HANGAIA TE URUPOUNAMU MŌ TĀTOU

Taumata 1 (Tau 2)
Tau me te Taurangi

Teacher Booklet
ODD YEARS

Rapanga 1	Whiriwhirihia tētahi tau i waenga 11-19. Tohua te tau mā te anga tekau. Tuhia te rerenga tau e hono ai. Whiriwhirihia tētahi tau i waenga 20-30. Tohua te tau mā te anga tekau. Tuhia te rerenga tau e hono ai. Tuhia ngā rerenga tāpiri me ngā rerenga tango e hono ai. Tāngia te anga tekau.
Whakaaro Matua Pāngarau *Big Ideas*	Quantity is an attribute of a set of objects and we use numbers (represented by words and symbols) to name specific quantities. A quantity (whole) can be decomposed into different parts, the parts can be composed to form the whole
Hononga Marautanga *Curriculum Links*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions **NA1-3:** Know groupings with five, within ten, and with ten. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures **NA1-5:** Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. **NA2-3:** Know the basic addition and subtraction facts
Whāinga Ako *Learning Outcomes*	• Represent visual and symbolic patterns for the numbers between ten and thirty. • Represent and explain thinking using pictures, numbers, and symbols.
Reo Matatini Pāngarau *Mathematical Language*	Number words, add, subtract, equation.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share and record the number sentences generated through use of the tens frames and to draw the tens frames that match. Connect: Ask students to discuss any patterns in the number sentences: "What do you notice? Can you see any patterns in these number sentences?"

Kōrero Tautoko *Teacher Notes*	• Before you launch the task, provide students with a variety of pre-printed tens frames to find combinations. The focus should be on finding combinations without counting so they are using the structure of the number representation. Ask them to find all the combinations to ten and record the number sentences that match the combinations to 10 using an addition sign. • Provide students with multiple tens frames. • Provide markers/pens to students to draw and record their number sentences and the tens frame. • Ask students to re-draw the tens frame until they have an accurate representation. • Notice their representations - are they showing an understanding of groupings of tens and one in place value? Are they using the addition and subtraction sign accurately? 10 + 10 + 3, if 2 tens = 20, then 20 + 3 = 23. • During the connect, support students to notice patterns like the commutative property (e.g., 6 + 19 = 19 + 6), inverse property (e.g., if 6 + 19 = 25 then 25 – 6 = 19 or 25 – 19 = 6).
Ngohe whakaharatau *Independent Tasks*	Choose a number between 20 – 30 and draw tens frames that would make the number and write the matching number sentences. Find different ways to make the number. Draw the tens frames and record the matching number sentences
Ngā matapae *Anticipations*	

Rapanga 2 (Whole Class Option)	I kohia a Malakai 30 ngā rau ki ngā pēke e 2. He aha ngā huinga rerekē ki ngā pēke e rua? Ka taea te tā me te tuhi ngā rerenga tau?
Whakaaro Matua Pāngarau *Big Ideas*	Quantity is an attribute of a set of objects and we use numbers (represented by words and symbols) to name specific quantities. A quantity (whole) can be decomposed into different parts, the parts can be composed to form the whole. 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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA1-5:** Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. **NA2-3:** Know the basic addition and subtraction facts.
Whāinga Ako *Learning Outcomes*	• Split and recombine numbers to make groupings to 30. • Use patterns and relationships to solve problems.
Reo Matatini Pāngarau *Mathematical Language*	Number words, add, subtract, equation, equal sign.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students who have used patterns to find different possibilities to share their solution strategies. Record these using both pictorial representations (tens frames and equations). Connect: Select a student who has developed a systematic way to find all possibilities and ask students to use that way to find all the possibilities for 35 marbles. If no students develop a systematic way then use the following example… Meleana has worked out a way to find all the different

	combinations. She begins by putting 35 marbles in one bag and none in the other. Show using tens frames and record 35 + 0 = 35 Then she knows that the next one will be 34 marbles in one bag and one marble in the other. Show using tens frames and record 34 + 1 = 35 Can you use Meleana's idea to find all of the different combinations?
Kōrero Tautoko *Teacher Notes*	• Provide students with bags of 30 counters and or other materials (multi-link cubes, etc) to represent marbles. • Provide markers/pens to students to draw and record their number sentences. • Notice their representations - are they showing an understanding of groupings of ten and place value? Are they using the addition sign accurately e.g. 22 + 8 = 30 • Highlight different combinations during sharing back.
Ngohe whakaharatau *Independent Tasks*	Litea has 26 leaves and two bags. What are the different ways that she could put the leaves into the bags? Can you record your ideas using drawings and number sentences?
Ngā matapae *Anticipations*	

