RICH MATHEMATICAL TASK BOOKLET

NUMBER Multiplication & Division

YEAR 2

Teacher Booklet

Task 1

Chaewon and Ali are playing with tiles. They have 12 square tiles that are the same. They make a grid so the tiles join together, can you make a grid with your tiles so that they are joined together?

Can you draw the pattern you have made with your tiles?

Have a go at drawing these grids:

A grid that is 2 by 10

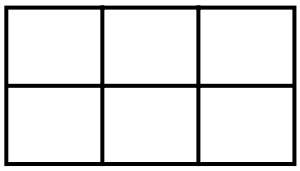
A grid that is 5 by 3

A grid that is 3 by 7

A grid that is 6 by 4

Teacher Notes

Before you launch the task, show the students the grid below and ask them to draw it:



Ask them to compare their drawing to the grid and re-draw it until it is accurate.

Have 2-D tiles or cardboard squares available for students to manipulate.

Provide grid paper for those who are struggling to draw representations.

During first task progression, notice whether students have placed the tiles horizontally or vertically and whether they are in a line.

Ask students whether the horizontal and vertical representation is the same or different. Draw their attention to it being the same no matter which direction it is placed in.

Ask students to draw their grid representation and compare to the model. Repeat until drawing is accurate.

Provide students with grid paper or squares if they have difficulty drawing the grids.

Big Ideas

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

An array can represent a group.

Curriculum Links

Group objects in a collection of at least 10, subitise the number of objects in each part, and find the total number in the collection using the parts.

Connect

Can you use these sticks to make the same grids you made with the tiles?

Provide students with ice-block sticks.

Suggested Learning Outcomes

Describe how an array represents a group.

Represent a grid in a structured way.

Independent Tasks

Tia has 32 shells and four bags.

What are the different ways that she could put the shells into the bags?

Can you record your ideas using drawing and number sentences?

Mathematical Language

Number words, row, column, array, multiply, groups of.

Anticipations

Solutions, Misconceptions

Task 2

How many dots are there?

Draw a picture of the array.

Record number sentences to match the array and show how you know how many dots there are.

Teacher Notes

Before the launch, do a choral count in twos starting from 50. Record on the board like this:

50 52 54 56 58
60 62 64 66 68

Ask students to identify the patterns in the count and predict further terms

Begin by using the array of 12 dots. Ask the students how many dots there are in total by imagining pulling the dots apart into a number of identical pieces. Ask, what is the quickest way to do this? Expect the students to group in threes or fours.

Provide students with dot cards and ask them to work out how many dots there are using grouping strategies.

Support students to group beyond counting by ones. Encourage and notice students who count or add using groups. Highlight this to all students.

Model how to use number sentences including multiplication to record the groupings.

Notice whether students begin to notice the commutative property of multiplication, e.g., $3 \times 4 = 4 \times 3$

For the independent activity, have counters available.

Shareback

For the first array, select students who represent the 12 as three columns of four or four columns of three dots.

If no students suggest this, then model how the 12 could be represented in this way.

For the dot cards, select students to share who have used groups in their solutions. Record the groups using number sentences- and multiplication.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

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

Group objects in a collection of at least 10, subitise the number of objects in each part, and find the total number in the collection using the parts.

Connect

Draw an array of 20 dots.

Write matching equations for your array.

What do you notice?

Suggested Learning Outcomes

Describe how an array represents a group.

Use grouping, repeated addition or multiplication to work out how many dots are in an array.

Represent an array in a structured way.

Independent Tasks

Can you make these arrays using counters and draw them?
Record matching number sentences.

7 by 4

5 by 8

8 by 6

10 by 5

Mathematical Language

Number words, row, column, array, multiply, groups of.

Anticipations

Solutions, Misconceptions

Task 3

Amanda Bean loves to count. At the sweet shop, this is what she sees.

Seven lollipop stands with 5 lollipops on each.
How many lollipops are there altogether?

Four trays with 8 cupcakes on each tray.
How many cupcakes are there altogether?

Six boxes with 7 packets of skittles in each box.
How many skittles are there altogether?

Teacher Notes

Read the book "Amanda Bean's Amazing Dream" or watch https://www.youtube.com/watch?v=4nbAsD0iKjo as a shared book during a literacy session.

During the launch, revisit Amanda Bean and some of the things she liked to do mathematically. Discuss with the students whether they always using counting or whether they ever use other ways of grouping and why.

