

GROWING

Mathematically

Multiplicative Thinking

Teaching Tasks
(Zone 1)

Zone 1 Activities

The tasks listed on the initial page(s) are rich tasks from **reSolve** and **Maths300** that may be used with multi-zone groups. The tasks that follow these pages are suitable for students who are working in Zone 1.

reSolve

Counting Handfuls: (Trusting the Count)

Number: *One is a Snail* (Trusting the Count)

Addition: *Partitioning* (Trusting the Count and Mental Strategies for Addition and Subtraction)

Counting: *Handfuls* (Skip Counting)

Skip Counting: *How Many Birds?* (Skip Counting); *Grandma's Soup* (two-digit Place Value)

Place Value: *Number Sorting* (two-digit Place Value)

Counting: *Large Collections* (two-digit Place Value and efficient and reliable strategies for counting large collections and 3-digit place value); *Place Value Cards* (two-digit Place Value and three-digit Place Value); *Bunches of Balloons* (How to make, name and use arrays)

Multiplication: *Making Robots* (How to make, name and use arrays); *reSolve Fruit Shop* (How to make, name and use arrays)

Assessing Reasoning: *Is it true?* (Efficient and reliable strategies for counting large collections)

Maths300

Nine and over: Zones 1 – 3

This task is designed to be revisited regularly to continue to develop deep understanding of place value through a continuous concept development approach. There is software available to support the conceptual development as well as additional place value resources.

Number charts: Zones 1 – 4

This task covers additive strategies in Zones 1 and 2 and multiplicative strategies in Zones 3 and 4. The task seamlessly connects the inverse operations and uses reasoning strategies. Connects to Fractions and Fraction Charts and Algebra Charts.

Highest number: Zones 1 – 3

This task starts out as a simple, well-known place value game with cards, but develops into many other learning outcomes, including statistics and probability.

Making 1000: Zones 1 – 2

This task uses concrete materials to explore the number of ones, tens and hundreds in a thousand. It lays the foundation of the multiplicative nature of place value and extends into square and cube numbers

SUBITISING – SEEING IT ALL

Specific teaching focus

To consolidate **subitising** by establishing the ability to recognise, and say, how many in a collection up to 5 without counting and by introducing part-part-whole understanding for numbers to 10.

Materials/resources required

- Set of subitising cards for the numbers 1–5
- Additional set of subitising cards for collections to 10

How to implement

1. Teacher presents subitising cards one at a time, to students asking, “*How many dots are there?*”

These are shown relatively quickly, for 1–2 seconds, so the dots are not visible long enough to be counted individually.

Proceed through each card, asking “*What do you see? How do you know?*”

E.g. “*I can see 3 because there’s a 2 and a 1.*”

Repeat the above procedure with the additional set of subitising cards for collections to 10, using subitising and part-part-whole understanding.

E.g. “*I see 5 and 2 so there are 7 dots.*”

TRUSTING THE COUNT

Specific teaching focus

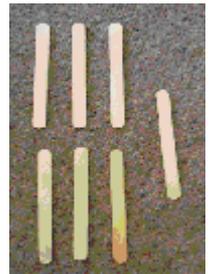
To consolidate **trusting the count** by establishing the ability to recognise the numerosity of numerals to 10, without having to model or count-all or recount the whole collection, using the count-on from larger strategy.

Materials/resources required

- Paddle-pop sticks or age appropriate concrete materials for bundling and counting
- Plastic cups

How to implement

1. Place a group of less than 10 paddle-pop sticks on the floor. E.g. 7.
2. Ask students, "How many are there? What do you see? How do you know?"
3. Then pick them up and place them in a cup.
4. Place another group of paddle-pop sticks (3 or less) on the floor. Ask students, "how many are there now?"
5. Ask the students, "How many would I have altogether if I put these into the cup with the others?"
6. Having to find the total number of paddle-pop sticks in the cup without recounting them all individually will encourage 'trusting the count'.
7. E.g. For 7 think 8, 9, 10.
8. Continue adding 1, 2 or 3 paddle-pop sticks for collections up to 20.



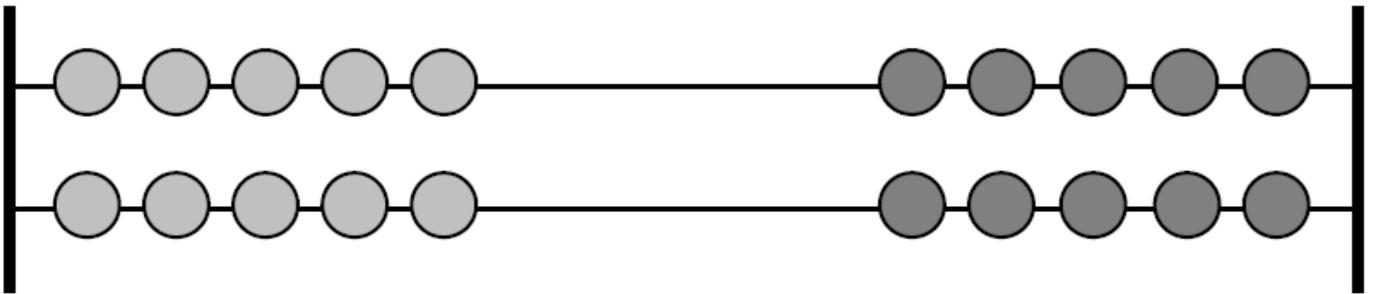
BEAD FRAME DOUBLES

Specific teaching focus

To consolidate mental strategies for **addition** and **subtraction** by establishing doubling.

