HANGAIA TE URUPOUNAMU MŌ TĀTOU

Taumata 1 (Tau 1)
Tau me te Taurangi

Teacher Booklet
ODD YEARS

Rapanga 1	Kimihia ngā huinga 10.
	Tuhia ngā rerenga tau e hono ai ki au huinga 10 mā te tohu.
	Whiriwhirihia tētahi tau i waenga 11-19. Tohua te tau mā te anga tekau. Tuhia te rerenga tau e hono ai.
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*	• Identify groupings that equal ten. • Represent visual and symbolic patterns for numbers to ten so they can be recognised without counting (subitize). • Represent and explain thinking using pictures, numbers, and symbols.
Reo Matatini Pāngarau *Mathematical Language*	Number words (e.g., one, two, three, …), add, subtract, equation, equal sign.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share different ways of making ten and record the matching equation. Select students to share the different ways that they made the number and ask other students to agree or disagree. Connect: Facilitate the students to consider how they could re-write their number sentence as subtraction [e.g., $10 + 5 = 15$ so $15 - 5 = 10$). Ask students to re-write one of their number sentences as subtraction.

Kōrero Tautoko *Teacher Notes*	• Explain to students during the launch that combinations to ten are two tens frames that add to ten. • 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. • Provide markers/pens for students to draw and record their number sentences • Notice their representations - are they showing an understanding of groups of ten? Are they using the addition sign accurately e.g. $7 + 5 = 12$
Ngohe whakaharatau *Independent Tasks*	Choose a number between 10 – 19 and draw two tens frames that would make the number and write the matching number sentences. Find as many different ways as possible to make the number and each time draw the two tens frames and record the matching number sentences.
Ngā matapae *Anticipations*	

Rapanga 2 (Whole Class Option)	I kohia a Malakai 20 ngā rau ki ngā pēke e 2. He aha ngā huniga rerekē ki ngā pēke e rua? Ka taea te tā me te tuhi 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 25 pinecones. If no students use a systematic way then use the following example…
	Malakai has worked out a way to find all the different combinations. He begins by putting 25 pinecones in one bag and none in the other.
	Show using tens frames and record 25 + 0 = 25
	Then he knows that the next one will be 24 pinecones in one bag and one pinecone in the other.
	Show using tens frames and record 24 + 1 = 25
	Can you use Malakai's idea to find all of the different combinations?
Kōrero Tautoko *Teacher Notes*	• Provide students with bags of 20 counters and or other materials (multi-link cubes, etc) to represent pinecones. • 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. 12 + 8 = 20 • Highlight different combinations during sharing back.
Ngohe whakaharatau *Independent Tasks*	Mika has 18 marbles and two bags. What are the different ways that he could put the marbles into the bags? Can you record your ideas using drawings and number sentences?
Ngā matapae *Anticipations*	

Rapanga 3	E 9 ngā motoka tā Sita, i whiwhi e 6 anō? E hia āna motoka inaianei?
	E 6 ngā motoka tā Sita, i whiwhi 19 anō? E hia āna motoka inaianei?
	E 7 ngā motoka tā Sita, i whiwhi e 8 anō? E hia āna motoka inaianei?
	18 ngā motoka tā Sita, i whiwhi e 7 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 counting on or grouping to solve the problem. Record this on board or if no students are using counting on, then model as another way the teacher has seen used before. If students are mainly using counting on, then select students using equivalence and compensation or bridging to a decade to share or model this as an alternative solution strategy. Connect Ask students to describe how you would solve the following problems using bridging to a decade or equivalence and compensation: $29 + 6 =$ $8 + 39 =$ 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*	Sita has 9 toy cars and is given another 5 toy cars for her birthday. How many toy cars does Sita have now? Leon has 5 toy cars and is given 19 toy cars for his birthday. How many toy cars does Leon have now? Maka has 4 toy cars and is given another 8 toy cars for his birthday. How many toy cars does Maka have now? Arapera has 18 toy cars and is given another 4 toy cars for her birthday. How many toy cars does Arapera have now? $3 + 9 =$ $3 + 19 =$ $8 + 9 =$ $18 + 9 =$
Ngā matapae *Anticipations*	

Rapanga 4	Whakaoti ēnei rerenga tau
	7+8=
	7+18=
	6+5=
	16+5=
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: 4 + 3 = 14 + 3 = 14 + 13 = 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: 3 + 2 = 3 + 12 = 13 + 12 = 4 + 5 = 14 + 5 = 14 + 15 = What patterns did you notice as you solved these problems?
Ngā matapae *Anticipations*	

Rapanga 5	12 ngā māpere a Mala. I hoatu e 3 ki tōna tūngane. E hia āna māpere inaianei? 22 ngā māpere a Mala. I hoatu e 3 ki tōna tūngane. E hia āna māpere inaianei? 15 ngā māpere a Mala. I hoatu e 6 ki tōna tūngane. E hia āna māpere inaianei? 25 ngā māpere a Mala. I hoatu e 6 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
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. Represent this using equations and with tens frames. Bridging decades 12 – 3 = 12 – 2 = 10 10 – 1 = 9 If no students are using bridging to decades, 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: 34 – 5 = 23 - 9 =
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*	Mala has 13 marbles in her collection, and she gave 4 marbles to her brother. How many marbles does she have now? Haki has 23 marbles in her collection, and she gave 4 marbles to her sister. How many marbles does she have now? 14 – 5 = 24 – 5 = 16 – 7 = 26 – 7 =
Ngā matapae *Anticipations*	