Have available a range of different discrete materials which students can use to group in sets or arrays

Notice if the students organise the materials in an array rather than discrete sets as in the first tasks.

XXXX
XXXX

Use the term grouping or chunking to indicate to the students that they are using units rather than counting by one.

Notice the students who use 'lots of' or 'groups of' to describe the chunks and reinforce this language.

Shareback

Select students to share who have used grouping or repeated addition to solve the multiplication tasks rather than counting.

Big Ideas

Numbers can be partitioned and combined to solve more complex addition and subtraction and simple multiplication and division problems.

Numbers can be represented in a variety of ways.

Equations show relationships of equality between parts on either side of the equal sign.

Repeated addition is the same as multiplication.

The commutative property means that 3 × 6 is the same as 6 × 3 so 6 × 3 = 3 × 6.

Curriculum Links

Count forwards or backwards in 1s, 2s, 5s, and 10s from any whole number between 1 and 100

Identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Connect

Write equations to match how you solved the tasks.

Amanda Bean saw five trays with 9 chocolate bars on each tray.
Write the equation that she could use to work out the total number of chocolate bars.

Suggested Learning Outcomes

Use grouping to solve addition and multiplication problems without counting each object.

Make and identify groupings.

Describe how an array represents a group.

Represent an array in a structured way.

Represent, explain, and justify groupings using pictures, numbers, symbols, and words.

Independent Tasks

Amanda Bean loves to count. At the sweet shop, this is what she sees.

Four lollipop stands with 5 lollipops on each.
How many lollipops are there altogether?

Six trays with 4 cupcakes on each tray.
How many cupcakes are there altogether?

Eight boxes with 3 packets of skittles in each box.
How many skittles are there altogether?

Mathematical Language

Times, multiply, equals, repeat, chunking, multiplication, lots of, sets of, twice, double, half, same as

Anticipations

Solutions, Misconceptions

Task 4

Amanda Bean has been a busy girl. She been making putiputi with her beans.

If she puts 9 blue beans in each putiputi and she makes 3 putiputi, how many blue beans does she use altogether?

If she puts 5 yellow beans in each putiputi and she makes 8 putiputi, how many yellow beans does she use altogether?

If she puts 9 red beans in each putiputi and she makes 8 putiputi, how many red beans does she use altogether?

Teacher Notes

Before the launch, do a choral count in fives starting from 0. Record on the board like this:

0 5 10 15
20 25 30

Ask students to identify the patterns in the count and specifically ask them to notice the ones digit and note that it is always a 0 or 5

Have available a range of different discrete materials which students can use to group in chunks/sets.

Facilitate the students to organise the materials in an array rather than discrete sets and press them to use notation to match their materials.

Notice students who use chunking and groups to solve the tasks rather than counting. For example, they might solve 8 × 5 by working out 4 groups of ten.

Expect students to represent using symbols (or teacher record for students) as well as materials.

For the independent activity, provide the students with counters or beans.

Shareback

Select students to share who have used grouping or repeated addition to solve the multiplication tasks rather than counting.

Big Ideas

Numbers can be partitioned and combined to solve more complex addition and subtraction and simple multiplication and division problems.

Numbers can be represented in a variety of ways.

Equations show relationships of equality between parts on either side of the equal sign.

Repeated addition is the same as multiplication. The commutative property means that 3 × 6 is the same as 6 × 3 so 6 × 3 = 3 × 6.

Curriculum Links

Count forwards or backwards in 1s, 2s, 5s, and 10s from any whole number between 1 and 100

Identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Connect

This is how Amanda Bean solved the first task: “I know that 2 times 9 is 18 and then I just added one more group of 9”.

Does her solution work?

How would Amanda Bean solve 3 times 8?

Suggested Learning Outcomes

Use grouping to solve addition and multiplication problems without counting each object.

Make and identify groupings.

Describe how an array represents a group.

Represent an array in a structured way.

Represent, explain, and justify groupings using pictures, numbers, symbols, and words.

Independent Tasks

Amanda Bean has been a busy girl. She been making putiputi with her beans.

If she puts 9 blue beans in each putiputi and she makes 4 putiputi, how many blue beans does she use altogether?

If she puts 5 yellow beans in each putiputi and she makes 6 putiputi, how many yellow beans does she use altogether?

If she puts 7 red beans in each putiputi and she makes 7 putiputi, how many red beans does she use altogether?

