RICH MATHEMATICAL TASK BOOKLET

NUMBER Multiplication & Division

YEAR 0

Teacher Booklet

Task 1

Sunlou and Amaya are playing with tiles. They have two square tiles that are the same. They make a pattern, so the tiles join together.

Can you make a pattern with your tiles the same as they have?
Can you draw your pattern?

Now Sunlou and Amaya have 4 squares. Can you make a pattern out of the four squares so that each tile joins on two sides?

Can you draw your pattern?

Teacher Notes

Before you begin the task, support the students in a warm-up of counting collections in groups. Provide them with a bag of objects from the independent activity and ask them to work in pairs to count the collection in groups and record how they counted it.

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

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

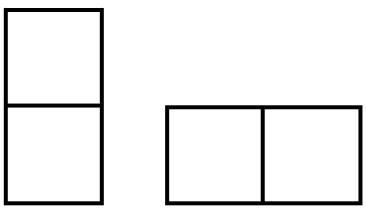
Ask students whether the horizontal and vertical representation is the same or different. Draw their attention to it being the same no matter which direction it is placed in.

Ask students to draw their grid representation and compare to the model. Repeat until drawing is accurate. The focus of this activity is for the students to develop structural thinking.

For the independent activity, provide students with bags of objects (counters, teddies, multi-link cubes) with up to 10 objects in the bag.

Shareback

Begin by selecting students to share the two different ways (horizontal, vertical) they have oriented the tiles.



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.

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

During the first 6 months

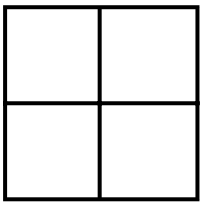
Partition up to 5 objects, and then up to 10 objects, using a systematic approach and noticing patterns

Join and separate groups of up to a total of 10 objects by grouping and counting

Shareback

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

For the second task, note the students who make a square out of the tiles and orient other student's attention to this. Ask all students to make a square out of the tiles.



Ask the students to draw a representation of the square and note students who draw this in a structured way.
Have students practice drawing this until it is accurate.

Connect

Remove the tiles and ask students to draw on a blank piece of paper what the four squares would look like when placed together to make a large square.

Suggested Learning Outcomes

Represent a grid in a structured way.

Independent Tasks

Choose each bag and count in groups how many objects are in the bag.

Record how you counted the objects.

Mathematical Language

Squares, side, row, column, horizontal, vertical.

Anticipations

Solutions, Misconceptions

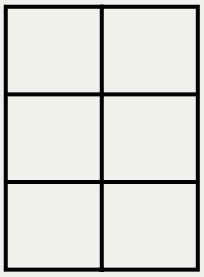
Task 2

I have made a large grid:

How did I make this? What could we call it?

Make the grid using the square tiles.
How many tiles did you need? Record this.

I have made another grid:



How many squares in this grid?
How is it related to the first grid?
Make the grid using the square tiles.

Copy both grids and draw these.

Teacher Notes

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

During first task progression, facilitate the students to replicate the grid using the squares or tiles and count these in a group.

Support students to use language to describe groups of in their explanations.

Draw student attention to the grid being the same no matter which direction they are placed.

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

The focus of this activity is for the students to develop structural thinking. For the independent activity, have squares, tiles, and ice-block sticks.

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

During the first 6 months

Join and separate groups of up to a total of 10 objects by grouping and counting

During the first year

Subitise (recognise without counting) the number of objects in a collection of up to 10, including by combining two patterns of 1–5 objects

Partition up to 5 objects, and then up to 10 objects, using a systematic approach and noticing patterns

Shareback

For the first task, begin by selecting students to share who have counted the squares in groups and described the grid as having six squares because it has either two groups of three or three groups of two. If no students, describe it in this way then introduce this language and description to the students. Model how to record this.

For the second task, select students to share who notice that the grid has the same number of squares without counting but is in a different orientation.

When students have drawn the grid representation, ask them to compare it to the model. Repeat until the drawing is accurate.

Connect

Remove the grids and ask students to draw on a blank piece of paper what both grids looked like. Ask students to describe how what they have drawn is the same or different to the grid. Ask them to draw it again from memory until it is accurate.

Suggested Learning Outcomes

Describe an array in multiplication.

Recognise similar arrays in multiplication.

Represent a grid in a structured way.