Rapanga 3	19 ngā motoka tā Sita, i whiwhi e 7 anō? E hia āna motoka inaianei? 17 ngā motoka tā Sita, i whiwhi 19 anō? E hia āna motoka inaianei? E 8 ngā motoka tā Sita, i whiwhi e 15 anō? E hia āna motoka inaianei? 15 ngā motoka tā Sita, i whiwhi e 28 anō? E hia āna motoka 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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA1-5:** Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. **NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-3:** Know the basic addition and subtraction facts
Whāinga Ako *Learning Outcomes*	• Use counting on to solve addition problems. • Use bridging decades to solve addition problems. • Use equivalence and compensation to solve addition problems. • Represent and explain thinking using pictures, numbers, and symbols
Reo Matatini Pāngarau *Mathematical Language*	Add

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share who are using bridging to a decade or equivalence and compensation to solve the problem. Record this on the board. If no students are using bridging to a decade or equivalence and compensation, then model as another way the teacher has seen used previously. Bridging to a decade 19 + 1 = 20 20 + 6 = 26 Equivalence and compensation (19 + 1) + 7 = 27 27 – 1 = 26 Connect Ask students to describe how you would solve the following problems using bridging to a decade or equivalence and compensation: 29 + 16 = 18 + 39 = Represent using an empty number line and equations.
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds board). • Expect to students to draw/record their number sentences. • Notice if students see patterns in each set of problems.
Ngohe whakaharatau *Independent Tasks*	Mikayla has 12 loom bands and makes another 9 loom bands. How many loom bands does Mikayla have? Wiremu has 19 loom bands and makes another 12 loom bands. How many loom bands does Wiremu have? Tim has 13 loom bands and makes another 8 loom bands. How many loom bands does Tim have? Nevaeh has 18 loom bands and makes another 13 loom bands. How many loom bands does Nevaeh have? 14 + 8 = 18 + 14 = 8 + 19 = 19 + 18 =

Ngā matapae *Anticipations*	
Ngā matapae *Anticipations*	

Rapanga 4	Whakaoti ēnei: 19+6= 16+19= 29+16= 116+29=
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*	NA1-1: Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. NA1-2: Know the forward and backward counting sequences of whole numbers to 100. NA1-4: Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. NA1-5: Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. 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.
Whāinga Ako *Learning Outcomes*	• Use counting on to solve addition problems. • Use place value to solve addition problems. • Use bridging decades to solve addition problems. • Use equivalence and compensation to solve addition problems. • Represent and explain thinking using pictures, numbers, and symbols
Reo Matatini Pāngarau *Mathematical Language*	Add, tens, ones, equation, place value.

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students who are using the patterns and relationships to solve the problems (e.g., doubles, drawing on the previous solution). Have pre-printed tens frames available as a resource to show the representation. Connect Present as a string with one equation written at a time: 15 + 13 = 23 + 15 = 55 + 23 = 255 + 23 = What patterns did you use to help you solve these equations?
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds board). • Expect to students to draw/record their number sentences. • Notice if students see patterns in each set of problems.
Ngohe whakaharatau *Independent Tasks*	Look for patterns and use these to help you solve the problems below: 4 + 5 = 14 + 5 = 14 + 15 = 24 + 25= 4 + 3 = 13 + 4 = 14 + 13 = 23 + 24 = What patterns did you notice as you solved these problems?
Ngā matapae *Anticipations*	

Rapanga 5	
	17 ngā māpere a Mala. I hoatu e 8 ki tōna tūngane. E hia āna māpere inaianei? 27 ngā māpere a Mala. I hoatu e 8 ki tōna tūngane. E hia āna māpere inaianei? 27 ngā māpere a Mala. I hoatu e 18 ki tōna tūngane. E hia āna māpere inaianei? 24 ngā māpere a Mala. I hoatu e 15 ki tōna tūngane. E hia āna māpere inaianei? 44 ngā māpere a Mala. I hoatu e 25 ki tōna tūngane. E hia āna māpere 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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-3:** Know the basic addition and subtraction facts. **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.
Whāinga Ako *Learning Outcomes*	• Use bridging decades to solve subtraction problems. • Use equivalence and compensation to solve subtraction. • Explain and represent solution strategies using materials, words, pictures, empty number lines and symbols.