Mathematical Language

Times, multiply, equals, repeat, chunking, multiplication, lots of, sets of, twice, double, half, same as

Anticipations

Solutions, Misconceptions

Task 5

Which number sentences are true or false:

4 + 4 + 4 + 4 + 4 = 5 x 4

7 × 8 = 7 + 7 + 7

6 × 3 = 6 + 6 + 6

9 + 9 + 9 = 9 × 4

What do you notice?

Make a conjecture and use the material to explore and prove the conjecture.

Teacher Notes

Before you launch the task, write doubles on the board up to 10 and ask the students to solve the equations

1 + 1 =	1 x 2 =
2 + 2 =	2 x 2 =
3 + 3 =	3 x 2 =
4 + 4 =	4 x 2 =
5 + 5 =	5 x 2 =
6 + 6 =	6 x 2 =
7 + 7 =	7 x 2 =
8 + 8 =	8 x 2 =
9 + 9 =	9 x 2 =
10 + 10 =	10 x 2 =

Ask students to solve each equation before writing up the next equation. Ask the students to identify patterns in the answers.

Have counters or grid paper available for the students to use to explore and prove their conjectures.

Notice whether students can identify which number sentences are true and false without calculating.

When students have made the conjectures, record this on the board and encourage students to ask questions and work with them to refine the conjecture and improve it using mathematical language.

Provide students with time to explore their conjecture and test it with other numbers and with concrete material.

For the independent task, have counters or cubes available.

Big Ideas

Equations show relationships of equality between parts on either side of the equal sign.

Patterns and relationships can be used, represented and generalised in a variety of ways.

Repeated addition is the same as multiplication.

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?)

Identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Shareback

Select students to share who can identify which number sentences are true and false without calculating by using the structure of multiplication and repeated addition.

For the second part of the tasks, select students to share who have made a conjecture that repeated addition is the same as multiplication and used an array to model and prove this.

Connect

58 + 58 + 58 + 58 = _ × _

93 × 5 = _ + _ + _ + _ + _

▲ + ▲ + ▲ = _ × _

Suggested Learning Outcomes

Identify true and false number sentences involving multiplication and repeated addition.

Develop a conjecture about the relationship between repeated addition and multiplication.

Explore and prove a conjecture using material.

Independent Tasks

Sepi likes to collect pinecones and put them in rows to count them.

If there are 3 rows of pinecones and 8 pinecones in each row. How many pinecones are there altogether?

If there are 6 rows of pinecones and 6 pinecones in each row. How many pinecones are there altogether?

If there are 7 rows of pinecones and 9 pinecones in each row. How many pinecones are there altogether?

Mathematical Language

Times, multiply, equals, repeated addition, multiplication, sets of, array.

Anticipations

Solutions, Misconceptions

Task 6

Amanda Bean and Leilani are sharing 24 stickers. If they shared them fairly, how many would they each get?

Show how you can solve the task in different ways.

If Sonny joined them as well, how many would they each get?

Show how you can solve the task in different ways.

If there were four friends in total, how many would they each get?

Show how you can solve the task in different ways.

Teacher Notes

Before you launch the task, write the equations up on the board one by one and ask the students to solve the equations before writing the next one

2 - 1 =	2 ÷ 2 =
4 - 2 =	4 ÷ 2 =
6 - 3 =	6 ÷ 2 =
8 - 4 =	8 ÷ 2 =
10 - 5 =	10 ÷ 2 =
12 – 6 =	12 ÷ 6 =
14 – 7 =	14 ÷ 2 =
16 – 8 =	16 ÷ 2 =
18 – 9 =	18 ÷ 2 =
20 – 10 =	20 ÷ 2 =

Ask students what they notice and to identify any patterns in the equations

Have counters available for the students to use to model the problem.

Facilitate the students to notice that using structure to solve the tasks is quicker and easier than counting or using trial and error.

For the second task, support students to notice that the structure for dividing into 3 groups is different than dividing into 2 groups.

Facilitate students to use structured ways of dividing for the second and third task.

Expect students to represent using an array in the connect. Teacher record symbols to represent the groupings.

This task focuses on dividing a collection of objects into a given number of equal groups. This is called sharing division or partitive division.

For the independent task, have counters or beads available.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

There are patterns to the ways numbers are formed.

Objects in a set can be grouped in twos or fours to get a final total.

