

St Ninian's High School



# Mathematics Department

## Level 3


### TJ Book

# Pupil Learning Log

- I understand this part of the course = 👍
- I am unsure of this part of the course = 🙋
- I do not understand this part of the course = 🗨

Name \_\_\_\_\_ Class \_\_\_\_\_ Teacher \_\_\_\_\_

Level 3 Course Checklist

		Name: .....								
Mathematics Department		Non-Calculator Work - Level 3								
	Estimating & Rounding	Whole Numbers & Integers	Algebra	Decimals	Multiples, Factors & Primes	Speed, Distance & Time	Statistics	Proportion & Scale	Ratio, Fractions & Percentages	Length, Area & Perimeter
Ex 1										
Ex 2										
Ex 3										
Ex 4										
Ex 5										
Ex 6										
Ex 7										
Ex 8										
Ex 9										
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Ex 17										
Ex 18										
Ex 19										
Ex 20										
<b>Total</b>										

Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 1 - Integers (Chapter 2)



1. Understand – concept of +ve and –ve numbers

2. Use thermometer  
– to add / sub integers mentally



3. The double negative

$$(-3) - (-7) = 4$$

4. Multiplication of integers.

$$(-2) \times 5 = -10$$

$$(-5) \times (-6) = 30$$

5. Division of integers

$$(-80) \div 5 = -16$$

$$(-16) \div (-2) = 8$$

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Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 2 – Type of Numbers (Chapter 5)



1. Multiples and L.C.M. ( Lowest Common Multiples)

For 4 and 12 LCM = 12

2. Factors and H.C.F. ( Highest Common Factor)

For 4 and 12 HCF = 4

3. Prime Numbers and prime decomposition.

$12 = 2 \times 2 \times 3$

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Pupil Comment \_\_\_\_\_

# Level 3 Course Checklist

## Topic 3 – Scientific Notation (Chapter 7)



1. Large Numbers – scientific notation

$$456000 = 4.56 \times 10^5$$

2. Scientific Notation to normal form

$$2.3 \times 10^3 \rightarrow 2300$$

3. Small numbers – scientific notation and vice-versa

$$0.00743 = 7.43 \times 10^{-3}$$

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Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 4 – Decimals (Chapter 13)



1. Revision - Level E decimals.
  
2. Addition / Subtraction – decimals.  
 Decimal point must be under each other.
  
3. Multiplying - decimal by a single digit.
  
4. Division – decimal by a single digit.  

$$\begin{array}{r} 8.16 \\ 5 \overline{)40.80} \end{array}$$
  
5. Multiplying – two simple decimals.  

$$0.2 \times 0.2 = 0.04$$
  
6. Dividing – two simple decimals.  

$$0.8 \div 0.2 = 8 \div 2 = 4$$
  
7. Rounding – to any number of decimal places.  

$$7.835 \rightarrow 7.84 \text{ (to 2 d.p.)}$$
  
8. Rounding – to significant figures.  

$$6793 \rightarrow 6800 \text{ to 2 sig. fig.}$$
  
9. Money Calculations

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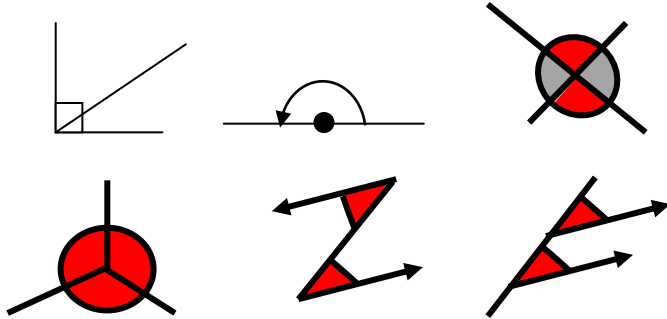
Pupil Comment \_\_\_\_\_

# Level 3 Course Checklist

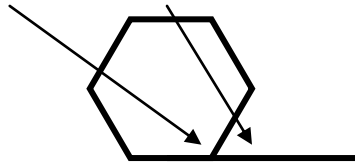
## Topic 5 – Angles (Chapter 3)



