HANGAIA TE URUPOUNAMU MŌ TĀTOU

Taumata 2 (Tau 3)
Tau me te Taurangi

Teacher Booklet
ODD YEARS

Rapanga 1 (Whole class option)	Whakaoti ēnei whārite.He aha ou kitenga? 30 + 10 = 26 + 20 = 54 + 30 = 39 - 10 99 - 10 =
Whakaaro Matua Pāngarau ***Big Ideas***	Our number system is based on groupings of ten or base ten. Groupings of ones, tens, hundreds, and thousands can be taken apart in different ways. Number operations and strategies to solve number operations can be recorded using words, numbers, diagrams, and symbols.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-4:** Know how many tenths, tens, hundreds, and thousands are in whole numbers. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Add and subtract groupings of tens. Represent equations on an empty number line. Use place value to solve addition/subtraction problems.
Reo Matatini Pāngarau ***Mathematical Language***	Tens, ones, hundreds, place value, face value, total value, base ten.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies that focus on the place value and what happens to the tens and ones. Use an empty number line to record adding in tens or larger numbers. Reinforce the language and concepts of nested place value (e.g., Sixty is 6 tens and twenty is 2 tens and 6 tens and 2 tens makes 8 tens or eighty). **Connect:** Ask students to solve the following and use place value language to describe their solutions: 300 + 100 = 360 + 100 = 360 + 20 = 360 + 300 = 360 + 320 =
Kōrero Tautoko ***Teacher Notes***	• Before you launch the task, write 147 on the board. Ask students to identify the number and describe it in as many ways as they can. Highlight the place value, face value and total value in the number. Complete this activity as a warm-up throughout the unit of work and use increase the numbers up to 10 000. • Have concrete material available if needed for students to select (e.g., arrow cards, money in $10 notes and ones, and 100s boards). • Explicitly press for place value and the face and total value. • Expect children to represent their reasoning on an empty number line and track the jumps in either 10's or bigger numbers. If the students do not use these introduce as a representation. • Sets of tens (and tens of tens) can be perceived as single entities e.g. 30 is 3 tens; When we add 40 we are adding 4 tens; 500 is 5 hundreds. Make explicit 30 + 10 is 3 tens plus 1 ten. This highlights the nested nature of place value. Nested place value is the idea that place value units are included in other place value units, for example, tens are within hundreds, and hundreds are within thousands.
Ngohe whakaharatau ***Independent Tasks***	Solve the following problems: 40 + 20 = 36 + 20 = 55 + 40 = 78 + 10 = 89 – 20 = What patterns do you notice?

Ngā matapae ***Anticipations***	

Rapanga 2	He aha ou kitenga? 54 + 35 = 126 + 42 = 39 - 15 = 265 - 33 = Whakaatu ou whakaaro ki ngā wharite me tētahi rārangi tau.
Whakaaro Matua Pāngarau ***Big Ideas***	Our number system is based on groupings of ten or base ten. Groupings of ones, tens, hundreds, and thousands can be taken apart in different ways. Number operations and strategies to solve number operations can be recorded using words, numbers, diagrams, and symbols.
Hononga Marautanga ***Curriculum Links***	**NA2-1**: Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages
Whāinga Ako ***Learning Outcomes***	Add and subtract ones, tens, and hundreds. Name the place, face, and total value of numbers. Represent reasoning using a number line and through notation.
Reo Matatini Pāngarau ***Mathematical Language***	Tens, ones, hundreds, place value, face value, total value
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Highlight student solution strategies where place value was used. Model how this can be linked to a place value house. **Connect:** Ask students to explain how place value could be used to solve these equations: 115 + 62 = 254 + 34 =