An array can represent a group.

Curriculum Links

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Recall multiplication and corresponding division facts for 2s, 3s, 5s, and 10s

Shareback

For the first task, students may solve the task in different ways as below. Select students to share who have used a structured way to split the stickers. If no students solve the task in a structured way, then model this for the students.

For the second task, select students to share who have solved the task in a structured way. If no students solve the task in a structured way, then model this for the students.

For the third task, select students to share who have solved the task in a structured way. If no students solve the task in a structured way, then model this for the students.

Students may share the stickers out 1 or 2 at a time.

Students may make 2 groups of stickers and count how many is in each.

Students may put the stickers in a row and split them in the middle.

Students may make a 2 by 12 array showing two groups of 12 (structured).

Students might recall that two 12s make 24 (structured).

Connect

Draw a picture of how you shared the 24 stickers between 2, 3, and 4 children. If no students draw an array then model this.

[Teacher to model recording this as division under the picture for the children e.g., 12 ÷ 2 = 6; 12 ÷ 3 = 4, 12 ÷ 4 = 3]

What happens if you try and share 24 stickers fairly between 5 children?

Mathematical Language

Divide, equal groups, chunking, array, sets.

Suggested Learning Outcomes

Divide a set of objects by two, three, and four.

Use grouping to solve division problems without counting each object.

Count in groups.

Describe how an array represents a group.

Represent an array in a structured way.

Independent Tasks

Amanda Bean and Leilani are sharing 16 stickers. If they shared them fairly, how many would they each get?

Draw how you solved the task using an array.

If there were 4 friends to share the 16 stickers, how many would they each get?

Draw how you solved the task using an array.

Amanda Bean and Leilani are sharing 18 stickers. If they shared them fairly, how many would they each get?

Draw how you solved the task using an array.

If there were 3 friends to share the 18 stickers, how many would they each get?

Draw how you solved the task using an array.

Anticipations

Solutions, Misconceptions

Task 7

There are 30 tamariki in the Kapa Haka group. Whaea Mere wants them to sit in six equal groups. How many tamariki will be in each group?

What if the Whaea Mere only wanted them to sit in two equal groups? How many tamariki would be in each group?

There are 21 tamariki in the music group. Each tamariki plays an instrument – a shaker, triangle, or drum. The same number of tamariki play each instrument.

How many tamariki play each instrument?

Teacher Notes

Before you launch do a choral count in 10s starting from 0 and written as

10 110
20 120
30 130
40
50
60
70
80
90
100

Write up multiplication facts, e.g.,

3 x 10 = 7 x 10 =
5 x 10 6 x 10 =
9 x 10 = 2 x 10 =

Ask student to solve the multiplication facts and make connections between the choral count and multiplication facts.

Have counters available for the students to use to model the problem.

Facilitate the students to notice that using structure and an array to solve the tasks is quicker and easier than counting or using trial and error.

For the second task, drawing or different coloured counters (to represent the different instruments) could be used.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

There are patterns to the ways numbers are formed.

Objects in a set can be grouped in twos or fours to get a final total.

An array can represent a group.

Curriculum Links

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Multiply a one- or two-digit number by a one-digit number, using skip counting or known facts (e.g. 4 × 6; 2 × 23)

Teacher Notes

Facilitate students to use structured ways of dividing.

In the connect, support students to notice that both operations involve equal groups, however, with multiplication the groups are put together and for division they are split apart. This means that multiplication and division are opposite or inverse. Use this notion to highlight that if you know 3 groups of 7 are 21 then you also know that 21 divided by 3 is 7.

This task focuses on dividing a collection of objects into a given number of equal groups. This is called sharing division or partitive division.

For the independent task, have counters available.

Shareback

For the first task, select students to share who have either visualised six groups of five or have arranged the counters into an array using a 6 x 5 structure. This structure will also help them see that if there were only 2 groups, there would be 15 in each. If no students have used an array, model this for them.

For the second task, select students to share who have either visualised three groups of seven or have arranged the counters into an array using a 3 x 7 structure.

Connect

How is division the same as multiplication?

How is division different than multiplication?

How can you divide two numbers?

Suggested Learning Outcomes

Divide a set of objects by two, three, and six.

Use grouping to solve division problems without counting each object.

Describe how an array represents a group.

Represent an array in a structured way.

Recognise and describe the relationship between multiplication and division.