Materials/resources required

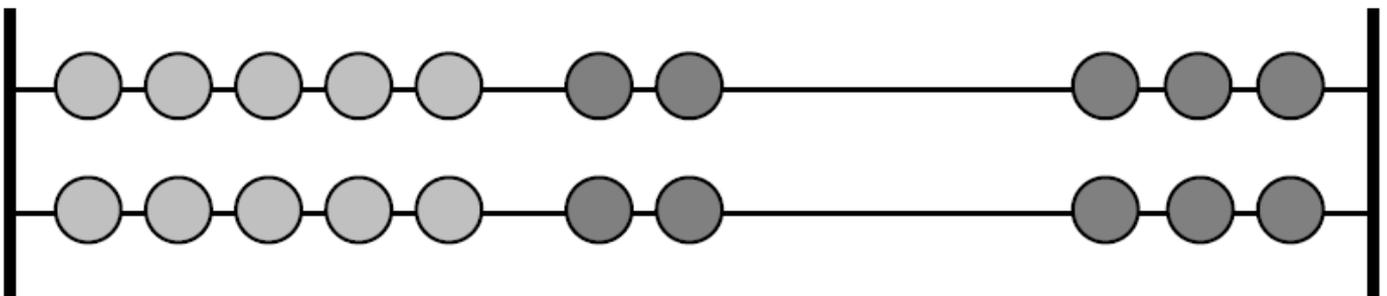
2-row bead frames (see below) (The bead frames need to have 2 rows with 10 beads on each row, 5 of one colour and 5 of another colour)



Ten-frames

How to implement

1. Teacher chooses a number, e.g. 7, and ask students to show doubles of that number on their bead frames, double 7 (see below).



If set out like this on a bead frame, the students can easily see that 'double 7' is a 10 and 4 more, that is 14. Ten-frames can also be used to explore this strategy.

Explore this concept with double 6, 7, 8 and 9.

DICE DOUBLE

Specific teaching focus

To consolidate **mental strategies for addition and subtraction** by establishing doubles, part-part-whole knowledge, make to ten and place value based strategies.

Materials/resources required

- 6 sided & 10 sided dice
- Blank 10 x 10 grids

How to implement

1. Students, in pairs, roll a 6-sided dice and double the number rolled, recording their results on the 10 x 10 grid.

E.g. If a 4 is rolled, students double it, 8: shade in 8 squares and record 8 in the appropriate cell. If their next throw is a 3, they double 3, 6 and use an efficient strategy, e.g., to find 8 and 6 more: 8 and 2 is 10 and 4 more, 14.

							8		
			14						

Encourage students to use other strategies including place value strategies. E.g. If 6 is thrown next, 12 needs to be added to 14. Think: 14 and 10 more, 24 and 2, 26.

							8		
			14						
			24		26				

2. The 10x10 grid is used to record each turn. Encourage students to use efficient strategies to determine where they will shade after each throw of the dice, rather than just counting and shading by ones.
3. The first to 100 wins. Discuss, "Is it possible to get to 99 on the grid?" Discuss that doubling whole numbers always gives an even number.

Note: A 0-99 number chart if used in this activity is problematic as the zero space is counted as 1 which leads to a miss count. For the example above, recording 8, would actually be numbered 7 (see below).

0	1	2	3	4	5	6	7		
---	---	---	---	---	---	---	---	--	--

NUMBER LINE JUMP

Specific teaching focus

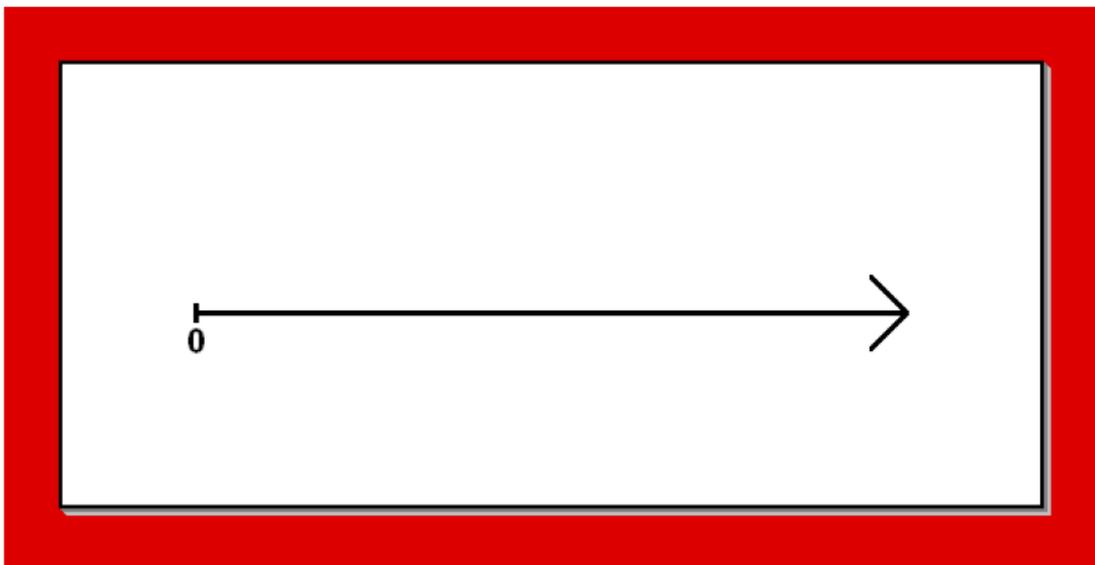
To consolidate **mental strategies for addition and subtraction** by establishing count on from larger, double and near doubles and make to ten strategies.