Kōrero Tautoko ***Teacher Notes***	• Before you launch the task, write 654 on the board. Ask students to identify the number and describe it in as many ways as they can. Highlight the place value, face value and total value in the number. Complete this activity as a warm-up throughout the unit of work and use increase the numbers up to 10 000. • Have concrete material available if needed for students to select (e.g., arrow cards, pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Explicitly press for place value and the face and total value, also press for what happens to the ones when you add a ten to a number. • Expect children to represent their reasoning on an empty number line and using equations. • Sets of tens (and tens of tens) can be perceived as single entities e.g. 30 is 3 tens; When we add 40 we are adding 4 tens; 500 is 5 hundreds. Make explicit 30 + 10 is 3 tens plus 1 ten. Highlight the nested nature of place value. Nested place value is the idea that place value units are included in other place value units, for example, tens are within hundreds, and hundreds are within thousands.
Ngohe whakaharatau ***Independent Tasks***	Solve these problems: 33 + 11 = 23 + 25 = 442 + 35 = 48 – 16 = 56 – 12 = 168 – 25 =
Ngā matapae ***Anticipations***	

Rapanga 3	56 ngā a Mala. I hoatu 24 ki tōna tūngane. E hia āna māpere inaianei? 168 ngā māpere a Mala. I hoatu 31 ki tōna tūngane. E hia āna māpere inaianei? 399 ngā māpere a Mala. I hoatu 73 ki tōna tūngane. E hia āna māpere inaianei?
Whakaaro Matua Pāngarau ***Big Ideas***	Our number system is based on groupings of ten or base ten. Groupings of ones, tens, hundreds, and thousands can be taken apart in different ways. Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. Number operations and strategies to solve number operations can be recorded using words, numbers, diagrams, and symbols.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Use place value to solve subtraction problems. Represent reasoning using a number line and through notation
Reo Matatini Pāngarau ***Mathematical Language***	Tens, ones, hundreds, subtract
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies that have used place value: 168 = 100 + 60 + 8 so to take away 31 … 100 – 0 = 100 60 – 30 = 30 8 – 1 = 7 168 – 31 = 137 or

	168 – 30 = 138 138 – 1 = 137 Ask students to represent or model how to represent using both equations and an empty number line **Connect:** Ask students to explain how you would solve the following equations using place value: 78 – 34 = 165 – 42 =
Kōrero Tautoko ***Teacher Notes***	• Have concrete material available if needed for students to select (e.g., arrow cards, pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Expect students to represent their reasoning on an empty number line and track the jumps in either 10's or bigger numbers. If the students do not use these introduce their use as a representation. • Also expect students to use equations to represent their reasoning. Model this if students do not use equations. • Notice students who are subtracting by using tens and ones
Ngohe whakaharatau ***Independent Tasks***	May-Lee had 88 beads. She made a necklace for her cousin and used 56 beads. How many beads does May-Lee have left over? Beth had 237 beads. She made a necklace for her cousin and used 21 beads. How many beads does Beth have left over? Dakota had 456 beads. She made a necklace for her cousin and used 32 beads. How many beads does Dakota have left over?
Ngā matapae ***Anticipations***	

Rapanga 4	56 ngā piere Kahurangi, 29 ngā piere kowhai a Kataraina. E hia te katoa? 227 ngā piere Kahurangi, 25 ngā piere kowhai a Kataraina. E hia te katoa? 39 ngā piere Kahurangi, 138 ngā piere kowhai a Kataraina. E hia te katoa?
Whakaaro Matua Pāngarau ***Big Ideas***	Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Decompose and recompose numbers up to 500. Use place value to solve addition problems. Use bridging by decades to solve addition problems. Use equivalence and compensation to solve addition problems. Represent reasoning using a number line and through notation.
Reo Matatini Pāngarau ***Mathematical Language***	Tens, ones, hundreds, add, subtract.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies that have bridged across a decade or used equivalence and compensation. If no student solves the task this way, then introduce either solution strategy as an alternative model previously used by other students. Use multiple representations to represent student solution strategies including an empty number line, equations, and tens frames. *Bridging across tens* 39 + 138 = 138 – 100 = 38 39 + 1 = 40 40 + 30 = 70 70 + 7 = 77 100 + 77 = 177 *Equivalence and compensation* 39 + 138 = 39 + 140 = 179 79 – 2 = 177 **Connect:** Ask students to describe how you would solve the following equations using either bridging across a decade or equivalence and compensation: 58 + 119 = 455 + 27 =
Kōrero Tautoko ***Teacher Notes***	• Have concrete material available if needed for students to select (e.g., arrow cards, pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Notice students who are adding the numbers by bridging to the closest decade. • Notice students who are using equivalence and compensation. • Expect students to represent using an empty number line and equations.
Ngohe whakaharatau ***Independent Tasks***	Jack and Jill collected acorns in the playground. Jack has 65 acorns and Jill has 27. How many acorns do they have altogether? Dallas and Vegas collected acorns in the playground. Dallas has 118 acorns and Vegas has 46. How many acorns do they have altogether? Roman and Elias collected acorns in the playground. Roman had 59 acorns and Elias had 238. How many acorns do they have altogether?