14

Reo Matatini Pāngarau *Mathematical Language*	Tens, ones, add, subtract.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Notice and select student solution strategies where they have subtracted by bridging decades or used equivalence and compensation. Represent this using equations and with tens frames. Bridging decades 17 – 8 = 17 – 7 = 10 10 – 1 = 9 Equivalence and compensation 17 – 8 = 17 – 10 = 7 7 + 2 = 9 If no students are using bridging to decades or equivalence and compensation, then model as another way a student has used previously. Connect: Ask students to describe how you would solve the following problems using bridging to decades and/or equivalence and compensation: 35 – 16 = 44 – 29 =
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds board). • Expect to students to draw/record their number sentences. Model how to represent this on an empty number line. • Notice if students use patterns to help them solve the problems.

Ngohe whakaharatau *Independent Tasks*	Marlon has 16 Pokemon cards. He gives his friend 7 cards. How many cards does he have now? Nita has 26 Pokemon cards. She gives her friend 17 cards. How many cards does she have now? Tevita has 24 Pokemon cards. He gives his friend 15 cards. How many cards does he have now? Sara has 44 Pokemon cards. She gives her friend 25 cards. How many cards does she have now? $15 - 6 =$
Ngā matapae *Anticipations*	

Rapanga 6	Whakaoti ēnei 25-8= 45-18= 32-7= 52-17=
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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-3:** Know the basic addition and subtraction facts. **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.
Whāinga Ako *Learning Outcomes*	• Use bridging decades to solve subtraction problems. • Use equivalence and compensation to solve subtraction problems. • Explain and represent solution strategies using materials, words, pictures, empty number lines and symbols.
Reo Matatini Pāngarau *Mathematical Language*	Tens, ones, add, subtract.

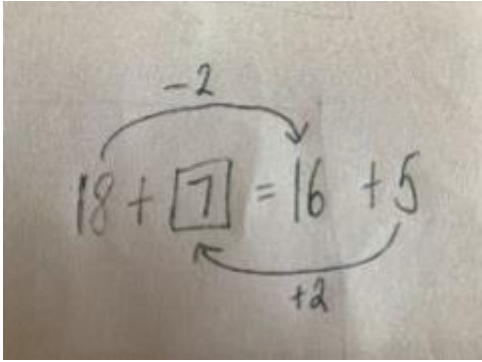|	
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select student solution strategies where they have bridged decades or used equivalence and compensation. Represent this using equations and with tens frames. Select students to share who use patterns between the first and second number sentence to help them solve the second problem. Connect Present as a string with one equation written at a time: 34 – 8 = 44 – 18 = 154 – 28 = What patterns did you use to help you solve these equations?
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds board). • Expect to students to draw/record their number sentences. • Notice if students use patterns to help them solve the problems.
Ngohe whakaharatau *Independent Tasks*	Solve these problems. Look for patterns that will help you solve them. 16 – 9 = 36 – 9 = 15 – 8 = 35 – 18 = 11 – 6 = 121 – 16 = 24 – 7 = 134 – 17 = What patterns did you notice? How did they help you?
Ngā matapae *Anticipations*	

Rapanga 7 (Whole Class Option)	He mahi takirua. Wānangahia ēnei, whiriwhirihia ko ēhea ngā mea tika, ko ēhea ngā mea hē. 99=102 14+9=23+6 25=12+13 16+18=15+19 13-8=14-9 24-16=24-16 1002=1002 Whakamāramahia he aha ngā take ka tika, ka hē ēnei.
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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **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.
Whāinga Ako *Learning Outcomes*	• Explain and justify relationships between numbers in an equation. • Write statements of equivalence in words and using notation. • Solve equivalence problems and explain and justify the solutions.
Reo Matatini Pāngarau *Mathematical Language*	Equal sign, relationship, same, different.