Materials/resources required

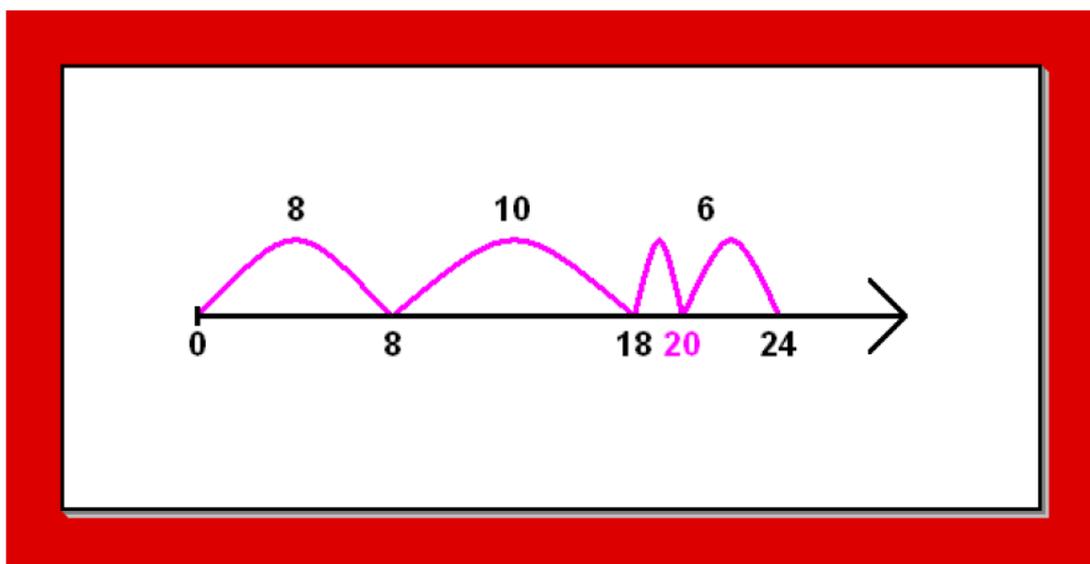
- White board markers and white board
- 6 sided & 10 sided dice

How to implement

1. Teacher at the white board draws an unlabelled open number line.



2. Each student takes a turn rolling a 10 sided dice and the teacher begins by making the jump on the number line that represents the number rolled



For the example pictured above, the first throw is 8 and the next throw is a 10, using place value strategies, 8 and 10 more is 18. The next throw is 6, using part-part-whole strategies and make to 10, student would say 18 and 2 is 20 and 4 more 24.

Ask individual students to use efficient strategies, eg, part-part-whole, doubles, near doubles, place value in relation to tens, for each new number rolled.

Show the proportion of the jump according to the size of the number. After reaching a pre-designated number, the teacher can pass the white board marker to a student who can then be in charge of estimating the size of the jumps according to the number that was thrown.

Follow up suggestions

This activity can be applied in the same way for subtraction. E.g. By starting at a given number and take-away according to the roll of the dice continuing using efficient strategies such as make back to ten.

SEARCHING FOR STRAWS

Specific teaching focus

To consolidate **2 digit** place value by establishing the ability to work flexibly with ones and tens through making, naming and recording.

Materials/resources required

- Large collection of straws or paddle-pop sticks

How to implement

1. Students sit in front of the teacher in a circle (small group or whole class) and take a handful of straws/paddle-pop sticks and count them out.
2. Teacher asks students for an efficient way to count them, i.e. grouping them in fives or tens. Discuss the value of working with bundles of ten. Students experience bundling objects into tens and recording as appropriate. Scaffold by using a model similar to below (look at bundles in terms of place value parts).

tens	ones

3. Repeat this process a number of times, using different sized handfuls (make).
4. Students name these numbers. E.g. “4 tens and 3 ones, forty three.”
5. Then students record. E.g. “43”.

Follow up suggestions

Encourage students to rename collections in a variety of ways.

E.g. A collection of 24 straws is:

2 tens and 4 ones.

1 ten and 14 ones.

or 24 ones.

MODELLING MAB

Specific teaching focus

To consolidate **2 digit place value** by establishing the ability to work flexibly with ones and tens to make, name, record, compare and order.

Materials/resources required

- MAB
- 10 sided dice

How to implement

1. To make, name, and record numbers to 99. Ask students to model (make) a number, eg. "35" using the MAB. Name the number, e.g., "3 tens and 5 ones, *thirty five*" and record, "35". Give students another example. E.g. "Make me 4 tens and 2 ones", and again ask students to make, name and record.
2. Repeat this using various numbers, including zero in the ones place. Students then make their own number and record it on paper and share with the class.
3. Students should be given the opportunity to compare the numbers they make with each other, e.g., 54 and 45, "45 is smaller because even though there is 1 more in the ones there is 1 less in the tens".
4. Encourage students to order (smallest to largest and visa-versa) and rename the numbers they have made in as many ways as possible.

E.g. 42 is:

4 tens and 2 ones.

3 tens and 12 ones.

2 tens and 22 ones.

1 ten and 32 ones.

42 ones.

Follow up suggestions

Students throw 2 ten sided dice and decide which numeral they would like to make. E.g. If a 6 and 3 are thrown they can make 63 or 36. Again students can make, name, record, compare and order their numbers.

PUZZLING PLACE VALUE

Specific teaching focus

To consolidate 2 digit place value by establishing the ability to work flexibly with ones and tens, through comparing, ordering and counting forwards and backwards in place value parts.

Materials/resources required

- 0-99 number chart
- Cardboard templates of various shapes (see below for an example)
- Blue-tac
- Coloured counters
- 10-sided dice

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24		26	27	28	29
30	31	32	33			36	37	38	39
40	41	42	43		45	46	47	48	49
50	51	52	53	54	55	56	57	58	59

How to implement

1. Place a cardboard template over a small area on the 0-99 number chart (see above).
2. Ask students to suggest which numbers are covered up and how they know. E.g. if 34 and 44 are covered, ask them to explain how they know what they are (i.e. they can see 24 so the one underneath is 10 more).
3. Use a variety of template shapes and cover various sections of the 100 squares and discuss.
4. Discuss different methods of working out the same missing number.

Follow up suggestions

Laminate the 0-99 chart, cut into puzzle pieces and have students reconstruct the chart. Have a 0-99 number chart with numbers missing for student to complete (see below).

0	1	2	3	4	5	6			9
			13	14	15				19
20			23	24	25	26			
30			33	34	35	36			
40			43	35	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59

MAGIC BEAN TOSS

Specific teaching focus

To consolidate **part-part-whole knowledge** by establishing the ability to see and recognise a number in terms of its parts. E.g. the ability to see 8 in terms of: 4 and 4, or 5 and 3 more, or 2 less than 10, etc.

