ELEMENTARY 4 – Knowledge organiser

Objective Code	Objective	
E4.1	**Interpret bar charts, pictograms and line graphs – solving problems** Li and Sue do the same survey. Their pictograms represent the **same information**. **Li's pictogram** Male ▢▢▢▢ Female ▢▢▢ Key: ▢ represents 2 people **Sue's pictogram** Male ○○ Female ○◔ Sue has forgotten to write her key. How many people does ○ represent? **Step 1** Calculate the totals from the first pictogram using the key. (male = 8, female = 6) **Step 2** In the second pictogram equate the number of symbols (for male) with the total for male from the first pictogram. (2 circles = 8 male) **Step 3** Use your information to write down the key (1 circle = 4 people)	
E4.2	Use the 4 operations including formal written methods with positive and negative integers Calculate (a) 4 - - 12, (b) 4 x -12 (c) -12 ÷ -4 (d) -4 - 12 (a) Identify that two negative symbols side by side make a positive, therefore 4 - - 12 means 4 + 12 = 16	

ELEMENTARY 4 – Knowledge organiser

	(b) Positive x negative = negative, therefore 4 x -12 = -48 (c) Negative ÷ negative = positive, therefore -12 ÷ -4 = 3 (d) "Two negatives make a positive" does NOT apply here. Start at -4 on a number line, subtract 12 so move down the number line, therefore -4 – 12 = -16	
E4.3	Compare and order fractions, including fractions > 1 **Put these fractions in order of size, starting with the smallest** $\frac{2}{3}$ $\frac{9}{15}$ $\frac{7}{5}$ $1\frac{1}{2}$ **Step 1** Convert the mixed number to an improper fraction ($1\frac{1}{2} = \frac{3}{2}$) **Step 2** Find a common denominator and then find all the relevant equivalent fractions CD = 30 so $\frac{2}{3} = \frac{20}{30}$ $\frac{9}{15} = \frac{18}{30}$ $\frac{7}{5} = \frac{42}{30}$ $\frac{3}{2} = \frac{45}{30}$ **Step 3** Put the new fractions in order, smallest first. Remember to write the original fractions down $\frac{9}{15}$ $\frac{2}{3}$ $\frac{7}{5}$ $1\frac{1}{2}$	
E4.4	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions **Calculate** $2\frac{7}{10} - 1\frac{1}{3}$ **Step 1** do the whole number calculation first (2 – 1 = 1 so you now have $1\frac{7}{10} - \frac{1}{3}$ **Step 2** Find a common denominator and then find equivalent fractions. CD = 30 so $\frac{7}{10} = \frac{21}{30}$ *and* $\frac{1}{3} = \frac{10}{30}$ **Step 3**	

ELEMENTARY 4 – Knowledge organiser

	do the subtraction (remember the 1 with the first fraction! $1\frac{21}{30} - \frac{10}{30} = 1\frac{11}{30}$	
E4.5	Multiply simple pairs of proper fractions, writing the answer in its simplest form $\frac{2}{3} \times \frac{1}{6}$ Step 1 – Multiply the numerators together 2 x 1 = 2 Step 2 – Multiply the denominators together 3 x 5 = 18 Step 3 – Write as a single fraction then simplify if applicable $\frac{2}{18} = \frac{1}{9}$	
E4.6	a) Divide any proper fraction by a whole number $\frac{2}{3} \div 6$ Step 1 – Write 6 as a fraction $6 = \frac{6}{1}$ Step 2 – Dividing by a fraction is the same as multiplying by its "reciprocal" so $\frac{2}{3} \div \frac{6}{1}$ becomes $\frac{2}{3} \times \frac{1}{6} = \frac{2}{18} = \frac{1}{9}$ b) Divide any given fraction by any other given fraction $\frac{2}{3} \div \frac{1}{5}$ Step 1 – Dividing by a fraction is the same as multiplying by its "reciprocal" so $\frac{2}{3} \div \frac{1}{5}$ becomes $\frac{2}{3} \times \frac{5}{1} = \frac{10}{3}$ Step 2 – Convert into a mixed number where applicable	

ELEMENTARY 4 – Knowledge organiser

	$\frac{10}{3} = 3\frac{1}{3}$	
E4.7	Associate a fraction with division and calculate decimal fraction equivalent. a) Write $\frac{3}{8}$ as a decimal. Step 1 – The line in a fraction means divide so use division (bus-stop method and input extra zeros after the decimal point if necessary) $8 \overline{)\,3.000}$ with 0.375 above Step 2 – Write answer as a decimal $\frac{3}{8}$ = 0.375 b) Write 0.24 as a fraction Step 1 – Identify the column the last digit is in (in terms of tenths, hundredths etc) 4 is in the hundredths column Step 2 – Write the decimal part of the question as a fraction over the column identified and simplify if applicable $0.24 = \frac{24}{100} = \frac{6}{25}$	
E4.8	Complete a table of values for a function For the linear function y = 2x + 1, generate a table of values	

x	-2	-1	0	1	2	3
y = 2x+1						

ELEMENTARY 4 – Knowledge organiser

<table>
<tr>
<td></td>
<td>
Step 1 – Substitute x = 0 into the equation y = 2x + 1
y = 2 x 0 + 1 = 1
Step 2 – Substitute the positive x numbers into the equation
y = 2 x 1 + 1 = 3
y = 2 x 2 + 1 = 5
y = 2 x 3 + 1 = 7