Independent Tasks

Sunlou and Amaya are playing with tiles. They have four square tiles that are the same. They make a pattern so the tiles join together on two sides.

Make the pattern with your tiles.

Use the ice-block sticks to make the pattern.

Draw what the pattern looks like.

Make your own pattern with 4 tiles.

Use the ice-block sticks to make the pattern.

Draw what the pattern looks like.

Mathematical Language

Squares, side, row, column, horizontal, vertical, groups.

Anticipations

Solutions, Misconceptions

Task 3

Bobbi and Leesa are playing with tiles. They have six 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 3 by 3
A grid that is 2 by 4
A grid that is 4 by 3

Teacher Notes

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.

Shareback

Begin by selecting students to share the two different ways (horizontal, vertical) they have oriented the tiles. Model describing the groups of tiles using language such as 6 by 1, 2 by 3, 3 by 2, 1 by 6.

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

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

During the first year

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

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

Draw these grids first and then make them with the ice-block sticks.

A grid that is 2 by 5
A grid that is 4 by 2
A grid that is 3 by 3
A grid that is 5 by 2

Mathematical Language

Squares, side, row, column, horizontal, vertical, groups.

Anticipations

Solutions, Misconceptions

Task 4

How many dots are there?

Draw a picture of the array and record the numbers you used to find the number of dots.

Teacher Notes

Begin by using a blank tens frame.

Ask the students how many squares there are in total by imagining pulling the tens frame apart into a number of identical pieces.
Ask, what is the quickest way to do this?

Show students a 3 by 3 array of dots. Ask the students to imagine how to pull this apart to find the total number of dots.

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 sort using groups. Highlight this to all students. Model how to use number sentences to record the groupings.

For the independent activity, have counters available.

Shareback

For the tens frame, select students who represent the ten as five columns of two or two columns of five squares. If no students suggest this, then model how the ten could be represented in this way.

For the 3 by 3 array, select students to share whose solutions have used groups. Record the solutions.

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

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

During the first year

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

Connect

Can you draw two arrays of dots to represent 4 by 3. Use small dots for one and big dots for the other.

What is the same and what is different?

Suggested Learning Outcomes

Describe how 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.
Describe how an array represents a group.
Represent an array in a structured way.

Independent Tasks

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

3 by 2
3 by 3
4 by 2
2 by 5
3 by 5

Mathematical Language

Number words, row, column, array, multiply.

Anticipations

Solutions, Misconceptions

Task 5

Talia loves to count. Can you help her count how many cakes she has altogether in the quickest way you can?

What about if she sees more? Can you help her count how many she sees this time?

Teacher Notes

Before you launch the task, introduce the students to a choral count by twos ... start from zero and record as:

0 2 4 6 8
10 12 14 16 18...

Support the students to notice the patterns when counting by twos and generalise that the ones digit will always be 0, 2, 4, 6, 8

Have unifix blocks or multilink cubes. Have the cubes linked together in alternate colours and sets of two. (e.g., one red, one white repeatedly). For the first problem have six cubes altogether. Get the students to use their cubes to replicate your pattern of 6 cubes with three of each colour. Help the students to see that the cakes are made of chunks each chunk consisting of one cube of each colour. Call each chunk the unit of repeat.

Repeat the exercise with 10 linked cubes then repeat with 14 cubes.

Facilitate the students to notice how many cubes there are that represent the cakes altogether and how many cubes there are of each colour using chunking. Chunking is an important step towards grouping rather than counting by ones.

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

For the independent task, you will need the problems below and objects for students to count.

Shareback

Select students to share who are able to explain the chunking by two and use this to count by two rather than one to one.

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

During the first year

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

Connect

Draw a picture of the ten cakes Talia sees. Now draw circles around each group of two cakes.

Suggested Learning Outcomes

Count in groups.

Group objects to 10 in different ways.

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

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

Independent Tasks

Martha and Milli are playing with pinecones.

What is the quickest way they could count all of the pinecones?

What if they see more?

Can you help them count how many they see now?

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 6

Iosefa collects marbles. He decides that he wants to see how many marbles he has collected.

Can you help him?

Teacher Notes

Before you launch the task, introduce the students to a choral count by twos ... start from one and record as:

1 3 5 7 9
11 13 15 17 19...

Support the students to notice the patterns when counting by twos and generalise that the ones digit will always be 1, 3, 5, 7, 9 - introduce the term odd number.