Materials/resources required

- Magic Beans (lima beans with one side sprayed gold)

How to implement

1. Teacher grabs a small handful of magic beans (less than 10) and tells students, "*I've got ... beans.*"
E.g. "*I've got 8 beans.*"
Throw them on floor and look at the number of white beans and the number of gold beans. Count and discuss what students notice. Repeat.
2. In particular, discuss part-part- whole knowledge, for example, the number 8, 1 gold and 7 white, 2 and 6, 3 and 5, 4 and 4.

Students should then, in groups, repeat this activity with some beans, to build knowledge of part-part-whole for their collection of beans.

Exploring part-part-whole

Learning goal

To consolidate part-part-whole knowledge by establishing the ability to see and recognise a number in terms of its parts.

1. Collect **10 counters** and arrange them on two ten-frame cards.

How many different ways can this be done?

Use a highlighter to show the different ways on the ten-frames below.

2. Use 7 counters and explore the ways 7 can be shown. Show all these below.

3. Show all the ways 8 can be shown.

4. Show all the ways **5** can be shown.

5. Show all the ways **4** can be shown.

6. Show all the ways **6** can be shown.

7. Show all the ways **9** can be shown.

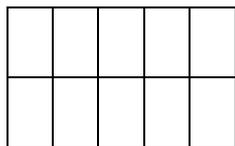
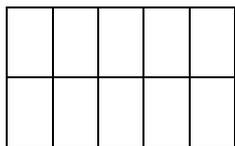
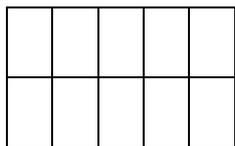
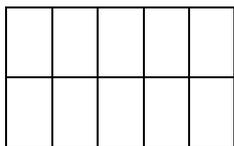
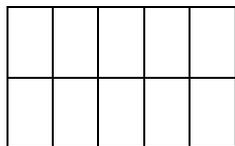
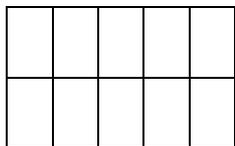
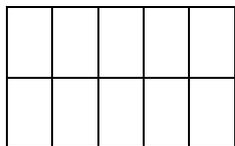
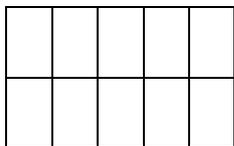
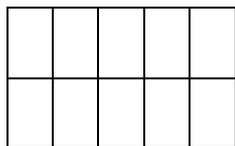
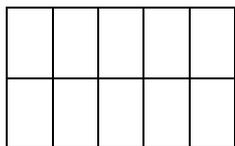
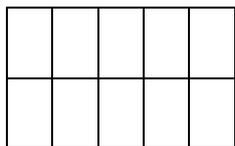
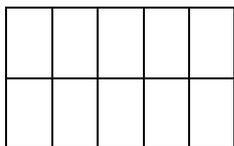
4. Draw 8 of the ways **eight counters** can be arranged.

5. Draw four of the ways **nine counters** can be arranged.

6. Draw 8 of the ways 4 counters can be arranged.

7. Draw 8 of the ways **3 counters** can be arranged.

8. Draw 8 of the ways **2 counters** can be arranged.



PICKING THE PLUGS

Specific teaching focus

To consolidate simple skip counting by establishing the ability to see groups up to 5 as countable objects. E.g. counts by 2s, 5s, etc.

Materials/resources required

- 2 Poly Plug (See photos below)



- 1 cloth for teacher to cover the plugs
- 1 pack of subitising cards 1 – 5
- A4 2cm square grid paper
- Six sided dice

How to implement

1. Use the poly-plug board and ask two students to turn over 4 plugs in each row (5 fours).
2. Ask these two students to bring their boards to the front and line them up on the floor (now 10 fours).
3. Cover all the plugs with the cloth. Seat students in front of the boards so that they can clearly see the columns and rows. Ask the students, "*I am going to slide this cover back just one row. How many blue plugs will I show?*" Ask for an answer, then slide back to reveal.
4. Progressively reveal the rows asking the students, "*how many? How many now?*"

ADDITION SNAP

Learning focus

To **consolidate mental strategies for addition and subtraction** by establishing doubling, making to 10, part-part-whole and place value strategies, count on from larger.

Materials/resources required

- Cards (without the J, Q, K)

How to implement

- In pairs collect a deck of cards. Remove the picture cards (King, Queen, Jack) and put these aside.
- Shuffle the remaining cards. Divide the deck in half and put the two decks side by side. Each student has one deck each.
- Students turn the first card on top of their deck **at the same time**.
- The first person who adds the cards collects both cards.
- Turn over another card etc. adding the cards to collect them.
- Keep playing until the deck is gone.
- Count how many cards were collected per student, whoever has the most wins the game.

Reflection

What strategies did you use for adding the numbers together?

Extension/variation

- Play the same game, this time subtracting the cards instead of adding them.



DOMINO LINE UP

Purpose

To discover the different dominoes in a pack

1. In pairs, place the whole set of dominoes end to end in a straight line so that each domino in the line matches. (e.g. 3-6, 6-1, 1-4)
2. Note the two numbers at the ends of the line.
3. Try making a different line, starting with a different piece. What do you notice about the numbers at the ends of the line? Can the dominoes be linked to form a circle?



ADD TO 20

Purpose

To use a system to solve a problem.

1. Find pairs of dominoes that add to make 20 (The dominoes do not need to match to join). Write down your combinations in your book.
2. How many different pairs may be found?
3. How do you know you have found all of them? Show your teacher how you used a systematic way to find all the pairs.
4. Now try to find pairs of dominoes that add the make 15. Write them in your book.
5. How many different combinations may be found?

DOUBLES AND NEAR DOUBLES

Activity 1

1. Make two towers of 4 blocks each.
double does this show?

Record in your book "Double 4 = _____"

Now make two towers with 5 blocks in each tower.