Mathematical Language

Divide, equal groups, chunking, array, sets.

Independent Tasks

There are 35 tamariki in the Kapa Haka group. Whaea Mere wants them to sit in five equal groups.

How many tamariki will be in each group?

There are 27 tamariki in the music group. Each tamariki plays an instrument – a shaker, triangle, or drum. The same number of tamariki play each instrument.

How many tamariki play each instrument?

Anticipations

Solutions, Misconceptions

Task 8

Tomasi has made 36 topoi. He wants to share them with his family and give them 3 each. How many family members can he give topoi?

How many family members could Tomasi share his topoi with if he decides to give them 4 each instead?

How many family members could Tomasi share his topoi with if he decides to give them 6 each instead?

Teacher Notes

Before the launch, do a choral count in twos starting from 0. Record on the board like this:

0 2 4 6 8
10 12 14 16 18

Write up multiplication facts, e.g.,

2 x 4 =	9 x 2 =
5 x 2 =	2 x 6 =
2 x 8 =	3 x 2 =
2 x 7 =	10 x 2 =

Ask student to solve the multiplication facts and make connections between the choral count (skip counting) and multiplication facts

Have available counters or pictures of topoi for the students to model the problem.

Facilitate the students to notice that using structure to solve the tasks is quicker and easier than sharing by twos or using trial and error.

Facilitate students to use structured ways of dividing for the second and third task.

Expect students to represent using an array in the connect. If necessary, students could model the array with the counters and then draw this. Teacher record symbols to represent the groupings.

This task focuses on repeatedly subtracting a group from a total number until nothing is left. This is called subtraction division or quotitive division.

For the independent task, have counters or jellybeans available.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

There are patterns to the ways numbers are formed.

Objects in a set can be grouped in twos or fours to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

An array can represent a group.

Curriculum Links

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Recall multiplication and corresponding division facts for 2s, 3s, 5s, and 10s

Shareback

For the first task, students may solve the task in different ways as below. Select students to share who have used a structured way to split the topoi. If no students solve the task in a structured way, then model this for the students.

For the second task, select students to share who have solved the task in a structured way. If no students solve the task in a structured way, then model this for the students.
For the third task, select students to share who have solved the task in a structured way. If no students solve the task in a structured way, then model this for the students.
Students may share the topoi out 3 at a time.
Students may count the topoi in 3s and keep track of the groups they counted.
Students may make a 3 by 12 array showing 12 groups of 3 (structured).
Students might recall that three 12s make 36 (structured).

Connect

Draw a picture of how you shared the 36 topoi out by 3, 4, and 6. If no students draw an array then model this.

How can you record this? [If students don't know then teacher to model recording this as division under the picture for the children e.g., 36 ÷ 3 = 12; 36 ÷ 4 = 9, 36 ÷ 6 = 6]

What was the same and different when you shared the topoi out by 3, 4, and 6?

Suggested Learning Outcomes

Divide a set of objects by two, three, and six.

Use grouping to solve division problems without counting each object.

Describe how an array represents a group.

Represent an array in a structured way.

Independent Tasks

Tomasi has 14 topoi. He wants to share them with his friends and give them 2 each. How many friends can he share them with?

Tomasi has 25 topoi. He wants to share them with his friends and give them 5 each. How many friends can he share them with?

Tomasi has 28 topoi. He wants to share them with his friends and give them 4 each. How many friends can he share them with?

Mathematical Language

Divide, equal groups, chunking, array, sets.

Anticipations

Solutions, Misconceptions

Task 9

Ali has $30 in five dollar notes. How many notes does he have?

Draw how you solved the problem.

Ali has 33 marbles. He wants to give his friends 3 marbles each. How many friends can he give marbles to?

Record how you solved the problem.

Teacher Notes

Before the launch, do a choral count in fives starting from 0. Record on the board like this:

5 10 15 20
25 30 35 40

Write up multiplication facts for the five times-tables.

Ask student to solve the multiplication facts and make connections between the choral count (skip counting) and multiplication facts

Have counters available for the students to use to model the problem.

Facilitate the students to notice that using structure and an array or relating the task to multiplication (groups of) is quicker and easier than counting or using trial and error.

Facilitate students to use structured ways of dividing.

This task focuses on repeatedly subtracting a group from a total number until nothing is left. This is called subtraction division or quotitive division.

For the independent task, have counters available.