1. Revision - Level E angles.



2. Interior and exterior angles



3. Clock Face



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Pupil Comment \_\_\_\_\_

# Level 3 Course Checklist

## Topic 6 – Algebra (Chapter 11)



1. Simplifying – expressions

$$12y + 5m - 3y + 3m = 9y + 8m$$

2. Expanding - brackets

$$3(p + 7) = 3p + 21$$

3. Simplifying – expressions with brackets

$$8(h + 3) - 8h = 8h + 24 - 8h = 24$$

4. Evaluating – expressions

$$a = 1 \quad b = (-3) \quad c = 4$$

$$abc = 1 \times (-3) \times 4 = -12$$

5. Factorise - expressions

$$3y^2 - 6y = 3y(y - 2)$$

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Pupil Comment \_\_\_\_\_



# Level 3 Course Checklist

## Topic 7 – Statistics (Chapter 17)



1. Terminology – Mean, median, mode and range.

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2. Frequency Tables.

Weekly wages in \$ of 25 workers	Tally marks	Frequency
200 - 234		2
235 - 249		3
250 - 264		4
265 - 279		3
280 - 294		4
295 - 309		1
310 - 324		1
Total		25

2		
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3. Mean – from a frequency table.

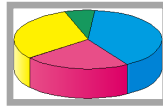
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4. Cumulative Frequency tables – median.

Marks	Frequency	Cumulative Frequency
0 - 10	2	2
10 - 20	8	10
20 - 30	12	22
30 - 40	18	40
40 - 50	28	68
50 - 60	22	90
60 - 70	6	96
70 - 80	4	100

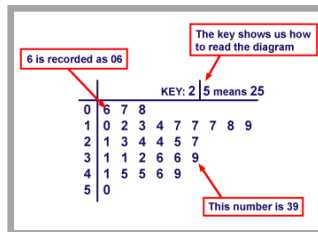
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5. Construct – Pie Charts



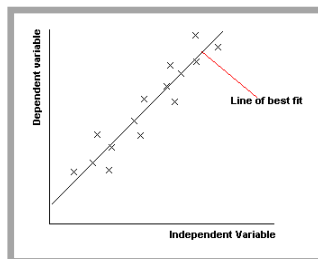
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6. Stem and Leaf diagrams.



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7. Scattergraphs



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8. Probability  
The chance of an event happening




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## F1 – Test (Topics 1-7)

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## Level 3 Course Checklist

Results of F1 Test				
Outcome		Score		
Number Money & Measurement				
Shape, Position & Movement				
Information handling				
Problem Solving & Enquiry				
Total			%	
Question	Topic	mark	I know this	Needs
1	Integers	/1		
2	Calculations with negative numbers	/6		
3	Factor tree & prime factors	/3		
4	Scientific notation	/2		
5	Algebra - substitution	/8		
6	Algebra - brackets	/4		
7	Algebra - factorising	/4		
8	Rounding	/2		
9	Multiplication & division of decimals	/6		
10	Find missing angles	/8		
11	Mean, mode, median & range	/7		
12	Stem & leaf diagram	/4		
13	Problem solving - pendulum (multiples)	/4		
14	Problem solving - Area using algebra	/6		
<b>Total</b>		<b>/65</b>		

Next Steps

Guardian's Signature : \_\_\_\_\_

Pupil Comment \_\_\_\_\_

# Level 3 Course Checklist

## Topic 8 – Time Distance Speed (Chapter 47)



1. Revision of time – conversions and time intervals

2. Speed (Remember to convert time !)

$$S = \frac{D}{T}$$



3. Distance (Remember to convert time !)

$$D = ST$$

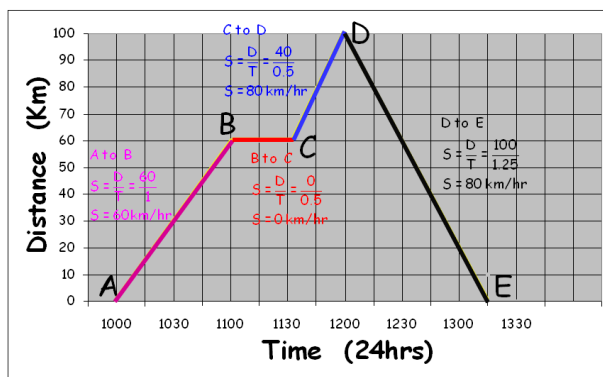
4. Time

$$T = \frac{D}{S}$$

5. Mixed questions



6. Time / Distance / Speed graphs



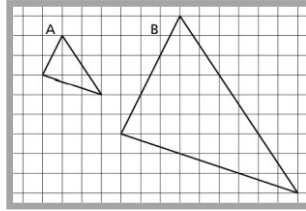
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## Level 3 Course Checklist