Record in your book "Double 5 = _____"

2. Now make towers of 6 blocks. How could you double 6 if you know how to double 5?

Record in your book "Double 6 = Double 5 + Double _____ = _____"

3. Now do the same with 7 blocks in a tower

Record in your book "Double 7 = Double 5 + Double _____ = _____"

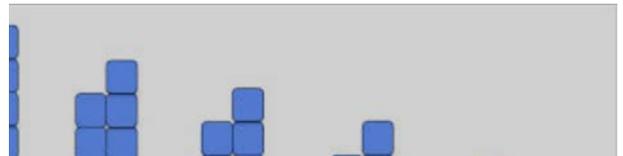
4. Do the same for double 8, 9 and 10



What

Activity 2

1. Place the number cards face down and select a number. Record your number on the worksheet provided
2. Build the double fact for the number with two towers of cubes
3. Add one more cube to one of the towers to create a near-double and record the fact on the worksheet.
4. Record the turn-around fact for the near-double e.g., Near-double 2 + 3, turnaround 3 + 2



Activity 3

1. Build a tower of 4 blocks. Now build a tower of 6 cubes. What do you notice about the difference in heights of the towers?
2. What happens when you move 1 cube from the taller tower to the other tower?
3. Using your knowledge from Activity 2, find the total number of cubes in the two towers. DO NOT COUNT EACH CUBE!!
4. Now build towers of 6 and 8 cubes. What is the difference in heights of the towers?
5. What happens when you move 1 cube from the taller tower to the other tower?
6. Find the total number of cubes in the two towers.
7. Explain how you could add 5 and 7 together using your knowledge of doubles?
8. Find the answer to the following. Show working out

E.g. $3 + 5 = 4 + 4 = 8$

$2 + 4$

$7 + 9$

$9 + 11$

$10 + 12$

MAKE TO TEN

Purpose

To mentally practise calculating pairs of numbers that add to ten.

Materials

- One six-faced dot dice per group of players/ 20 sided dice
- One game board per group

Aim

To correctly answer the most combinations to ten or multiples of 10.

Rules

1. Players take turns to roll the dot dice and record the number in the left column
2. The player writes down the number that is required to make ten in the right hand column
Play continues for 10 rounds
3. Players mark the combinations that are correct. For each combination that is correct, the numbers in the right hand column are added and the player with the largest total wins.

Example

3	7
1	

1. Play the game again, but this time use a twenty-faced dice and make to 30.

Example

13	17
16	

ADDITION SNAP



Learning focus

To **consolidate mental strategies for addition and subtraction** by establishing doubling, making to 10, part-part-whole and place value strategies, count on from larger.

Materials/resources required

- Cards (without the J, Q, K)

How to implement

- In pairs grab a deck of cards. Remove the picture cards (King, Queen, Jack) and put these aside.
- Shuffle the remaining cards. Divide the deck in half and put the two decks side by side. Each student has one half deck each.
- Students turn the first card on top of their pile **at the same time**.
- The first person who adds the cards correctly collects wins both cards and puts them in a pile at their side.
- Turn over another the next card in your pile and repeat.
- Keep playing until the deck is gone.
- Count how many cards were collected per student, whoever has the most cards wins the game.

Extension/variation

- Play the same game, this time **subtracting** the cards instead of adding them. This is sometimes called Subtraction War.

ANIMAL LEGS

Learning focus

To group collections in twos and fours and repeat addition and skip counting. To record a number sentence to reflect drawing to show evidence of multiplicative thinking.

Materials/resources required

- Animal legs hand out sheet per student

How to implement

1. The animal legs handout has 20 legs on one side and a fence on the other. Fold the fence over the legs.
2. Draw as many animals as you can to the legs on the sheet.
3. Write a number sentence to reflect your drawing.

Extension variation

Learning focus

Use Simple Skip counting or basic arrays to determine the size of a regular collection E.g. count by 2s, 5s, 10s.

Materials/resources required

- A deck of cards

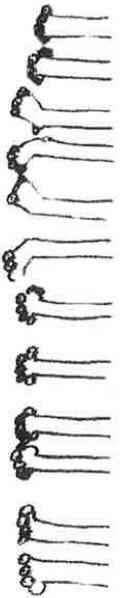
How to Implement:

- In pairs grab a deck of cards. Remove the picture cards (King, Queen, Jack) and put these aside.
 - Set up a table in your project books to record the two players names

Bob	Joe

- Shuffle the remaining cards. Divide the deck in half and put the two decks side by side.
- Turn around one card, then the other.
- The first person who adds the cards first receives a point in the table.
- Turn over another card etc. adding the cards to gain a point.
- Keep playing until the deck is gone.

TASK 5 SHEET 2



DICE DIGITS

Required materials

- Dice Digits record sheet
- 10 sided dice

Learning focus

Mental Strategies for addition and subtraction facts to 20. E.g. count on from larger, use doubles, near doubles, halving and make 10. Develop a greater understanding of place value up to hundreds.

Instructions

- Roll the die – each player must use the same score on the dice – so take turns in rolling the dice. The die is rolled and the number placed in the box on the top row of the record sheet. When the die is rolled a second time the number may be placed in either the first or second box of the second row of the record sheet.
- You must fill the entire row BEFORE moving on the next row.
- When all spaces in the boxes are filled, add up the game total WITHOUT using a calculator.
- Write the total of each game in WORDS E.g. 137 is one hundred and thirty seven.
- For each game write the totals of each person in the group in order from highest to lowest.
- The winner is the person with the largest total.
- One game is not enough you should complete at least 4 FULL games and include all recording.

Extensions

1. Try to make the smallest possible total.

ONE HUNDRED OR BUST

Learning focus

To **consolidate mental strategies for addition and subtraction** by establishing doubling, making to 100, whole and place value strategies, count on from larger.

Materials/resources required

- One die and a record sheet per person

How to implement

- Each player takes a turn to roll the dice
- Place the number rolled in either the 10's or the ones column of the record sheet (for example 3 can either be 3 or 30).
- After 6 throws the numbers are totaled and the player closest to (but below) 100 wins.
- If you get over 100 you bust.
- Play the game until you have filled the six roll grids.
- Record who wins each game.
- Then play the game again and this time roll the dice 7 times and fill in the 7 roll grids.
- Record who wins.