Ngā matapae ***Anticipations***	

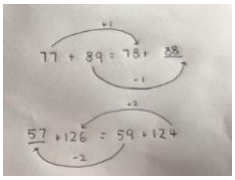
Rapanga 5	I tiki 56 ngā ārani a Semi. I hoatu 28 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 182 ngā ārani a Semi. I hoatu 69 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 174 ngā ārani a Semi. I hoatu e 137 ki tōna Māmā. E hia ngā ārani a Semi inaianei?
Whakaaro Matua Pāngarau ***Big Ideas***	Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Decompose and recompose numbers up to 500. Use subtracting in parts to solve subtraction problems. Use equivalence and compensation to solve subtraction problems. Represent reasoning using a number line and through notation.
Reo Matatini Pāngarau ***Mathematical Language***	Hundreds, tens, ones, add, subtract.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Notice and select student solution strategies where they have subtracted in parts or used equivalence and compensation. Represent this using equations and on an empty number line. *Subtraction in parts* 56 – 28 = 56 – 20 = 36 36 – 6 = 30 30 – 2 = 28 *Equivalence and compensation* 56 – 28 = 56 – 30 = 26 26 + 2 = 28 **Connect:** Ask students to describe how you would solve the following equations using either subtracting in parts or equivalence and compensation: 92 – 38 = 186 – 129 = Use an empty line and equations to represent their ideas.
Kōrero Tautoko ***Teacher Notes***	Have concrete material available if needed for students to select (e.g., arrow cards, pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Students may either subtract in parts or use equivalence and compensation (take away more and then adjust proportionally). • Students may solve using inverse relationships. Use this to highlight the relationship between addition and subtraction. • Expect students to represent using equations and empty number lines.
Ngohe whakaharatau ***Independent Tasks***	Ana had 51 loom bands. She used 27 to make a bracelet for her friend. How many loom bands does she have left? Tina has 148 loom bands. She used 39 to make a bracelet for her friend. How many loom bands does she have left? Sam has 152 loom bands. She used 126 to make a bracelet for her friend. How many loom bands does she have left?
Ngā matapae ***Anticipations***	

Rapanga 6	24 ngā āporo a Whaea Ana. I tiki a Pita i ētahi āporo anō. 51 ngā āporo a Whaea Ana inaianei. E hia ngā aporo i tiki a Pita? 44 ngā āporo a Whaea Ana. I tiki a Pita i ētahi āporo anō. 172 ngā āporo a Whaea Ana inaianei. E hia ngā aporo i tiki a Pita? 116 ngā āporo a Whaea Ana. I tiki a Pita i ētahi āporo anō. 145 ngā āporo a Whaea Ana inaianei. E hia ngā aporo i tiki a Pita?
Whakaaro Matua Pāngarau ***Big Ideas***	Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-4:** Know how many ones, tens, and hundreds are in whole numbers to at least 1000. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Decompose and recompose numbers up to 500. Use subtracting in parts to solve subtraction problems. Use equivalence and compensation to solve subtraction problems. Use the inverse relationship of addition and subtraction to solve problems. Represent reasoning using a number line and through notation.
Reo Matatini Pāngarau ***Mathematical Language***	Hundred, tens, ones, add, subtract, inverse relationship.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select a student solution strategy which uses addition and a different one which has used subtraction. Facilitate students to compare the solution strategies and use this to highlight the inverse relationship between addition and subtraction. If no student solves the task this way, then introduce either solution strategy as an alternative model previously used by other students. **Connect:** Ask students to represent the following situation using at least two different equations and operations: Ana had 61 mandarins. She keeps some mandarins but gives 16 to her neighbour. How many mandarins did Ana keep? Record as 61 – 16 = Or 16 + __ = 61 Then use prompt "if you know that 61 – 16 = 45, what other number sentences could you write?" Ask students to discuss what they notice and make a conjecture.
Kōrero Tautoko ***Teacher Notes***	• Launch these tasks by asking students to act out the scenario so that they can access the structure of the tasks. • Have concrete material available if needed for students to select (e.g., pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Students may draw on the inverse and solve using addition or subtraction. • Focus on supporting students to represent using equations and an empty number line to solve the tasks.
Ngohe whakaharatau ***Independent Tasks***	Uncle had 22 feijoas in one bag and 14 feijoas in another bag. How many feijoas does uncle have altogether? Mona picked 54 strawberries and her cousin picked some more. Now they have 92 strawberries. How many did cousin pick? Mere has 37 pink beads in one bag. She also has some yellow beads in another bag. Altogether she has 76 beads. How many yellow beads does she have?
Ngā matapae ***Anticipations***	

