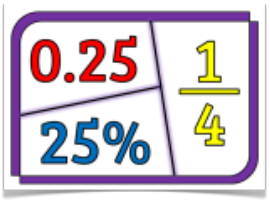
**Y10 Unit 3 Overview-Sequences, Graphs and FDPR:**

**Test Window: 30th April 2018- 4th May 2018**

**Target grade for tests:**




**You will learn about:**

- Sequences
- Graphs
- Converting between, and calculating with Fractions, Decimals and Percentages
- Ratio
- Compound units eg speed

**You will be able to:**

- Generate terms of a sequence
- Find the nth term of a linear sequence.
- Plot graphs of equations that correspond to straight-line graphs
- Identify and interpret gradients and intercepts of linear functions graphically
- Recognise, sketch and interpret graphs of linear functions and simple quadratic functions
- Plot and interpret graphs and graphs of real contexts e.g. involving distance and speed
- Change between terminating decimals and fractions
- Apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing)
- Use compound units (such as speed, rates of pay, unit pricing)
- Change freely between compound units (e.g. speed, rates of pay, prices) in numerical contexts
- Calculate with fractions and percentages
- Solve problems involving percentage change, including original value problems, and simple interest including in financial mathematics

**Lesson Overview**

SEQUENCES

- Generate a sequence from a term-to-term rule
- Understand the meaning of a position-to-term rule
- Use a position-to-term rule to generate a sequence
- Find the position-to-term rule for a given sequence
- Use algebra to describe the position-to-term rule of a linear sequence (the nth term)
- Use the nth term of a sequence to deduce if a given number is in a sequence

GRAPHS

- Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear
- Plot graphs of functions of the form $y = mx + c$ ($x \pm y = c$, $ax \pm by = c$)
- Understand the concept of the gradient of a straight line
- Find the gradient of a straight line on a unit grid
- Find the y-intercept of a straight line
- Sketch a linear graph
- Distinguish between a linear and quadratic graph
- Plot graphs of quadratic functions of the form $y = x^2 \pm c$
- Sketch a simple quadratic graph
- Plot and interpret graphs of piece-wise linear functions in real contexts
- Plot and interpret distance-time graphs (speed-time graphs)
- Find approximate solutions to kinematic problems involving distance and speed

**Key Words**

**Refer to http://studymaths.co.uk/glossary.php for definitions of the key words**

Sequence
Linear
Term
Difference
Term-to-term rule
Position-to-term rule
Ascending
Descending

**Notation**

T(n) is often used when finding the nth term of sequence

Plot
Equation (of a graph)
Function
Formula
Linear
Coordinate plane
Gradient
y-intercept
Substitute
Quadratic
Kinematic, Speed, Distance

EXPLORING FRACTIONS, DECIMALS AND PERCENTAGES

- Identify if a fraction is terminating or recurring
- Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths)
- Write a decimal as a fraction
- Write a fraction in its lowest terms by cancelling common factors
- Identify when a fraction can be scaled to tenths or hundredths
- Convert a fraction to a decimal by scaling (when possible)
- Use a calculator to change any fraction to a decimal
- Write a decimal as a percentage
- Write a fraction as a percentage

PROPORTIONAL REASONING

- Identify ratio in a real-life context
- Write a ratio to describe a situation
- Identify proportion in a situation
- Find a relevant multiplier in a situation involving proportion
- Use fractions fluently in situations involving ratio or proportion
- Understand the connections between ratios and fractions
- Understand the meaning of a compound unit
- Know the connection between speed, distance and time
- Solve problems involving speed
- Identify when it is necessary to convert quantities in order to use a sensible unit of measure

CALCULATING FRACTIONS, DECIMALS AND PERCENTAGES

- Calculate percentages of amounts with and without a calculator
- Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100%
- Use calculators to increase an amount by a percentage greater than 100%
- Solve problems involving percentage change
- Solve original value problems when working with percentages
- Solve financial problems including simple interest
- Understand the meaning of giving an exact solution
- Solve problems that require exact calculation with fractions

**Notation**

$y = mx + c$

Fraction
Mixed number
Improper fraction
Top-heavy fraction
Percentage
Decimal
Proportion
Terminating
Recurring

Ratio
Proportion
Proportional
Multiplier
Speed
Unitary method
Units
Compound unit

**Notation**

Kilometres per hour is written as km/h or $kmh^{-1}$
Metres per second is written as m/s or $ms^{-1}$

Simplify, cancel, lowest terms
Percentage change
Original amount
Multiplier
Simple interest
Compound interest

**Suggested reading or support/ challenge available**

Support is available from a Maths teacher in '*MORALE*' in M1 daily from 1:30pm -1:45pm

**Pixl Maths App**

login: PY2415

username: surname followed by first initial

password: first name

**www.doddlelearn.co.uk**

login: your name (capitals for initials no spaces) followed by year of entry eg BenSmith13

password: **penryn**

**Cross curricular**

*SMSC:*

1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.
3.1 Developing personal qualities and using social skills (regular paired/ group work communication).
3.2 Participating, cooperating and resolving conflicts (paired/group activities).
4.2 Experiencing fascination, awe and wonder of mathematics.
4.4 Using imagination and creativity in learning.

*Literacy:*

Verbal communication of understanding using key words in the correct context.
Development of written communication of methods and strategies to problem solve.

**www.corbettmaths.com**

Perfect for revision. Including practice exam questions on specific topics and the "5-a-day"

**https://vle.mathswatch.com/vle/**

**(video clips and worksheets)**

login: school username followed by **@penryn-college**

password: **Penryn2016**

**Use your revision guide**

Use the code in the front of your guide to access your free online revision

**www.justmaths.co.uk/online**

login: PenrynStudent

password: Penryn

*NAC:*

**Science** – Solve problems using intersections or gradients of graphs. Understand and use fraction, decimal and percentage equivalence. Use simple ratio and proportion. Calculate using ratios. Calculate percentages of quantities. Calculate a number as a percentage of another.

**RE -** Calculate percentages of quantities.

**Business –** Use simple ratio and proportion. Calculate percentages of quantities. Calculate a number as a percentage of another.

**Geography –** Understand and use fraction, decimal and percentage equivalence. Use simple ratio and proportion.

**Creative Arts –** Calculate using ratios.

**Technology** – Use simple ratio and proportion. Calculate using ratios. Calculate percentages of quantities.

**Art –** Use simple ratio and proportion.