TEN-FRAME RACE

Learning focus

To consolidate **mental strategies for addition and subtraction** by establishing make to 10 and adding by place value parts.

Materials

- 10 sided dice
- Ten-frame game sheet
- Counters

Instructions

1. Each player must have a 10 by ten-frame sheet.
2. Each player takes turns in rolling a 10 sided dice. They place that number of counters on the first ten-frame. e.g. Player 1 rolls a 6, so they place 6 counters on the first board.

○	○	○		
○	○	○		

3. In your maths book you need to write what your running total is.
e.g. I have 6 ones.
4. Once every player has made their first roll, then every time they roll the dice they must first write in their books what they need to roll to fill their current ten-frame.
e. g. I need to roll a 4 to get to 10.
5. Players continue rolling the dice in turn and placing the counters on their ten-frames sheet, each time saying what they need to roll to get to fill the current ten-frame up completely and then what their running total is. e.g. Player rolls a 7 next time.

○	○	○	○	○
○	○	○	○	○

○				
○				

I now have 1 ten and 2 ones, 12.

I need to roll an 8 to get to 10.

6. The game is over when one player has filled all of the ten-frames on their sheet.

TRADING GAME

Learning focus

To consolidate 2 digit place value by working flexibly with ones and tens through making, naming and recording in place value parts.

Materials/resources required

- Match sticks
- A3 Place Value Chart – per player
- Dice – 6 sided

How to implement

1. Play the game in pairs. Each player must have a place value chart.
2. Player 1 rolls the die, then places that number of matchsticks on the chart.
3. Player 2 rolls the die, then places that number of matchsticks on the chart.
4. Repeat the process taking turns. When the number of matchsticks in the chart exceed the place value – the player must trade and move the appropriate number of matchsticks to the next column. E.g. if you 8 matchsticks in the ones column, and you roll a 5, then you must take the 8 + 2 (from the 5) and place the 10 in the tens column, with the remaining 3 in the ones column.
5. Record your running total as you have your go. Write your running total in place value.
e.g. $5 + 3 = 8$ (8 ones)
 $8 + 7 = 15$ (1 ten 5 ones)
 $15 + 6 = 21$ (2 tens 1 ones)
 $21 + 5 = 26$ (2 tens 5 ones)
6. The winner is the first person to get EXACTLY, 183.

Extension

Use a 10 sided dice

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

NUMBER JIGSAWS 1

Copy onto coloured paper and laminate. Cut along bold lines to form a jigsaw puzzle for students to complete.

CHICKEN SCRAMBLE

Goal

To introduce reliable strategies for counting large collections through counting in multiples and arranging groups into lines or arrays and skip counting.

Steps

1. Upturn the container of counters on the floor in an open area.
2. Each participant will act as a chicken and collect as much grain (as many of the counters) as possible without making contact to other chickens. Each chicken must keep count of their pile of grain as they are collecting.
3. Each chicken must write down how many pieces of grain they counted.
4. Check each chickens answer by counting again individually. Write down and explain your counting strategy to the teacher.
5. After sharing different strategies as a group make a list of efficient ways to count a large collection.
6. If you divide your grain (counters) into stacks of five, how many stacks do you have and how many remainder? Write this down in your book.
7. If you divide your grain (counters) into stacks of ten, how many stacks do you have and how many remainder? Write down in your book.
8. Can you think of any numbers that you could use to divide your grain into even groups? If so, what number and how many groups would it produce?
9. Demonstrate this using a diagram in your book.



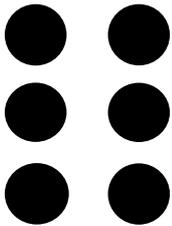
ARRAY PLAY

Goal

To introduce **arrays** through making and naming arrays to solve simple multiplication or sharing problems.

Steps

1. An array is a rectangle that is made up of rows and columns that can be used to demonstrate a multiplication problem. For example,



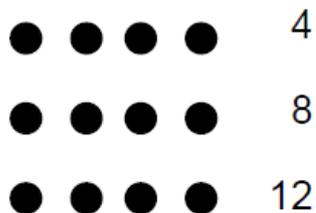
This is a representation of 3 twos, which makes 6. There are 3 rows and two columns. How else can I arrange these counters to represent 6?

With a partner, show the different ways you can make arrays for the number '12'?

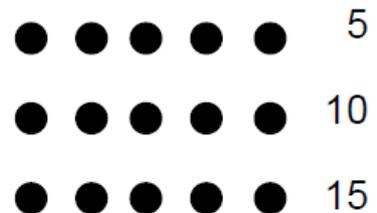
2. When you have completed this question, shade them on your grid paper. What do you notice about the rows and columns? Could these be given another name?
3. Look at the following arrays below. Explain what each array represents.



“4 twos, 8!”



“3 fours, 12!”



“3 fives, 15!”

4. Now using your grid paper. Choose five numbers and make as many arrays as you can for each number. Shade these on your grid paper. Use the counters to help you.

DICE DOUBLE

Learning goal

To consolidate mental strategies for addition and subtraction by establishing doubles, part-part-whole knowledge, make to 10 and place value based strategies.

Steps

- Form a pair. Collect a **6-sided die** and a highlighter each.
- Decide who starts. Roll the die and **double the number** rolled.
- Colour that number of squares on the 10 by 10 grid below.
- At the end of each turn write the total of the squares coloured **so far** in the last square.
- Next person rolls, doubles the number, colours that number of squares on their grid and writes the **total so far** in the last square coloured.
- Repeat this for each roll of the die. First to fill their grid wins.

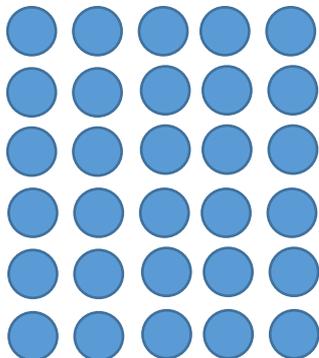
- Repeat the game using a 10-sided die.
- Swap partners if possible.

