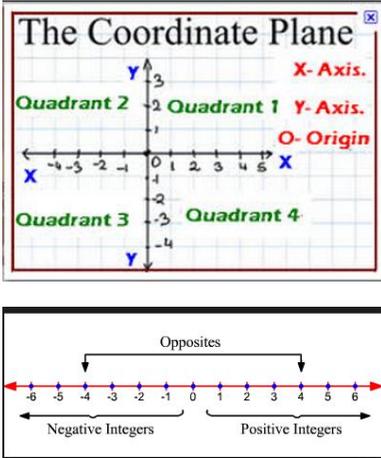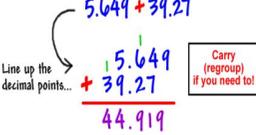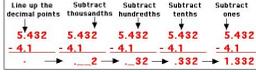| What is it that we want our students to know, understand, do and communicate KUDCO?					
Year Level: Six	**Semester:** One	**Subject:** Maths	**Team Members:** Sarah Mason, Shane Collins, Patrick Liederbach		
Essential Learning What is the essential learning? Describe in student friendly vocabulary.	**Example-Rigor** What does proficient student work look like? Provide an example and/or description.	**Prior Skills Needed** What prior knowledge, skills and/or vocabulary are needed for a student to master this essential learning?	**Common Assessments** What assessment/s will be used to measure student mastery?	**When taught?** When will this essential learning be taught?	**Extension Skills** What will we do when students have already learned this essential learning?
Numbers I can identify, describe and represent the properties of prime, composite, square and triangular numbers.	Write whether each number is prime or composite. 1 21 _____ 2 36 _____ 4 87 _____ 5 62 _____ 5 Draw patterns to show the following square numbers. 16 36 6 Draw patterns to show the following triangular numbers. 15 21	Factors and Multiples Factor trees Identify and describe all factors of whole numbers and use them to solve problems.	Team designed CFA Warmups Quick Checks Checklists Mathletics	**Term 1 Weeks 2-4** ≅3- 5 lessons	Express whole numbers as products of its prime factors. Express this in index form. I can describe the relationship between perfect squares and square roots.
Four Operations I can select and apply efficient mental and written strategies to **solve problems** involving **all four operations** with whole numbers	**Expectations:** Students can solve closed & open ended problems at an appropriate difficulty level for the year 6 standard. See examples in the link below: https://acaraweb.blob.core.windows.net/curriculum/worksamples/Year_6_Mathematics_Portfolio_Satisfactory.pdf	Concrete knowledge of the problem solving strategies (mathematicians toolbox) Four Proficiencies Vocabulary: Understanding, Fluency,	Team designed CFA developed from proficiency scale. (PRE and POST) Work samples Quick checks - Warm up	**T1 Weeks 4 - 9**	design, create and deconstruct problems justify and compare strategy selection for

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and use digital technologies where appropriate. **Learning Targets:** I can: - apply a range of strategies to solve realistic problems and commenting on the efficiency of different strategies - solve problems selecting appropriate operation strategies and problem solving strategies	Students select appropriate and most efficient operation to use for any given problem. Students use effective problem solving strategy (moving from more simple to complex strategy) Students can use symbols or words to determine the most efficient operation Students explain their problem solving through the four proficiencies (as demonstrated on a think board) Students can make explicit their reasoning (separate from their working out/understanding) **Example problem:** Two legged, three legged and nine legged aliens attend an alien convention. After an hour there were 144 legs at this convention. Using the four proficiencies show your understanding on a think-board and determine how many aliens were at the convention.	Problem Solving and Reasoning Using place value system to estimate **Fact families:** (prior knowledge of multiplication and known facts) **-Part, Part, Whole: Partitioning** **Addition:** Add a three digit number to a three digit number and beyond. **Subtraction:** Subtract a one or two digit number from a larger number including those that result in a remainder. **Multiplication** multiply a three digit number by one or two digits. **Division** divide a three digit number by a one digit number, including those that result in a remainder	- One operation Mathletics Conferencing		operations for efficiency (would you rather) inventory their mental, written and problem solving strategies evaluate problem solving (on a rubric) formulate their reasoning in written language compare and contrast reasoning (with another person)