Rapanga 7	Kimihia te tau e ngaro ana? 18 + 6 = _ + 5 35 + 19 = 36 + _ 19 + _ = 17 + 25 _ + 86 = 19 + 85
Whakaaro Matua Pāngarau ***Big Ideas***	Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-6:** Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Explain and justify relationships between numbers in an equation. Solve equivalence problems and explain and justify the solutions.
Reo Matatini Pāngarau ***Mathematical Language***	Equal sign, relationship, difference, add, subtract.
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Allow students to share misconceptions related to the equal sign (e.g., 18 + 6 = 24 + 5) to position them to engage in argumentation. Select students to share who have used a relational strategy to find the missing number. If no students use a relational strategy, introduce this to them using arrows and explanations.

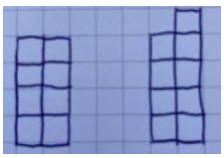
	 **Connect:** Ask the students to find the missing numbers by looking for the relationship across the equal sign and show this using arrows. 77 + 89 = 78 + __ __ + 126 = 59 + 124
Kōrero Tautoko ***Teacher Notes***	• Before you launch the task, ask the students to discuss these true and false number sentences and justify their thinking: 188 = 188 99 + 255 = 256 + 99 78 = 88 – 10 29 + 30 = 59 + 8 28 + 26 = 29 + 25 250 = 261 Use true and false and open number sentence tasks as a warm up through-out the year. • Students may begin by demonstrating misconceptions. This can be used to position students to agree/disagree. • Some students may work out one side and then the other to equal the same number. However, the key focus should be on positioning students to use the relationships across the equal sign. • Draw attention to students who use relational types of thinking and notate the number sentences with arrows to highlight this.
Ngohe whakaharatau ***Independent Tasks***	Solve the following problems: 126 + 57 = 122 – 72 = 74 + 168 = 137 + 85 = 192 – 65 =
Ngā matapae ***Anticipations***	

Rapanga 8	Kimihia te tau e ngaro ana 23 - 17 = _ - 15 46 - 28 = 45 - _ _ - 36 = 71 - 26 143 - _ = 43 - 29
Whakaaro Matua Pāngarau ***Big Ideas***	Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-6:** Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Explain and justify relationships between numbers in an equation. Solve equivalence problems and explain and justify the solutions.
Reo Matatini Pāngarau ***Mathematical Language***	Equal sign, relationship, difference, add, subtract.
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select students to share who have used a relational strategy to find the missing number. Notate the equations using arrows. **Connect:** Ask the students to find the missing numbers by looking for the relationship across the equal sign and show this using arrows. 34 – 17 = 35 – __ __ – 89 = 126 – 99

Kōrero Tautoko ***Teacher Notes***	• Note that the order of directionality is different between addition and subtraction and students may adjust as you do with addition and end up with an incorrect solution such as 23 – 17 = 25 – 15. Facilitate a discussion with the students to notice the difference between open number sentences with addition and subtraction (e.g., addition involves an adjustment of +1, -1 while subtraction involves an adjustment of +1, +1, or -1, -1). • Some students may work out one side and then the other to equal the same number. However, the key focus should be on positioning students to use the relationships across the equal sign. • Draw attention to students who use relational types of thinking and notate the number sentences with arrows to highlight this.
Ngohe whakaharatau ***Independent Tasks***	Find the missing numbers: 18 + 15 = __ + 16 __ + 27 = 14 + 29 123 + __ = 133 + 18 64 + 38 = 62 + __ 157 + 178 = __ + 168 Use arrows to show your thinking.
Ngā matapae ***Anticipations***	