HURRAY FOR ARRAYS

Goal

To make and name arrays, using efficient strategies to work out totals.

For example:



3×5

3 fives

I see....

$2 \text{ fives} = 10$

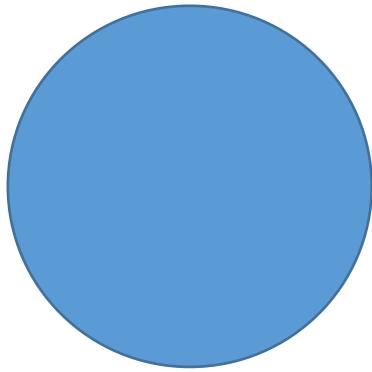
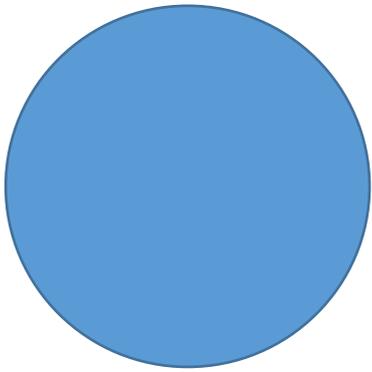
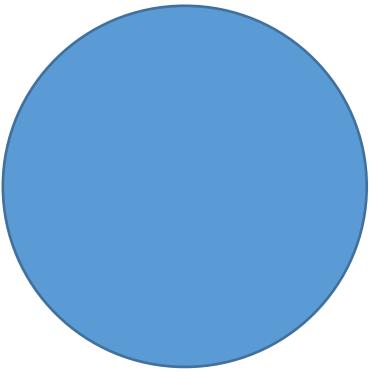
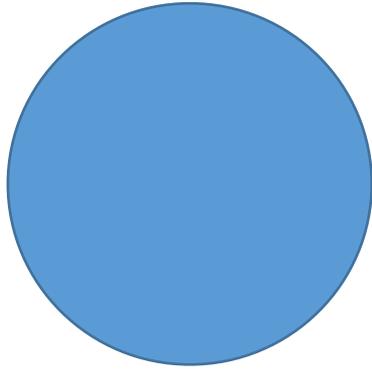
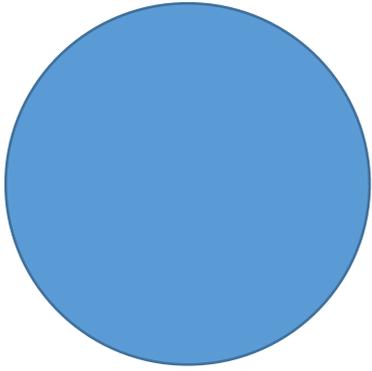
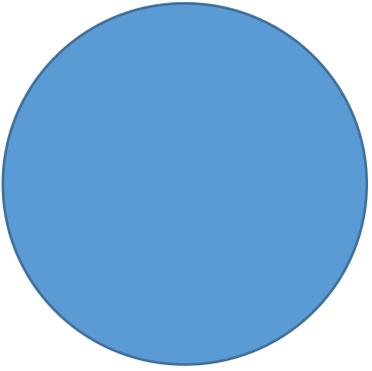
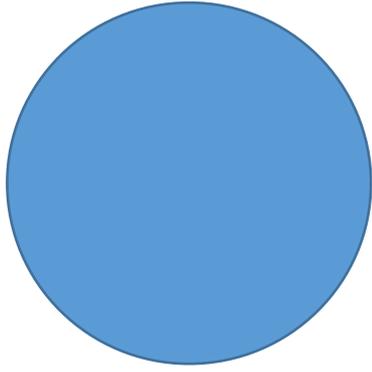
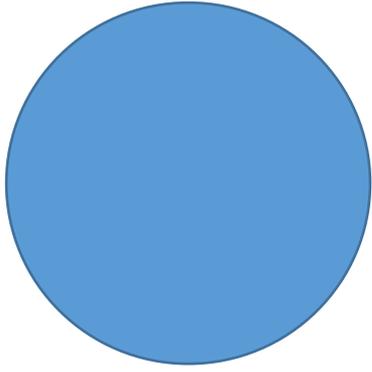
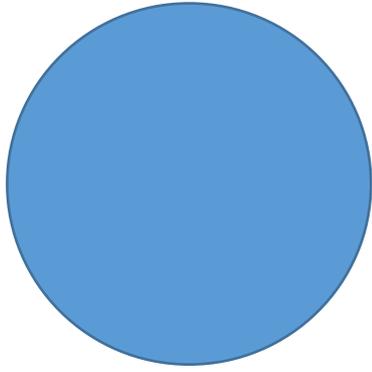
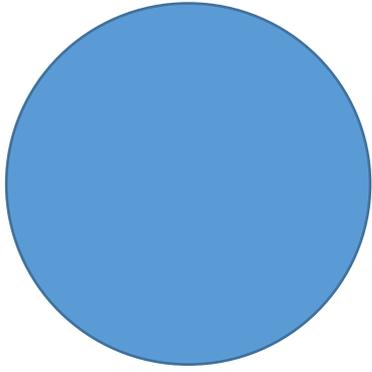
and