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Allow students to share misconceptions related to the equal sign to position them to engage in argumentation. Select students to share who have used patterns and relationships to recognise equivalence. Connect: Ask students to write their own true and false number sentences. Note students who use the equal sign flexibly.
Kōrero Tautoko *Teacher Notes*	• Ensure that students understand what true and false means. Introduce notation of not equal ($\neq$) for the number sentences that they think are false. • Students may begin by demonstrating misconceptions (14 + 9 = 23 + 6 is true because 14 + 9 = 23). This can be used to position students to agree/disagree. • Teacher to notice students who are able to accept the use of the equals sign to show balance/relationship. • Use arrows and notation to show relationships on the equations to the students.
Ngohe whakaharatau *Independent Tasks*	• Write your own set of true and false number sentences. • Give your true and false number sentences to your classmates to solve. • Make sure you ask them to explain and justify why they think they are true or false and see if you agree!
Ngā matapae *Anticipations*	

Rapanga 8	Kimihia ngā tau e ngaro ana 17+6=_+5 24+19=26+_ 16+_=17+28 _+37=56+39
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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **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
Whāinga Ako *Learning Outcomes*	• Explain and justify relationships between numbers in an equation. • Write statements of equivalence in words and using notation. • Solve equivalence problems and explain and justify the solutions
Reo Matatini Pāngarau *Mathematical Language*	Equal sign, relationship, same, difference, add, subtract.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Allow students to share misconceptions related to the equal sign (e.g., 17 + 6 = 23 + 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.

$68 + 37 = \_\_ + 39$
$\_\_ + 118 = 125 + 119$

Kōrero Tautoko *Teacher Notes*	• 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 (shown above).
Ngohe whakaharatau *Independent Tasks*	Find the missing number $33 + 9 = \_\_ + 8$ $45 + 17 = 46 + \_\_$ $\_\_ + 26 = 57 + 28$ $117 + \_\_ = 127 + 16$
Ngā matapae *Anticipations*	

Rapanga 9	Kimihia ngā tau e ngaro ana 13-8=_-7 21-17=20-_ 23-_=24-6 _-38=62-39
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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **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
Whāinga Ako *Learning Outcomes*	• Explain and justify relationships between numbers in an equation. • Write statements of equivalence in words and using notation. • Solve equivalence problems and explain and justify the solutions.
Reo Matatini Pāngarau *Mathematical Language*	Equal sign, relationship, same, different.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share who have used a relational strategy to find the missing number. If no students use a relational strategy, introduce this again 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. 33 – 18 = __ – 19 44 – __ = 42 – 27

Kōrero Tautoko *Teacher Notes*	• Present each number sentence one by one and ask students to share back before introducing the next one. • Students may begin by demonstrating misconceptions. This can be used to position students to agree/disagree. • 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 $13 - 8 = 14 - 7$. 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 (shown above).
Ngohe whakaharatau *Independent Tasks*	Find the missing numbers: $12 - 5 = 10 - \_\_$ $25 - 17 = \_\_ - 19$ $34 - \_\_ = 35 - 27$ $\_\_ - 25 = 51 - 15$
Ngā matapae *Anticipations*	

Rapanga 10	I pātai te kaiako a Mere ki a iaki te whakaoti 18+7=?
	Ka hono a Mere i ngā tau e rua,ā, ka tuhi 18+7=25
	I pātai tana kaiakokia whakaoti tēnei 25-18=?
	Hei tā Mere ka mōhio kē ia ki t whakautu.
	Pehea a Mere i mōhio ai?
	Ka tika tēnei rautaki mā ngā tau katoa? Pehea koe i mōhio ai?
	Ka taea e koe te tuhi ētahi atu tauira tau?
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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA2-3:** Know the basic addition and subtraction facts. **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.
Whāinga Ako *Learning Outcomes*	• Explain and show how patterns and relationships help solve equations. • Explain and justify the inverse relationship of addition and subtraction.
Reo Matatini Pāngarau *Mathematical Language*	Conjecture, inverse relationship, generalisation, addition, subtraction.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students who use the inverse relationship rather than calculating. Highlight to the students that you do not need to calculate but can use the relationship to solve different equations. Ask students to consider whether this will always work and when it will not work. For example: $5 + 8 = 13$ $8 - 5 \neq 3$