### Topic 9 – Scales & Drawing (Chapter 37)

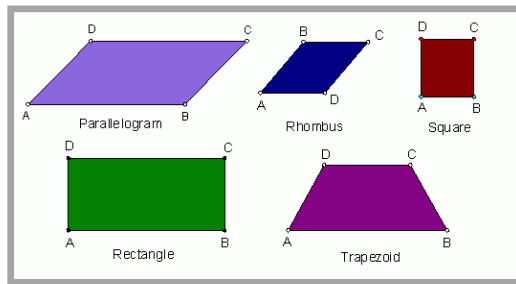


1. Enlargement & Reduced shapes

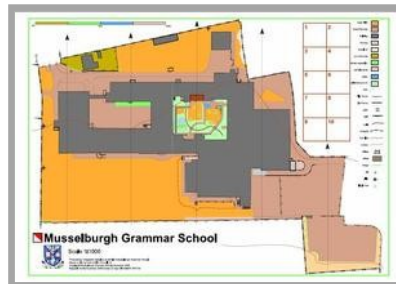


2. Revise drawing triangles

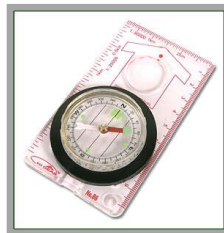
3. Drawing Quadrilaterals



4. Scales - reading maps



5. Bearings problems



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Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 10 – Equations / Inequations (Chapter 43)



1. Revision – Level E equations.

$$2y + 6 = 10$$

$$2y = 4$$

$$y = 2$$



2. Harder equations – including negatives and brackets.

$$-2(y - 4) = 20$$

$$-2y + 8 = 20$$

$$-2y = 12$$

$$y = -6$$

3. Equations – with fractional coefficients.

$$\frac{(y-5)}{3} = 10$$

$$y - 5 = 30$$

$$y = 35$$

4. Inequalities

$$3y + 5 \geq 20$$

$$3y \geq 15$$

$$y \geq 5$$

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## Level 3 Course Checklist

### Topic 11 – Pythagoras Theorem (Chapter 59)



1. Squares and roots

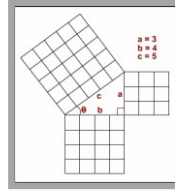
$$6^2 = 36 \quad \sqrt{49} = 7$$

2. Pythagoras Theorem

(Right angled triangles **ONLY**)

Hypotenuse is always the longest side

which is always opposite the right angle.



$$(\textit{Hypotenuse})^2 = (\textit{smaller side})^2 + (\textit{other smaller side})^2$$

3. Calculating – Hypotenuse.

$$(\textit{Hypotenuse})^2 = (\textit{smaller side})^2 + (\textit{other smaller side})^2$$

4. Calculating – smaller side.

$$(\textit{smaller side})^2 = (\textit{Hypotenuse})^2 - (\textit{other smaller side})^2$$

5. Mixed questions

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Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 12 – Percentages (Chapter 19)



1. Revision – Level E percentages.

15% of 40

2. Percentage – Increase / Decrease  
(Appreciation / Depreciation)

A jumper increases from £20 to £22.  
What is the percentage increase?

$$\frac{2}{20} \times 100 = 10\%$$

3. A as a percentage of B

40 out of 50 as a percentage  $\frac{40}{50} \times 100 = 80\%$

4. Finding Initial Value

In a sale there is 20% off everything.  
In the sale a CD cost £8, what was the original cost.

$$80\% \rightarrow \text{£}8$$

$$1\% \rightarrow \text{£}0.10$$

$$100\% \rightarrow \text{£}0.10 \times 100 = \text{£}10$$

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# Level 3 Course Checklist

## Topic 13 – Fractions (Chapter 31)



### 1. Equivalent fractions

$$\frac{8}{16} = \frac{1}{2}$$

### 2. Addition & Subtractions of simple fractions

$$\frac{2}{7} + \frac{1}{7} = \frac{3}{7} \qquad \frac{5}{8} - \frac{4}{8} = \frac{1}{8}$$