Have unifix blocks or multilink cubes. Have the cubes linked together in alternate colours and sets of two. (e.g., one red, one white repeatedly). For the first problem have eight cubes altogether. Get the students to use their cubes to replicate your pattern of 8 cubes with 4 of each colour. Help the students to see that the marbles are chunked and each chunk represents one cube of each colour (could be described as a blue and a green marble). Call each chunk the unit of repeat.

Repeat the exercise with 12 linked cubes.

Facilitate the students to notice how many cubes there are that represent the marbles altogether and how many cubes there are of each colour using chunking. Reinforce that chunking in twos is an important step towards grouping rather than counting by ones.

Notice the students who use 'lots of' to describe the chunks and reinforce this language and model with words for the students.
For the independent task, use round counters to represent the cards and shells. Have bags of counters with between 12-16 counters for students to choose.

Shareback

Select students to share who are able to explain the chunking by two and press the students to use this to count by two rather than one to one.

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

During the first Year

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

Connect

Have students draw their own pictures of the model and circle the groupings of two.

Suggested Learning Outcomes

Use grouping to solve multiplication problems without counting each object.

Count in groups.

Group objects to 10 in different ways.

Describe how an array represents a group.

Represent an array in a structured way.

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

Independent Tasks

Jason and Niu are sorting their cards.

What is the quickest way they could count all of their cards?

What if they find 2 more?
Can you help them count how many they have now?

Nola and Shaz are counting their shells.

What is the quickest way they could count all of the shells?

What if they find 4 more?
Can you help them count how many they have now?

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 7

Hana and Sima are sharing a bag of 12 jellybeans. If they shared them fairly, how many would they each get?

Show how you can solve the task in different ways.

If Leon 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 doubles on the board up to 5 and ask the students to solve the equations

1 + 1 =
2 + 2 =
3 + 3 =
4 + 4 =
5 + 5 =

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

For the launch have counters under a card and let children see them for only 3 seconds before covering them (so they do not have time to count them) and ask them how many counters they saw. Place the counters in groupings of two rather than randomly.

Have counters or jellybeans 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.

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

During the first year

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

Teacher Notes Continued

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 jellybeans available.

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 jellybeans. 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 jellybeans out 1 or 2 at a time.

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

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

Students may make a 2 by 6 array showing two groups of 6 (structured).

Students might recall that two 6s make 12 (structured).

Connect

Draw a picture of how you shared the 12 jellybeans 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 12 jellybeans fairly between 5 children?

Mathematical Language

Divide, equal groups, chunking, array, sets.

Suggested Learning Outcomes

Divide a set of objects by two and three.

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

Hana and Sima are sharing a bag of 8 jellybeans. 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 8 jellybeans, how many would they each get?
Draw how you solved the task using an array.

Hana and Sima are sharing a bag of 6 jellybeans. 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 6 jellybeans, how many would they each get?
Draw how you solved the task using an array.

Mathematical Language

Divide, equal groups, chunking, array, sets.

Anticipations

Solutions, Misconceptions

Task 8

There are 10 tama in the sasa group. The faiaoga wants them to sit in five equal groups. How many tama will be in each group?

What if the faiaoga only wanted them to sit in two equal groups? How many tama would be in each group?

There are 9 tama in the drumming group. Each tama plays one instrument – a large drum, a shaker, or a small drum. The same number of tama play each instrument. How many tama play each instrument?

Teacher Notes

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

2 4 6 8 10
12 14 16 18

Ask the students to identify the patterns in the count.

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.

Facilitate students to use structured ways of dividing.

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 five groups of two or have arranged the counters into an array using a 2 x 5 structure. This structure will also help them see that if there were only 2 groups, there would be 5 in each. If no students have used an array, model this for them.

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

During the first year

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

Multiply and divide using equal grouping or counting

Shareback

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

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 3 are 9 then you also know that 9 divided by 3 is 3.

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 five 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.

Independent Tasks

There are 14 tama in the sasa group. The faiaoga wants them to sit in two equal groups. How many tama will be in each group?

What if the faiaoga only wanted them to sit in two equal groups? How many tama would be in each group?

There are 12 tama in drumming group. Each tama plays one instrument – a large drum, a shaker, or a small drum. The same number of tama play each instrument. How many tama play each instrument?