	Connect Use quasi-variables to press the students to generalise the relationship. If 71 – 56 = 15 What other number sentences can you write using the same numbers?
Kōrero Tautoko *Teacher Notes*	• Students may compute each sum separately or draw on the inverse relationship between addition and subtraction. Draw student attention to those who draw on the inverse relationship. Allow students opportunities to explore inverse relationships. • Push students to generalise by finding their own equations. • Encourage students to prove and justify why the inverse relationship is true. • A quasi-variable is a large number that can represent any number. Students do not need to solve these examples, rather they look at the relationships and use that to explain what they notice/ what is happening mathematically.
Ngohe whakaharatau *Independent Tasks*	Solve these number sentences but look for any patterns or relationships that will help you solve them. 18 + 5 = 45 – 8 = 16 + 17 = 8 + 37 = 17 + 16 = 45 – 37 = 33 – 17 = 23 – 5 = 23 - 18 = 5 + 18 = 33 – 16 = 8 + 37 = What patterns and relationships did you notice?
Ngā matapae *Anticipations*	

Rapanga 11 (Optional task)	Kei te kohi anga a Mei. E 14 tāna, engari i kohia e 7 anō. E hia ngā anga inaianei?
	Kei te kohi anga a Mei. E 15 tāna, engari i kohia e 18 anō. E hia ngā anga inaianei?
	Kei te kohi anga a Mei. E 19 tāna, engari i kohia e 26 anō. E hia ngā anga 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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions. **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures. **NA1-5:** Generalise that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many. **NA2-3:** Know the basic addition and subtraction facts. **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.
Whāinga Ako *Learning Outcomes*	• Use place value to solve addition problems. • Use bridging to decades to solve addition problems. • Use equivalence and compensation to solve addition problems. • Explain and represent solutions using materials, words, pictures, empty number lines and symbols.
Reo Matatini Pāngarau *Mathematical Language*	Add, subtract

Hangaia Te Uurupounamu Mō Tātou - Taumata 1 (Tau 2) Tau me te Taurangi (ODD YEARS)

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share who are using equivalence and compensation or bridging to a decade to solve the problem. Record this on the board. If no students are using equivalence and compensation or bridging to a decade, then model as another way a student has used previously. Connect Ask students to describe how you would solve the following problems using equivalence and compensation or bridging to a decade: 88 + 5 = 17 + 49 =
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds board). • Expect to students to draw/record their number sentences. • Notice if students see patterns in each set of problems.
Ngohe whakaharatau *Independent Tasks*	Layla used 28 Lego blocks to build a tower. She added 6 more blocks to the tower. How many blocks did she use for the tower? Rakesh used 18 Lego blocks to build a tower. He added 19 more blocks to the tower. How many blocks did he use for the tower? Tipene used 24 Lego blocks to build a tower. He added 18 more blocks to the tower. How many blocks did he use for the tower? 29 + 7 = 9 + 34 = 17 + 26 =
Ngā matapae *Anticipations*	

| | |
| | |

Rapanga 12 (Optional task)	I tiki 24 ngā ārani a Semi. I hoatu 18 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 36 ngā ārani a Semi. I hoatu 19 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 45 ngā ārani a Semi. I hoatu e 26 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*	**NA1-1:** Use a range of counting, grouping, and equal-sharing strategies with whole numbers and fractions **NA1-4:** Communicate and explain counting, grouping, and equal-sharing strategies, using words, numbers, and pictures **NA2-1:** Use simple additive strategies with whole numbers and fractions. **NA2-3:** Know the basic addition and subtraction facts. **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.
Whāinga Ako *Learning Outcomes*	• Use bridging decades to solve subtraction problems. • Use equivalence and compensation to solve subtraction problems. • Use place value knowledge to solve subtraction problems. • Explain and represent solution strategies using materials, words, pictures, empty number lines and symbols.
Reo Matatini Pāngarau *Mathematical Language*	Tens, ones, add, subtract

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select student solution strategies where they have bridged decades, equivalence and compensation or place value knowledge. Represent this using equations and with tens frames. Connect Ask students to describe how you would solve the following problems using bridging decades, equivalence and compensation or place value knowledge: 37 – 18 = 45 – 27 =
Kōrero Tautoko *Teacher Notes*	• Introduce each problem one at a time and give students an opportunity to solve it and share back before introducing the next problem. • Have concrete material available if needed for students to select (e.g., tens frames, counters, hundreds boards). • Expect to students to draw/record their number sentences. • Notice if students use patterns to help them solve the problems.
Ngohe whakaharatau *Independent Tasks*	Select one or more of the following assessment tasks (attached at the end of the document) as the independent activity: N1: Addition and subtraction problems to solve. NA1: Write number sentences related to a dot pattern. NA2: Properties of numbers and operations.
Ngā matapae *Anticipations*	