### 3. Addition & Subtractions of harder fractions

$$\frac{2}{3} + \frac{1}{2} = 1\frac{1}{6} \qquad \frac{2}{3} - \frac{1}{2} = \frac{1}{6}$$

### 4. Multiplying fractions

$$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$$

### 5. Division of fractions

$$\frac{2}{5} \div \frac{1}{4} = \frac{2}{5} \times \frac{4}{1} = \frac{8}{5} = 1\frac{3}{5}$$

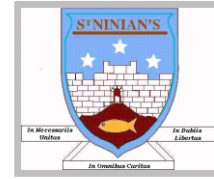
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## F2 Test (Topics 8 – 13)

<b>For my F2 test I will</b>
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Level 3 Course Checklist

Results of F2 Test		
<b>Outcome</b>	<b>Score</b>	
Number Money & Measurement		
Shape, Position & Movement		
Information handling		
Problem Solving & Enquiry		
<b>Total</b>		%



Question	Topic	mark	I know this	Needs revision
<b>Part A ( non-calculator )</b>				
1	Solving Equations	/14		
2	Solving Inequations	/4		
3	Make an equation using area & solve	/7		
4	Change fraction to mixed number	/1		
5	Change mixed number to fraction	/1		
6	Add,subtract,multiply & divide fraction	/10		
7	Calculate percentage discount	/3		
8	Calculate percentage profit	/3		
9	Fractions problem solving	/4		
<b>Part B ( Calculator )</b>				
1	Change hours & mins to decimal time	/2		
2	Change decimal time to hours & mins	/2		
3	Calculate distance, given speed & time	/3		
4	Calculate time,given speed & distance	/3		
5	Distance-Time graph	/6		
6	Scale	/3		
7	Draw straight lines	/2		
8	Scale drawing using bearings	/5		
9	Pythagoras Theorem	/6		
10	Pythagoras Theorem problem solving	/4		
11	Pythagoras Theorem problem solving	/5		
	<b>Total</b>	<b>/88</b>		

## Next Steps

Guardian's Signature : \_\_\_\_\_

Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

### Topic 14 – Areas (Chapter 23)



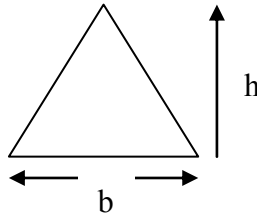
#### 6. Revision of Level E

Square          Rectangle          Right-Angle Triangle

$$A = l \times l \qquad A = l \times b \qquad A = \frac{1}{2}bh$$

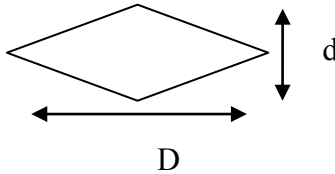
#### 7. Any of Triangle

$$A = \frac{1}{2}bh$$



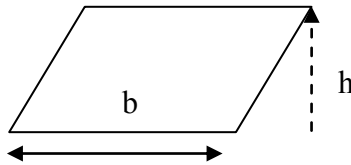
#### 8. Rhombus and Kite

$$A = \frac{1}{2}Dd$$



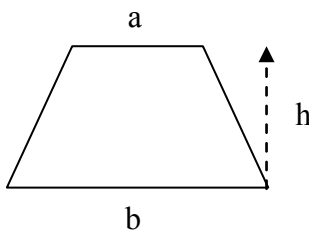
#### 9. Parallelogram

$$A = bh$$

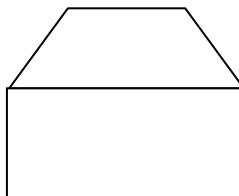


#### 10. Trapezium

$$A = \frac{1}{2}(a+b)h$$



#### 11. Composite Shapes



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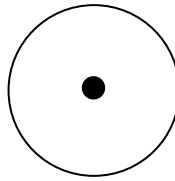
Level 3 Course Checklist

Topic 15 – Circle Work (Chapter 29)