Mathematical Language

Divide, equal groups, chunking, array, sets.

Anticipations

Solutions, Misconceptions

Task 9

Teejay has 12 jellybeans. He wants to share them with his friends and give them 2 each. How many friends can he share them with?

How many friends could Teejay share his jellybeans with if he decides to give them 3 each instead?

How many friends could Teejay share his jellybeans with if he decides to give them 4 each instead?

Teacher Notes

Before you launch the task, introduce the students to a choral count by twos ... start from one and record as:

1 3 5 7 9
11 13 15 17 19...
Support the students to notice the patterns when counting by twos and generalise that the ones digit will always be 1, 3, 5, 7, 9 - introduce the term odd number

Have available counters or jellybeans 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.

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 jellybeans. 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.

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

During the first year

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

Multiply and divide using equal grouping or counting

Shareback continued

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 jellybeans out 2 at a time.
Students may count the jellybeans in 2s and keep track of the groups they counted.
Students may make a 2 by 6 array showing six groups of 2 (structured).
Students might recall that six 2s make 12 (structured).

Connect

Draw a picture of how you shared the 12 jellybeans 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 was the same and different when you shared the jellybeans out by 2, 3, and 4?

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

Teejay has 6 jellybeans. He wants to share them with his friends and give them 2 each. How many friends can he share them with?

How many friends could Teejay share his jellybeans with if he decides to give them 3 each instead?

Teejay has 8 jellybeans. He wants to share them with his friends and give them 2 each. How many friends can he share them with?

How many friends could Teejay share his jellybeans with if he decides to give them 4 each instead?

Mathematical Language

Divide, equal groups, chunking, array, sets.

Anticipations

Solutions, Misconceptions

Task 10

Lotu has $10 in two dollar coins. How many coins does she have?

Draw how you solved the problem.

Lotu has 9 marbles. She wants to give her friends 3 marbles each. How many friends can she give marbles to?

Draw how you solved the problem.

Teacher Notes

Have counters available or jellybeans 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.

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.

Shareback

For the first task, select students to share who have either visualised five groups of two or have recalled that five 2s are ten. 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 three or have arranged the counters into an array using a 3 x 3 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.
An array can represent a group.

Curriculum Links

During the first year

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

Multiply and divide using equal grouping or counting

Anticipations

Solutions, Misconceptions

Task 11

Can you make these arrays using counters and draw them?

3 by 2

3 by 3

4 by 2

2 by 5

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 3 by 5.

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.
An array can represent a group.

Curriculum Links

During the first year

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

Multiply and divide using equal grouping or counting

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

Sepi has 12 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?

Mathematical Language

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

Anticipations

Solutions, Misconceptions

Task 12

Timo is playing with his shell collection. He wants to make up pairs of shells. He has 5 shells. When he puts them into pairs, he has one left over.

If he has 6 shells, how many pairs can he make?

Can you find out which groups of shells (from 7-12) can be put into pairs without any left over?

Record your solutions using drawing and number sentences.

Teacher Notes

Have available counters and a number line for the connect.

Facilitate the students to notice that counting in groups of two is a pattern.

Expect students to represent their reasoning using the counters and by building arrays of two.

Notice whether students make a connection between the task and odd and even numbers.

Shareback

Select students to share who have represented using an array to show that groups with even numbers can be shared in twos. If no students have used an array, then model this for them.

Connect

Show the students arrays and then introduce a number line from 0 to 20.

Ask them to circle the numbers that could be divided into pairs (groups of two). Ask them to predict which numbers beyond 14 could also be divided into pairs.

What types of numbers are these? [even numbers].

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

During the first year

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

Multiply and divide using equal grouping or counting

Suggested Learning Outcomes

Divide a group by two.

Describe how an array represents a group.

Represent an array in a structured way.

Independent Tasks

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

Task 1 : Multiplication and Division

Task 2 : Multiplication and Division

Mathematical Language

Division, divide, pairs, groups of, equal groups, array, odd, even.

Anticipations

Solutions, Misconceptions

Assessment Task 1 - Multiplication and Division - Year 0

There are 10 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.

Use arrays and number sentences to represent your answers.

Assessment Task 2 - Multiplication and Division - Year 0

You have 12 marbles and put them into groups which are the same size.

Show all the different ways that you could put them into groups.

Use arrays and number sentences to represent your answers.