Rapanga 9 (Whole class option)	E ai ki a Jonty “Ina tāpiri ngā nama e rua kare e kore ka rite te whakautu.” Wānangahia ki waenganui tētahi rōpū mēnā ka whakaae, kare i te whakaae rānei i te whakapae a Jonty. Ka taea e koe te hāpono i ngā tau katoa? Ka tika te rautaki a Jonty mot e tangohia, te whakarea, te whakawehe hoki?
Whakaaro Matua Pāngarau ***Big Ideas***	There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-6:** Record and interpret additive and simple multiplicative strategies, using words, diagrams, and symbols, with an understanding of equality. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Explain and justify the commutative property. Use different representations including concrete material, representations, and notation to represent a conjecture
Reo Matatini Pāngarau ***Mathematical Language***	Commutative property, conjecture, proof, generalisation, addition, subtraction, multiplication, division.
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select groups that have built concrete models to share their generalisations. Highlight to students that letters or symbols can be used in maths to represent any numbers. **Generalise:** Can you represent the conjectures that you have made using a statement, a diagram and a number sentence (e.g., $\Delta + \square = \square + \Delta$)?

Kōrero Tautoko ***Teacher Notes***	• Students may begin by testing different examples with numbers and different types of numbers (e.g., large, small, fractions). After they have explored multiple examples, prompt them by 25 asking whether they can prove it would work with every number. • Have appropriate equipment for students to build concrete models to prove their conjectures (e.g., counters, grid paper, peg boards). • Look for students drawing on the commutative property and understanding that it works for addition and multiplication but not for subtraction and division. • Students may generate counter examples to prove the commutative property does not apply to subtraction or division. Students may also generate special cases (e.g., 5 – 5 = 5 – 5).
Ngohe whakaharatau ***Independent Tasks***	Find the missing numbers: 46 – 18 = __ – 16 67 – 49 = __ – 48 __ – 25 = 63 – 15 193 – __ = 93 – 29
Ngā matapae ***Anticipations***	

Rapanga 10 (Whole class option)	He aha tō mōhiotanga mo ngā taukehe me ngā taurua? Whakamahia ngā taputapu kia hanga tauira o ngā taukehe me ngā taurua. He aha ngā tauira e puta mai? Ka tika ēnei tauira i ngā wā katoa?
Whakaaro Matua Pāngarau ***Big Ideas***	There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Relationships can be described and generalisations made for mathematical situations that have numbers or objects that repeat or grow in predictable ways.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols.
Whāinga Ako ***Learning Outcomes***	Explain the structure of odd and even numbers. Use concrete material to justify conjectures about odd and even numbers. Develop definitions of odd and even numbers.
Reo Matatini Pāngarau ***Mathematical Language***	Odd numbers, even numbers, generalisation, patterns
Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies that use a concrete model that can be used to justify the definition of an odd or even number. Ask students to develop a definition and consider whether this will always work for every odd number or every even number.  Model of even and odd numbers **Connect:** Ask students to use their definitions to see whether the following numbers are odd or even: 312 544 2867 1002 9836 2345 Support students to notice that the final digit determines the oddness or evenness of the number and highlight this to all students.

Kōrero Tautoko ***Teacher Notes***	• After students have shared what they know about odd and even numbers, record all of the statements on the board. Ask the students to use the concrete material to build models of odd and even numbers to see whether the statements work. • Ask the students to use different types of the concrete material to construct the models to support them to begin thinking about the structure of the numbers. • Have available to use: grid paper, multi-link cubes, counters, peg-boards, and ice block sticks. • Support students to develop correct mathematical definitions (e.g., an even number can be divided by two and you will end up with the same whole number in both groups. When you divide an odd number by two you end up with one left over.
Ngohe whakaharatau ***Independent Tasks***	Solve the following problems: 27 + 125 = 156 – ___ = 13 ___ + 72 = 188 13 + 155 = 50 = ____ + ____ 46 = _____ + _____ 52 + 19 = 36 + 152 =
Ngā matapae ***Anticipations***	