Rapanga 6	Whakaoti ēnei 17-9= 27-9= 13-7= 23-7=
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: $24 - 8 =$ $34 - 8 =$ $44 - 18 =$ 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. $15 - 9 =$ $25 - 19 =$ $16 - 7 =$ $12 - 6 =$ $22 - 6 =$ $18 - 9 =$ What patterns did you notice? How did they help you?
Ngā matapae *Anticipations*	

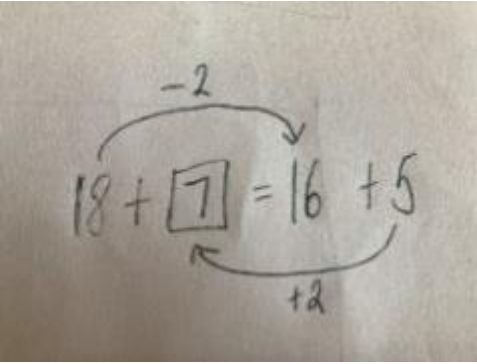|	

Rapanga 7 (Whole Class Option)	He mahi takirua. Wānangahia ēnei, whiriwhirihia ko ēhea ngā mea tika, ko ēhea ngā mea hē. 25=25 9+6=15+4 18=9+9 8+6=5+9 15-7=14-6 13-7=13-7 17=25 Whakamāramahia mai ou whakautu.
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 ($9 + 6 = 15 + 4$ is true because $9 + 6 = 15$). 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 te tau e ngaro ana 9+4=_+5 5+9=7+_ 18+_=17+5 _+24=7+26
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., 9 + 4 = 13 + 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.

$16 + 7 = \underline{\ \ } + 8$
$\underline{\ \ } + 19 = 15 + 18$

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 $7 + 8 = \underline{\ \ } + 6$ $9 + 5 = 7 + \underline{\ \ }$ $\underline{\ \ } + 14 = 19 + 15$ $17 + \underline{\ \ } = 15 + 16$
Ngā matapae *Anticipations*	

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Rapanga 9	Kimihia te tau e ngaro ana 13-8=14-_ 14-9=_-7 21-_=23-6 _-6=24-5
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. 12 – 7 = __ – 8 45 – 9 = 43 – __

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 $13 - 8 = 12 - 9$. 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: $11 - 7 = 12 - \_\_$ $15 - 8 = \_\_ - 6$ $23 - \_\_ = 25 - 17$ $\_\_ - 16 = 21 - 15$
Ngā matapae *Anticipations*	

Rapanga 10	Ka whakaoti a Josiah I ēnei: 8-0= 56-0= 122-0= 1359-0= I kite ia i tētahi tauira. He aha tana kitenga? Ka tika tēnei 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.
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.
Whāinga Ako *Learning Outcomes*	• Identify and describe the properties of zero when adding or subtracting. • Make a conjecture and prove this with materials and symbols. • Describe patterns and relationships using mathematical language.
Reo Matatini Pāngarau *Mathematical Language*	Zero, conjecture, prove, addition, subtraction.
Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students who have developed conjectures to share these (e.g., if you take zero away from a number, you get the number you started with). Facilitate students to notice other patterns related to zero and ask them to explain and justify whether they will always work using equipment. Select students that have built concrete models to share their

	generalisations. Connect Explain that in mathematics, we can use symbols or letters to represent any number. Model how to represent a rule that works for any numbers … e.g., $\Delta - 0 = \Delta$ Ask students to use symbols to represent the rules that they have created.
Kōrero Tautoko *Teacher Notes*	• Have appropriate equipment for students to build concrete models to prove their conjectures (e.g., counters, cubes). • Encourage students to explore multiple patterns with zero.
Ngohe whakaharatau *Independent Tasks*	Find the missing numbers. $18 = 7 + \_\_$ $10 - 2 = 6 + \_\_$ $15 - 8 = \_\_ - 7$ $17 + \_\_ = 18 + 5$ $\_\_ + 29 = 17 + 28$ $23 - 18 = 20 - \_\_$
Ngā matapae *Anticipations*	

Rapanga 11 (Optional task)	Kei te kohi anga a Mei. E 8 tāna, engari i kohia e 6 anō. E hia ngā anga inaianei? Kei te kohi anga a Mei. E 6 tāna, engari i kohia e 18 anō. E hia ngā anga inaianei? Kei te kohi anga a Mei. E 28 tāna, engari i kohia e 6 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

Tohatoha Whakaaro/Wā Hononga *Sharing back/ Connect*	Select students to share who are using counting on to solve the problem. Record this on board or if no students are using counting on, then model as another way the teacher has seen used before. If students are mainly using counting on, then select students using equivalence and compensation or bridging to a decade to share or model this as an alternative solution strategy. Connect Ask students to describe how you would solve the following problems using equivalence and compensation or bridging to a decade: $7 + 29 =$ $59 + 8 =$
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*	Meilani is collecting shells. She has 8 shells and picks up another 4 shells. How many does she have now? Timo is collecting shells. He has 3 shells and picks up another 19 shells. How many does he have now? Raj is collecting shells. She has 5 shells and picks up another 18 shells. How many does she have now? $7 + 6 =$ $9 + 15 =$ $12 + 9 =$
Ngā matapae *Anticipations*	

Rapanga 12 (Optional task)	I tiki 16 ngā ārani a Semi. I hoatu e 7 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 18 ngā ārani a Semi. I hoatu e 9 ki tōna Māmā. E hia ngā ārani a Semi inaianei? I tiki 14 ngā ārani a Semi. I hoatu e 6 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: 27 – 8 = 35 – 17 =
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*	