RICH MATHEMATICAL TASK BOOKLET

NUMBER & ALGEBRA

YEAR 1

Teacher Booklet

Task 1

Can you find all the combinations to ten?

Record the number sentences that match your combinations to 10 using an addition sign.

Choose a number between 11 – 19 and represent this in as many ways as you can using the tens frames. Record the number sentences that match.

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

Shareback

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.

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.

Curriculum Links

During the first year

Subitise (recognise without counting) the number of objects in a collection of up to 10

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

Join and separate groups of up to a total of 20 objects and find the difference between groups by grouping and counting (e.g., 9 + 6, 7 + __ = 11)

Suggested 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.

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.

Mathematical Language

Number words (e.g., one, two, three, ...), add, subtract, equation, equal sign.

Anticipations

Solutions, Misconceptions

Task 2

Malakai has collected 20 pinecones in two bags.
What are all the different ways that he could put the pinecones into the two bags?

Can you record your ideas using drawings and number sentences?

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.

Shareback

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).

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.

Curriculum Links

Subitise (recognise without counting) the number of objects in a collection of up to 10

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

Join and separate groups of up to a total of 20 objects and find the difference between groups by grouping and counting (e.g., 9 + 6, 7 + __ = 11)

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 20 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 20 pinecones in one bag and none in the other.

[Show using tens frames and record 20 + 0 = 20]

Then he knows that the next one will be 19 pinecones in one bag and one pinecone in the other.

[Show using tens frames and record 19 + 1 = 20]

Can you use Malakai's idea to find all of the different combinations?

Suggested Learning Outcomes

Split and recombine numbers to make groupings to 20.

Use patterns and relationships to solve problems.

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?

Mathematical Language

Number words, add, subtract, equation, equal sign.

Anticipations

Solutions, Misconceptions

Task 3

Sita has 9 toy cars and is given another 6 toy cars for her birthday. How many toy cars does Sita have now?

Leon has 6 toy cars and is given 19 toy cars for his birthday. How many toy cars does Leon have now?

Maka has 7 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 7 toy cars for her birthday. How many toy cars does Arapera have now?

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.

Shareback

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.

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.

Curriculum Links

Explore addition facts up to and their corresponding subtraction facts (families of facts), including doubles and halves.

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

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.

Suggested 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.

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 =

Mathematical Language

Number words, add, subtract, equation, equal sign.

Anticipations

Solutions, Misconceptions

Task 4

Solve the following problems:

7 + 8 =
7 + 18 =
6 + 5 =
16 + 5 =

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.

Shareback

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?

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.

Curriculum Links

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

Identify, read, and write whole numbers up to at least 20, and represent them using the ten-and-ones structure of teen (11-19) and -ty (multiples of 10) numbers (e.g., 17 = 10 + 7, 20 = 2 x 10)

Suggested 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.

Mathematical Language

Tens, ones, add

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?

Anticipations

Solutions, Misconceptions

Task 5

Mala has 12 marbles in her collection, and she gave 3 marbles to her brother. How many marbles does she have now?

Haki has 22 marbles in her collection, and she gave 3 marbles to her sister. How many marbles does she have now?

Sima has 15 marbles in his collection, and he gave 6 marbles to her sister. How many marbles does he have now?

Ali has 25 marbles in his collection, and he gave 6 marbles to his brother. How many marbles does he have now?

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.

Shareback

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.

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.

Curriculum Links

Explore addition facts up to and their corresponding subtraction facts (families of facts), including doubles and halves

Identify, read, and write whole numbers up to at least 20, and represent them using the ten-and-ones structure of teen (11-19) and -ty (multiples of 10) numbers (e.g., 17 = 10 + 7, 20 = 2 x 10).

Connect

Ask students to describe how you would solve the following problems using bridging to decades:

34 – 5 =

23 - 9 =

Suggested 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.

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 =

Mathematical Language

Tens, ones, add, subtract.

Anticipations

Solutions, Misconceptions

Task 6

17 – 9 =

27 – 9 =

13 – 7 =

23 – 7 =

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.

Shareback

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?

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.

Curriculum Links

Explore addition facts up to and their corresponding subtraction facts (families of facts), including doubles and halves.

Identify, read, and write whole numbers up to at least 20, and represent them using the ten-and-ones structure of teen (11-19) and -ty (multiples of 10) numbers (e.g., 17 = 10 + 7, 20 = 2 x 10).

Suggested 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.

Mathematical Language

Tens, ones, add, subtract.

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?

Anticipations

Solutions, Misconceptions

Task 7

Work with your partner to work out which number sentences are true or false.

25 = 25
9 + 6 = 15 + 4
18 = 9 + 9
8 + 6 = 5 + 9
15 – 7 = 14 – 6
13 – 7 = 13 – 7
17 = 25

Explain why you think the number sentences are true or false.

Teacher Notes

Ensure that students understand what true and false means. Introduce notation of not equal (≠) 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.

Shareback

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.

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.

Curriculum Links

Solve true or false number sentences and open number sentences involving addition and subtraction of onedigit numbers, using an understanding of the equal sign (e.g., 2 + 5 = 3 + _, 7 – 5 = 6 – 4 (T or F?)

Connect

Ask students to write their own true and false number sentences.

Note students who use the equal sign flexibly.

Suggested 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.

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!

Mathematical Language

Equal sign, relationship, same, different.

Anticipations

Solutions, Misconceptions

Task 8

Can you find the missing numbers?

9 + 4 = _ + 5

5 + 9 = 7 + _

18 + _ = 17 + 5

_ + 24 = 7 + 26

Teacher Notes

Students may begin by demonstrating misconceptions. This can be used to position students to agree/disagree.