Step 3 – Substitute the negative x numbers into the equation
y = 2 x -2 + 1 = -3
y = 2 x -1 + 1 = -1

Step 4 – Check that for consecutive x values, the corresponding y values follow a linear pattern
<table>
<tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>y = 2x+1</td><td>-3</td><td>-1</td><td>1</td><td>3</td><td>5</td><td>7</td></tr>
</table>
Notice the y values go up in 2s (link to the equation y = <u>2</u>x + 1)
</td>
<td></td>
</tr>
<tr>
<td>E4.9</td>
<td>
Inverse operations
Solve basic equations using inverse operations

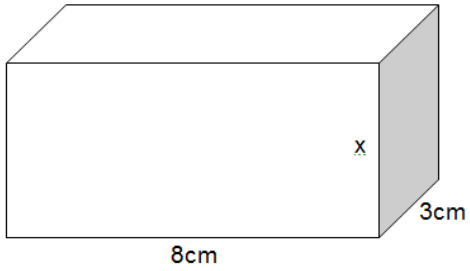
Step 1 – Know that addition and subtraction are inverse (opposite) operations of each other, and multiplication and division are inverse operations of each other

Step 2 – Identify the operation in the question and use the inverse
(a) x + 7 = 20 (use -)
(b) 8 = h – 17 (use +)
(c) 5 x t = -30 (use ÷)
(d) 1.65 = $\frac{k}{8}$ (use x)
Step 3 – Balance the equation by doing the same operation to both sides
(a) x + 7 – 7 = 20 – 7
</td>
<td></td>
</tr>
</table>

ELEMENTARY 4 – Knowledge organiser

	(b) 8 + 17 = h – 17 + 17 (c) 5 x t ÷ 5= -30 ÷ 5 (d) 1.65 x 8 = $\frac{k}{8}$ x 8 Step 4 – Simplify both sides of the equation (a) x = 13 (b) 25 = h (c) t = -6 (d) 13.2 = k	
E4.10	Substitute numerical values into formulae and expressions, including scientific formulae (including negative integers and fractional values) Given that a = 5 and b = -4.1 and c= $\frac{2}{3}$, find (a) 4b + 2a, (b) $\frac{3}{c}$ Step 1 – Substitute (replace) the variables (letters) with the numbers given: (a) 4b + 2a = 4 x -4.1 + 2 x 5 (b) $\frac{3}{c} = \frac{3}{\frac{2}{3}}$ Step 2 – Work out the values (a) -6.4 (b) $\frac{3}{\frac{2}{3}}$ means 3 ÷ $\frac{2}{3}$ = 4.5 (see E4.6)	
E4.11	Derive and apply formulae to calculate and solve problems involving cubes and cuboids	

ELEMENTARY 4 – Knowledge organiser

	 The volume of the cuboid is 120cm^3. Work out the length of the side marked with an x.	Step 1 Substitute the values into the formula V=lwh 120 = 8 x 3 x x step 2 Rearrange the formula so x=..... x= 120 ÷ (8 x 3) Step 3 Calculate the missing length (remember to give the units) x = 5cm	
E4.12	For non-grouped data given in the form of a table, find the mean, median, mode and range.		A wildlife group investigates the size of hedgehog families in one area of the city. Their results are below. How many families did they track? Work out the mean, median, mode and range size of litter.

Size of litter	Frequency
1 or 2	0
3	3
4	7
5	11
6	9
> 6	0

ELEMENTARY 4 – Knowledge organiser

Two seaside resorts boast they have the least rain in August.
Seaport says “we have less than 5 days of rain on average”
Oceanview says “on average we have 5 days of rain”
Use the table of data from 25 years to decide if these claims are correct.

No of rainy days	Frequency in seaport	Frequency in oceanview
1	III	I
2	III	IIII
3	IIIII	IIIII
4	III	I
5	I	II
6	II	IIII
7	I	III
8	II	II
9	III	IIIII

A class were asked how long they spent revising for an exam.

Girls

Hours	Frequency
0	0
1	2
2	3
3	4
4	5
5	1

Boys

Hours	Frequency
0	2
1	7
2	2
3	2
4	1
5	1

By calculating the mean, comment on the amount of time the girls spent compared to the boys.

ELEMENTARY 4 – Knowledge organiser

Here is a part completed frequency table.
It shows the number of goals a team scored in each match during a season.

Number of goals scored	Frequency	Total num goals sc
0	5	0
1		
2		24
3	9	
4		20
5		10
		100

Complete the table.
Work out an estimate for the mean number of goals the team scored during the season.