Rapanga 11 (Optional task)	Whakaoti ēnei: 56 - 37 = 183 - 138= 54 + 37 = 139 + 46 =
Whakaaro Matua Pāngarau ***Big Ideas***	Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Use subtracting in parts to solve subtraction problems. Use place value to solve addition problems. Use bridging to the nearest decade to solve addition problems Use equivalence and compensation to solve subtraction and addition problems. Represent reasoning using a number line and through notation.
Reo Matatini Pāngarau ***Mathematical Language***	Tens, ones, add, subtract.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies where they have subtracted in parts, used place value to add or used equivalence and compensation. **Connect:** Ask students to describe how you would solve the following equations using place value, bridging to the nearest decade, subtraction in parts or equivalence and compensation: 73 – 24 = 39 + 163 =
Kōrero Tautoko ***Teacher Notes***	• Have concrete material available if needed for students to select (e.g., pre-printed tens frames, money in $10 notes and ones, and 100s boards). • Notice students who are adding the numbers by bridging to the closest decade. • Notice students who are using equivalence and compensation. • Expect students to represent using the empty number line and equations.
Ngohe whakaharatau ***Independent Tasks***	Solve the problems below: 63 – 19 = 45 – 26 = 82 – 57 = 43 + 118 = 112 + 98 = Use an empty number line and equations to show how you have solved them.
Ngā matapae ***Anticipations***	

Rapanga 12 (Optional task)	Whakaoti ēnei: 59 + 64 = 657 + 35 = 94 - 37 = 153 - 49 = 121 - 68 =
Whakaaro Matua Pāngarau ***Big Ideas***	Numbers are used to name specific quantities. Numbers can be decomposed into parts in an infinite number of ways without the quantity changing. There are arithmetic properties that characterise addition and multiplication as operations. These are the commutative, associative, distributive, and identity properties. Addition and subtraction and multiplication and division have an inverse relationship. Equations show relationships of equality between parts on either side of the equal sign. The properties of equality are: If the same real number is added or subtracted to both sides of an equation, equality is maintained; If both sides of an equation are multiplied or divided by the same real number (not dividing by 0), equality is maintained; Two quantities equal to the same third quantity are equal to each other.
Hononga Marautanga ***Curriculum Links***	**NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-6:** Communicate and interpret simple additive strategies using words, diagrams (pictures) and symbols. **NA2-7:** Generalise that whole numbers can be partitioned in many ways. **NA3-1:** Use a range of additive and simple multiplicative strategies with whole numbers, fractions, decimals, and percentages. **NA3-7:** Generalise the properties of addition and subtraction with whole numbers.
Whāinga Ako ***Learning Outcomes***	Use subtracting in parts to solve subtraction problems. Use equivalence and compensation to solve subtraction problems. Represent reasoning using a number line and through notatio
Reo Matatini Pāngarau ***Mathematical Language***	Hundred, tens, ones, add, subtract.

Tohatoha Whakaaro/Wā Hononga ***Sharing back/ Connect***	Select student solution strategies where they have subtracted in parts or used equivalence and compensation. Represent this with equations and on an empty number line. **Connect:** Ask students to describe how you would solve the following equations using either subtraction in parts or equivalence and compensation: 165 – 59 = 113 – 87 =
Kōrero Tautoko ***Teacher Notes***	• Provide materials to help students who need it access the maths. • Notice students who are adding the numbers by bridging to the closest decade. • Notice students who are using rounding and compensating. • Expect students to represent using the empty number line and equations. Also have printed or empty tens frames available for students to model their solution strategy.
Ngohe whakaharatau ***Independent Tasks***	Select one or more of the following assessment tasks (attached at the end of the document) as the independent activity: N1A: Addition and Subtraction Problems to solve. N1AB: Addition and Subtraction Problems to solve (parallel task). N3A: Patterns in number sentences. N3AB: Patterns in number sentences (parallel task).
Ngā matapae ***Anticipations***	