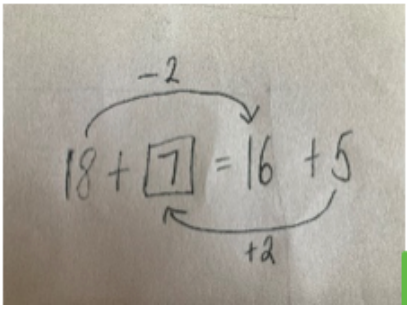
Some students may work out one side and then the other to equal the same number. However, the key focus should be on positioning students to use the relationships across the equal sign.

Draw attention to students who use relational types of thinking and notate the number sentences with arrows to highlight this (shown above).

Shareback

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.



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.

Curriculum Links

Solve true or false number sentences and open number sentences involving addition and subtraction of one- and two-digit numbers, using an understanding of the equal sign (e.g., 18 + _ = 17 + 6, 17 = 25 (T or F?)

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 = _ + 8

_ + 19 = 15 + 18

Suggested Learning Outcomes

Make and identify groupings for numbers from 0-10.

Represent, explain, and justify number groupings between 0-10 using pictures, numbers, and words.

Independent Tasks

Find the missing number

7 + 8 = _ + 6

9 + 5 = 7 + _

_ + 14 = 19 + 15

17 + _ = 15 + 16

Mathematical Language

Equal sign, relationship, same, difference, add, subtract.

Anticipations

Solutions, Misconceptions

Task 9

Can you find the missing numbers?

13 – 8 = 14 – _

14 – 9 = _ – 7

21 – _ = 23 – 6

_ – 6 = 24 – 5

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).

Shareback

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.

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.

Curriculum Links

Solve true or false number sentences and open number sentences involving addition and subtraction of one- and two-digit numbers, using an understanding of the equal sign (e.g., 18 + _ = 17 + 6, 17 = 25 (T or F?).

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 – _

Suggested 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.

Independent Tasks

Find the missing numbers:

11 – 7 = 12 – _

15 – 8 = _ – 6

23 – _ = 25 – 17

_ – 16 = 21 – 15

Mathematical Language

Equal sign, relationship, same, different.

Anticipations

Solutions, Misconceptions

Task 10

Josiah solves the following problems:

8 – 0 =

56 – 0 =

122 – 0 =

1359 – 0 =

He notices a pattern as he solves the problems. What do you think he notices?

Does this pattern always work?

What other patterns can you find that involve zero?

Do they always work?

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.

Shareback

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.

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.

Curriculum Links

Identify, read, and write whole numbers up to at least 20, and represent them using the ten-and-ones structure of teen (11-19) and -ty (multiples of 10) numbers (e.g., 17 = 10 + 7, 20 = 2 x 10).

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., Δ − 0 = Δ

Ask students to use symbols to represent the rules that they have created.

Suggested 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.

Independent Tasks

Find the missing numbers.

18 = 7 + _

10 − 2 = 6 + _

15 − 8 = _ − 7

17 + _ = 18 + 5

_ + 29 = 17 + 28

23 − 18 = 20 − _

Mathematical Language

Zero, conjecture, prove, addition, subtraction.

Anticipations

Solutions, Misconceptions

Task 11

Meilani is collecting shells. She has 8 shells and picks up another 6 shells. How many does she have now?

Timo is collecting shells. He has 6 shells and picks up another 18 shells. How many does he have now?

Raj is collecting shells. She has 28 shells and picks up another 6 shells. How many does she have now?

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.

Shareback

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 equivalence and compensation or bridging to a decade:

7 + 29 =

59 + 8 =

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.

Curriculum Links

Explore addition facts up to and their corresponding subtraction facts (families of facts), including doubles and halves.

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

Suggested 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.

Mathematical Language

Add, subtract

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 =

Anticipations

Solutions, Misconceptions

Task 12

Sesimani helped to pick 16 mandarins from the tree. She gave 7 mandarins away. How many does she have left?

Damon helped to pick 18 mandarins from the tree. He gave 9 mandarins away. How many does he have left?

Daisy helped to pick 14 mandarins from the tree. She gave 6 mandarins away. How many does she have left?

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.

Shareback

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 =

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.

Curriculum Links

Explore addition facts up to and their corresponding subtraction facts (families of facts), including doubles and halves.

Partition and regroup up to 20 objects in different ways, using a systematic approach and noticing patterns

Suggested 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.

Mathematical Language

Add, subtract

Independent Tasks

Select one or more of the assessment tasks (attached at the end of the document) as the independent activity

Task 1: Addition and subtraction problems to solve.

Task 2: Write number sentences related to a dot pattern.

Task 3: Properties of numbers and operations.

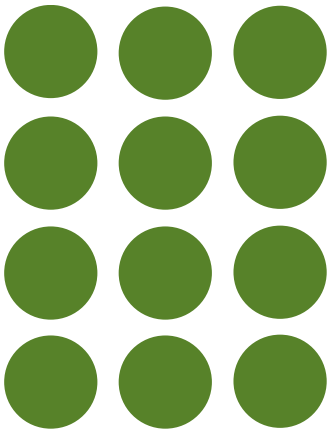
Anticipations

Solutions, Misconceptions

Assessment Task 1 - Number - Year 1

Write one or more word problems for a friend involving addition or subtraction. Show how you would solve them.

Assessment Task 2 - Number - Year 1



Write number sentences about the dots above.

Describe what patterns you can find.

Why do your patterns work?

Do they work with other numbers?

Assessment Task 3 - Number - Year 1

3 + 4 = 9 + 5 = 2 + 2 + 2 = 4 + 3 =

7 + 3 = 3 + 7 = 10 - 7 =

10 - 3 = 3 x 2 = 10 + 5 = 2 x 3 =

Look at the number sentences above.

Describe what patterns you can find.

Why do your patterns work?

Do they work with other numbers?