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BODMAS I can solve and create number sentences involving brackets and order of operations. **Learning Target** I can: - create number sentences involving BODMAS that result in a given answer. - understand and apply the rules for completing multiple operations within the same number sentence (BODMAS) (F) - understand and explain why brackets are used in number sentences	*What different number sentences can you create that equal 35?* $5 \times 7 = 35$ $70 \div 2 = 35$ $30 + 5 = 35$ $60 - 25 = 35$ $40 - 5 = 35$ *Can you include brackets and order of operations in your number sentences?* $(2 \times 0) - (2.5 \times 2) = 35$ $(6 \times 4) + (5 \times 2) + (2 \div 1) = 35$ $(7 - 2) + (15 \times 2) = 35$ *Can you explain the rules for order of operations?* Brackets - Brackets any number included in brackets Orders - anything to the power of or square numbers Division Multiplication - Division and/or multiplication Addition Subtraction - Addition and/or Subtraction *Can you now try and create number sentences that equal 11?* $(2 \times 0) - (11 \times 2) - (5 \div 2) - (2 \times 2) = 11$ $60 - (2 \times 0) + 5 - (2 \times 5) - (2 \times 2) = 11$ *How do you know each of your number sentences is right?* The number sentences are correct. They are computed using BODMAS, like mine. *Can you use any decimals?* $(2.5 \times 2) + (15 \times 2) = 35$ $(3.5 \times 2) \times (2.5 \times 2) = 35$ $(4.5 \times 2) + (0.5 \times 4) = 11$	I can apply efficient mental and written strategies when solving all four operations with whole numbers. Identifying Indices within a number sentence (EL from Term One this year) I know that numbers can be positive and negative	Team designed CFA developed from proficiency scale. (PRE and POST) Work samples Quick checks Warm up Mathletics Conferencing	**T2 Weeks 1-6**	Create and write number sentences involving brackets of operation (BODMAS) that relate to real life problems Solving and Including Indices in BODMAS number sentences. BODMAS problems with increased difficulty involving multiple brackets and order of operations.
Integers I understand everyday integers and can represent them in real life contexts. **Learning Target** I can: - apply integers to create graphical representations of data. - apply integers to financial planning. - locate and plot coordinates in all four	RULES FOR INTEGERS (SIGNED NUMBERS) ADDITION + and + = + − and − = − + and − = + + and − = − SUBTRACTION ADD THE OPPOSITE! (Change the subtraction sign to an addition sign. Change the sign of the second number. Now follow the Addition rules!) MULTIPLICATION AND DIVISION + and + = + + and − = − − and − = + − and + = − *Compliments of Lois Terms* *www.loisterms.com*	I know that financial plans must include expenditure (spending) and totals. I know the x and y axis. I know how to plot and locate points in Quadrant One of a Coordinate Plane.	CFA Check-Out Task	**T1 Weeks 4-9**	To use a number line to solve addition and subtraction problems using positive and negative integers. (F) I can solve problems involving the order, addition and subtraction of positive and negative integers. EXT: I can solve multiplication and division of integers.

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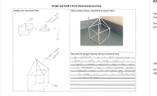
quadrants of the Cartesian plane - identify (positive and negative) integers on a number line - I understand that numbers can be positive or negative.					I can plot integers to create graphs on the cartesian plane.
Decimals Four Operations Select and apply efficient mental and written strategies to **solve problems** involving **all four operations** with decimals. **Learning Targets:** I can: - Select and justify operation required to solve worded problems involving decimals - Use algorithms to solve number sentences involving division	I can add any number with a decimal to the thousandths, using an efficient **written** method. I can subtract any number with a decimal to the thousandths, using an efficient **written** method. I can multiply a whole number by a number ending in a decimal to hundredths, using an efficient **written** method.	Select and justify operation required to solve worded problems (whole number) Use algorithms to solve number sentences involving division (whole number) Use algorithms to solve number sentences involving multiplication (whole number) Use algorithms to solve number sentences involving addition and	CFA Mini CFA's Check-In Tasks	**T2 Weeks 7-10**	Apply, investigate and justify the solutions to problems involving the four operations of decimals (backwards working). EXT: Applying written strategies to solve problems involving the multiplication of decimal by decimal to tens of thousandths. EXT: Applying written strategies to solve problems involving the division of whole numbers