Shareback

For the first task, select students to share who have either visualised six groups of five or have recalled that six 5s are 30. If no students have used these solutions, model this for them.

For the second task, select students to share who have either visualised three groups of 11 or have arranged the counters into an array using a 3 x 11 structure.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

There are patterns to the ways numbers are formed.

Objects in a set can be grouped in twos or fours to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

An array can represent a group.

Curriculum Links

Identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Recall multiplication and corresponding division facts for 2s, 3s, 5s, and 10s

Connect

How is division the same as the division in the earlier tasks?
How is division different than the division in the earlier tasks?
How can an array help you solve division and multiplication problems?

Support students to notice that both types of division problems involved partitioning objects into equal groups, however, with these division problems we knew the size of the groups and in the previous tasks, we knew the number of groups. In both kinds of division, multiplication can be used to solve the problems. Arrays can help solve division and multiplication tasks.

Suggested Learning Outcomes

Divide a set of objects by two and three.

Use grouping to solve division problems without counting each object.

Describe how an array represents a group.

Represent an array in a structured way.

Recognise and describe the relationship between multiplication and division.

Mathematical Language

Divide, equal groups, chunking, array, sets.

Independent Tasks

Ali has $24 in two dollar coins. How many coins does he have?

Record how you solved the problem.

Ali has $20 in five dollar notes. How many notes does he have?

Record how you solved the problem

Ali has 18 marbles. He wants to give his friends 6 marbles each. How many friends can he give marbles to?

Record how you solved the problem.

Ali has 20 marbles. He wants to give his friends 4 marbles each. How many friends can he give marbles to?

Draw how you solved the problem.

Anticipations

Solutions, Misconceptions

Task 10

Can you make these arrays using counters and draw them?

6 by 8

7 by 5

9 by 6

8 by 7

Record number sentences that use multiplication and division to match each one.

Teacher Notes

Have available counters for the students to make the arrays.

Support students to check whether their drawing matches the array. Ask students to redraw until the drawing and array match. Provide students with grid, or dot paper if needed.

Notice whether can verbalise the multiplication and division relationships and write corresponding number sentences.

For the independent task, have counters available.

Shareback

Select students to share who can use an array to represent the group and write matching number sentences. If no students write the number sentences, then model this for them.

Connect

Make an array for 12 by 4.
Write the matching number sentences.

Big Ideas

Objects in a set can be grouped and counted to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

There are patterns to the ways numbers are formed. Objects in a set can be grouped in twos or fours to get a final total.

Numbers can be grouped in an infinite number of ways - the number in a set stays the same no matter how it is arranged or represented.

An array can represent a group.

Curriculum Links

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Multiply a one- or two-digit number by a one-digit number, using skip counting or known facts (e.g. 4 × 6; 2 × 23)

Suggested Learning Outcomes

Use grouping to solve multiplication problems without counting each object.

Describe how an array represents a group.

Represent an array in a structured way.

Record number sentences using multiplication and division to match an array.

Independent Tasks

Sarah has 32 marbles.

Help her arrange them into rows that have the same amount in each.

How many rows can you make?

How many marbles are in each row?

Record your ideas using drawings and write the number sentences to match.

Mathematical Language

Times, multiply, equal groups, multiplication, lots of, divide, division, array.

Anticipations

Solutions, Misconceptions

Task 11

Shelley is decorating her birthday cake with her Dad with jellybeans.
First her Dad divides the cake into 2 sections.
Shelley has 22 jellybeans which she carefully shares fairly on each section.
How many jellybeans does she put on each section?
What fraction of the jellybeans does she put on each section?

Shelley is decorating her birthday cake with her Dad with jellybeans.
First her Dad divides the cake into 4 sections.
Ade has 28 jellybeans which she carefully shares fairly on each section.
How many jellybeans does she put on each section?
What fraction of the jellybeans does she put on each section?

Teacher Notes

Have equipment available for the students to model the situation.

Facilitate the students to notice that when you are talking about a set of jellybeans that the set is one whole and that they are finding a fraction of that set. Also, draw attention to the denominator as naming what the whole is divided into.

Notice students who can identify the relationship between finding a fraction of a set and division.

For the independent task, have jellybeans available for the students to use.

Shareback

Select students to share who have divided the sets of jellybeans using grouping, chunking, or structure rather than sharing individually.

Big Ideas

Numbers can be partitioned and combined to solve more complex addition and subtraction and simple multiplication and division problems.

