface area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Volume \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Surface area \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Volume \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | (6 marks) |

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| **Investigation** |

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| 1.    2. | Construct the following triangle accurately in the space below using a ruler and compasses:  6 cm  4 cm  80°  Construction rods  You have 9 construction rods with a hole at each end, which enables them to be fixed together. When you measure the distance between the holes you find that:  three have a 3cm gap  three have a 4cm gap  and three have a 5cm gap between the holes.  •  • •x 3 e.g.    • • x 3    • • x 3  •  •  •  Investigate how many different sized triangles you can make using these construction rods.  (space for working out) | (4 marks)  (20 marks) |

**Year 8 ILA – Mathslinks Book 8B Units 13 & 14**

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| **Level** | **Learning Objective** | **Pupil Assessment** | **Teacher Assessment** |
| 5a | To be able to substitute integers into formulae. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 6c | To be able to construct and solve linear equations. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 6c | To be able to solve problems involving finding the gradient of straight line graphs. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 6c | To be able to draw straight line graphs. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 6c | To be able to use bearings to specify direction. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 5a | To be able to recognise the nets of a cuboid. | ☹ 😐 ☺ | ☹ 😐 ☺ |
| 6c | To be able to calculate the surface area and volume of cuboids. | ☹ 😐 ☺ | ☹ 😐 ☺ |

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| **Parental Comment** |
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| **Teacher General Comment** |
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| **Teacher Investigation Comment** |
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