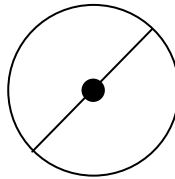
1. Circumference of a Circle

$$C = \pi D \quad \text{or} \quad C = 2\pi r$$



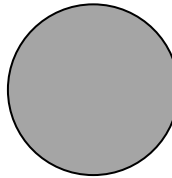
2. Finding the Diameter of a Circle

$$D = \frac{C}{\pi}$$



3. Area of a Circle

$$A = \pi r^2$$



4. Mixed Problems

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## Level 3 Course Checklist

### Topic 16 – Ratio / Proportion (Chapter 41)



1. Simple Ratios

$$2:3$$

2. Simplifying Ratios – Fractional Ratios

$$6:24 = 1:4 \qquad \frac{1}{2}:3 \qquad 1:6$$

3. Ratio Calculations

	Cats	Dogs	
	3	4	
x 9	↙	↘	x 9
	27	36	

4. Proportional Division - Split £60 in ratio 2:3

number of shares  $2 + 3 = 5$

$$1 \text{ share} = \frac{12}{5} \times 60 \qquad 2:3 \qquad \text{£}24 : \text{£}36$$

5. Proportion

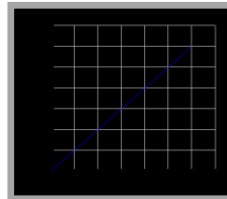
$$1 \rightarrow \text{£}20$$

$$5 \rightarrow \text{£}20 \times 5 = \text{£}100$$

6. Direct Proportion

Books		Cost	
6	⇒	£4.20	
1	⇒	$4.20 \div 6 = \text{£}0.70$	
5	⇒	$5 \times 70 = \text{£}3.50$	

7. Linear Graphs of Direct Proportion



8. Inverse Proportion – Building a house

Men		Months	
10	⇒	12	
1	⇒	$10 \times 12 = 120$	
8	⇒	$120 \div 8 = 15$	

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## Level 3 Course Checklist

### Topic 17 – Linear Patterns (Chapter 53)



#### 1. Simple Linear Patterns

$$y = ax$$

#### 2. Harder Linear Patterns

$$Y = ax + b$$

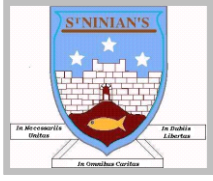
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## F3 Test (Topics 14 – 17)

For my F3 test I will
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Pupil Comment \_\_\_\_\_

## Level 3 Course Checklist

Results of F3 Test																
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th style="width: 70%;">Outcome</th> <th style="width: 30%;">Score</th> </tr> </thead> <tbody> <tr> <td>Number Money &amp; Measurement</td> <td style="text-align: center;"> </td> </tr> <tr> <td>Shape, Position &amp; Movement</td> <td style="text-align: center;"> </td> </tr> <tr> <td>Information handling</td> <td style="text-align: center;"> </td> </tr> <tr> <td>Problem Solving &amp; Enquiry</td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: right;"><b>Total</b></td> <td style="text-align: center;"> </td> </tr> </tbody> </table>		Outcome	Score	Number Money & Measurement		Shape, Position & Movement		Information handling		Problem Solving & Enquiry		<b>Total</b>				
Outcome	Score															
Number Money & Measurement																
Shape, Position & Movement																
Information handling																
Problem Solving & Enquiry																
<b>Total</b>																
		%														
Question	Topic	mark	I know this	Needs revision												
1a,b,c	Area of triangle, parallelogram, trapezium	/6														
2	Area of kite	/4														
3	Given Area, find missing side	/2														
4	Circumference of a circle	/3														
5	Find the Diameter given the circumference	/2														
6	Calculate perimeter of composite shape	/3														
7	Calculate the area of circle	/2														
8	Calculate area of composite shape	/4														
9	Simplify basic ratios	/3														
10	Given the ratio find the missing answer	/3														
11	Share out a money into a given ratio	/3														
12	Direct proportion	/2														
13	Indirect proportion	/3														
14	Complete table and find a formula	/4														
15	Find a formula decreasing sequence	/3														
<b>Total</b>		<b>/47</b>														

Next Steps

Guardian's Signature : \_\_\_\_\_

Pupil Comment \_\_\_\_\_