Numbers can be represented in a variety of ways.

Equations show relationships of equality between parts on either side of the equal sign.

Patterns and relationships can be used, represented and generalised in a variety of ways.

Repeated addition is the same as multiplication.

Repeated subtraction is the same as division.

Curriculum Links

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Connect

Shelley notices a pattern, she thinks that dividing by two is the same as finding half of a set. Do you agree or disagree with her?

Test her conjecture with numbers and different materials and see what you think.

Suggested Learning Outcomes

Use equal sharing to solve division of sets of problems without counting every object.

Use grouping to solve problems without counting each object.

Identify the link between division and fractions.

Independent Tasks

Shelley is decorating her birthday cake with her Dad with jellybeans.
First her Dad divides the cake into 2 sections.
Shelley has 16 jellybeans which she carefully shares fairly on each section.
How many jellybeans does she put on each section?
What fraction of the jellybeans does she put on each section?

Shelley is decorating her birthday cake with her Dad with jellybeans.
First her Dad divides the cake into 4 sections.
Shelley has 20 jellybeans which she carefully shares fairly on each section.
How many jellybeans does she put on each section?
What fraction of the jellybeans does she put on each section?

Mathematical Language

Times, multiply, equals, multiplication, lots of, sets of, divide, half, division, quarter, fair share, fraction

Anticipations

Solutions, Misconceptions

Task 12

Which number sentences are true or false?

$10 \times 4 = 10 + 10 + 10 + 10$
$8 \div 2 = 6$
$10 = 2 \times 5$

$\frac{1}{2}$ of $8 = 2$
$3 + 3 + 3 + 3 + 3 + 3 = 3 \times 5$

$\frac{1}{2}$ of $20 = 10$
$20 \div 10 = 2$
$200 \div 100 = 2$
$\frac{1}{2}$ of $100 = 200$

Teacher Notes

Have concrete materials available but encourage students to use the relationships across the equals sign to decide whether the number sentences are true or false.

Notice whether the students are able to identify the relationship between fractions and division.

Shareback

Select students to share who can identify whether the number sentences are true or false by using the relationships across the equals sign.

Connect

What are the key ideas about multiplication and division that you have learned?
[Record this and put them on the maths wall]

Big Ideas

Numbers can be partitioned and combined to solve more complex addition and subtraction and simple multiplication and division problems.

Numbers can be represented in a variety of ways.

Equations show relationships of equality between parts on either side of the equal sign.

Patterns and relationships can be used, represented and generalised in a variety of ways.

Repeated addition is the same as multiplication.; Repeated subtraction is the same as division.

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?)

Count forwards or backwards in 1s, 2s, 5s, and 10s from any whole number between 1 and 100

Identify the relationship between skip counting and multiplication facts for 2s, 5s, and 10s

Multiply and divide using equal grouping or skip counting (e.g. in 2s, 5s, and 10s)

Suggested Learning Outcomes

dentify number sentences which are true and false involving multiplication and division.

Use relationships across the equals sign to identify whether number sentences are true or false.

Make conjectures about the properties of multiplication and division.

Independent Tasks

Select one of the following assessment tasks (attached at the end of the document) as the independent activity:

Task 1: Multiplication and division array.

Task 2: Multiplication and division problems to solve (Set A).

Task 3: Multiplication and division problems to solve (Set B).

Mathematical Language

Times, multiply, equals, multiplication, lots of, sets of, divide, half, division, quarter, fair share, fraction

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Multiplication and Division - Year 2

There are 48 children in the classroom. The teacher asks them to get into groups which are the same size.

Show all the different ways that they could get into groups. Record matching number sentences.

Assessment Task 3 - Multiplication and Division - Year 2

George had 5 sheets of stickers with 5 stickers on each sheet. How many stickers did he have altogether?

There are 28 shells to share fairly with four friends. How many shells does each friend get?

In the carpark there are 7 rows with 12 carparks in each row. How many carparks are there altogether?

Write your own multiplication or division problems. Show how you would solve them.

Assessment Task 3 - Multiplication and Division - Year 2

George had 6 sheets of stamps with 5 stamps on each sheet. How many stamps did he have altogether?

There are 24 strawberries to share fairly with four friends. How many strawberries does each friend get?

In the carpark there are 12 rows with 6 carparks in each row. How many carparks are there altogether?

Write your own multiplication or division problems. Show how you would solve them.