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involving decimals. (Whole Number / Whole Number = Terminating decimal, Decimal by power of ten) - Use algorithms to solve number sentences involving multiplication involving decimals. (Whole number x Decimal) - Use algorithms to solve number sentences involving addition and subtraction of decimals. (Decimal and Decimal)	 I can divide any 4 digit whole number by a 1 digit number resulting in a terminating decimal, or powers of 10, using an efficient **written** method. 	subtraction (whole number)			by more than one digit to result in a decimal.
Angles I can solve problems using the properties of angles **Learning Target** I can:	I can show my knowledge of angle by: 	Estimate, measure and compare angles using degrees. Construct angles using a protractor I can - describe acute (less than 90deg), obtuse	CFA designed by the team. Check-In Tasks	**T2 Weeks 1-4**	- use properties of different quadrilaterals to find unknown angles - Corresponding angles

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- Use results to find unknown angles - Recognise and explain that every angle formed by intersecting lines has an inverse angle.	Investigating angles: - On a straight line - At a point - Vertically opposite angles	(greater than 90deg), reflex angles (greater than 180deg) and revolution (360deg) in terms of their relationship to a right angle (90deg)			
Prisms and pyramids I can construct simple prisms and pyramids **Learning Target** I can: - Use digital technologies to construct simple prisms and pyramids	I can: - construct prisms and pyramids from nets and skeletal models - Prisms: Square (cube), rectangular, triangular, pentagonal - Pyramids: Square, triangular, hexagonal - identify and draw prisms and pyramids from different rotations (birds eye, underneath and side view) AMSI: Year 6 Prisms/Pyramids: http://amsi.org.au/ESA_middle_years/Year6/Year6_md/Year6_2c.html ACARA: Year 6 At Standard Portfolio: https://acaraweb.blob.core.windows.net/curriculum/worksamples/Year_6_Mathematics_Portfolio_Satisfactory.pdf	I can recognise and name prisms and pyramids I can identify the properties of prisms and pyramids	CFA designed by the team.	**T2 Weeks 5-6**	Draw different views of prisms and solids formed from combinations of prisms
Length and area. I can solve problems involving length and area.	I can: - estimate and use formal measurements to check	I know and understand the relationship between units of measurement for length: e.g. 10mm in 1cm	Team designed CFA	**Term 2 Weeks 7-8**	Triangles, circles, non-uniform shapes (shape cut out of a shape).

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Learning Target I can: - use formulas to calculate length and area - Solve problems involving the comparison of lengths and areas using appropriate units - recognise and investigate familiar objects using concrete materials and digital technologies	- find the area of a rectangle when all lengths are whole numbers. - explain the rule for finding the area of a rectangle - find the perimeter of quadrilaterals, triangles, and various regular and irregular shapes. - explain how shapes with the same perimeter can have different areas - compare lengths and areas of various shapes - Partitions a composite shape into rectangles in order to find its area.	100cm in 1m 1000m in 1km I know the difference between perimeter and area. Understand and recognise the formulas: $A = l \times w$ $P = 2 \times (l + w)$ I can explain why the 'formulas' are reliable (reasoning).			I can find the area of a rectangle when some lengths are decimal numbers
Volume and capacity I can connect volume and capacity and their units of measurement. **Learning Target** I can: - recognise that 1ml is equivalent to 1cm^3	I understand that: - 1ml is equivalent to 1cm^3 - capacity and volume are different things - they can be related through displacement I can: - find the volume and capacity of a rectangular prism	I know: - that capacity refers to the amount an object can hold and is usually associated with liquid/gas. - commonly used capacity measurements/units: litres for milk, millilitres for medicine... - that volume refers to the amount of space occupied by an object and commonly used volume measurements are the	Team designed CFA	**Term 2 Weeks 9-10**	Calculate volumes of rectangular prisms (ACMMG160) investigating volumes of cubes and rectangular prisms and establishing and using the formula $V = l \times w \times h$ - understanding and using cubic units when interpreting and finding volumes of cubes and rectangular prisms

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		cubic centimetre and cubic metre			

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