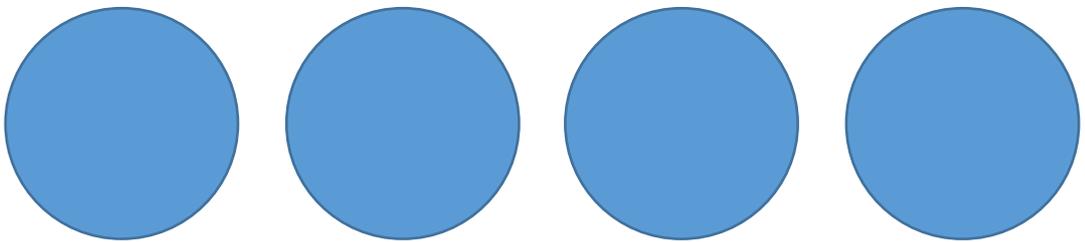
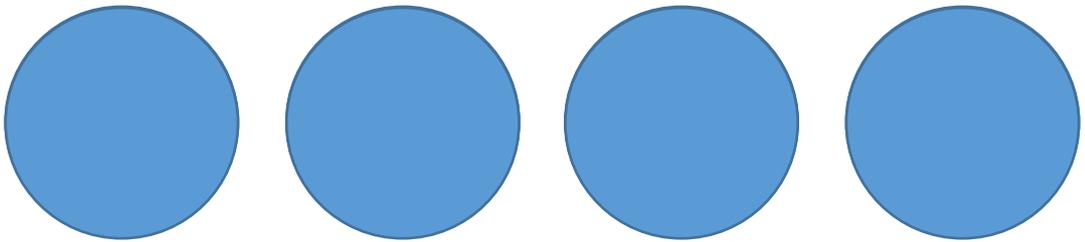
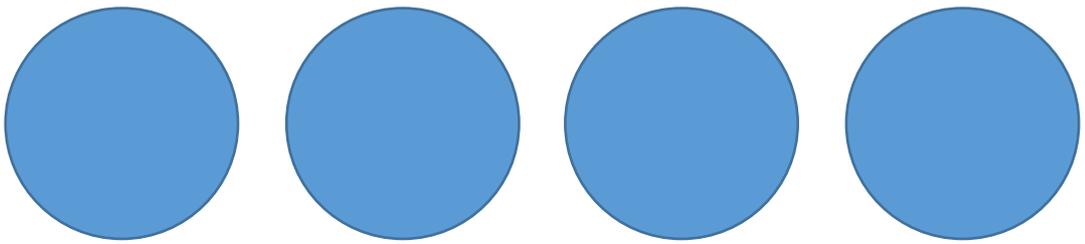
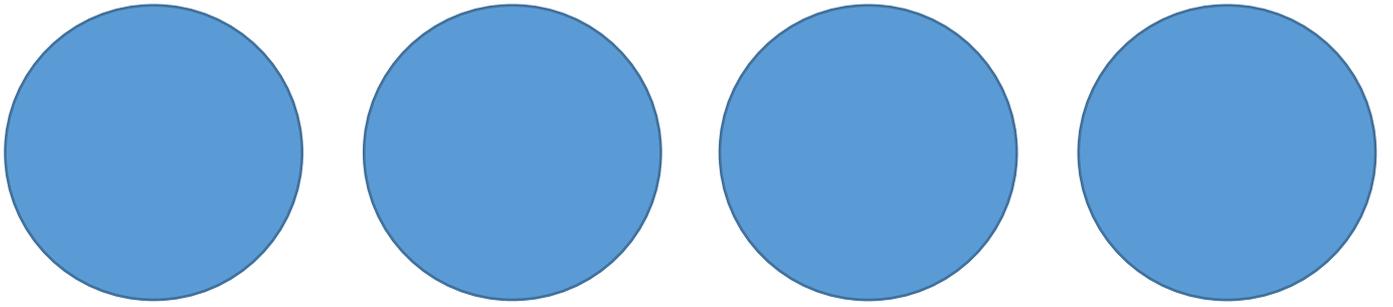
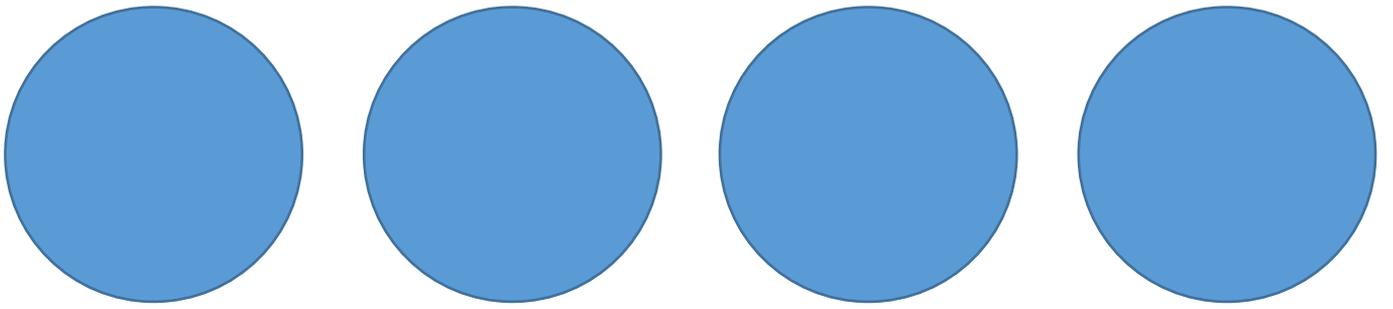
$1 \text{ five} = 5$

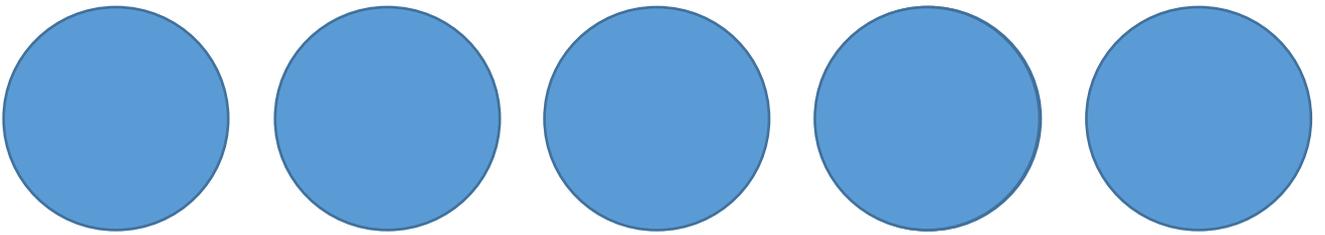
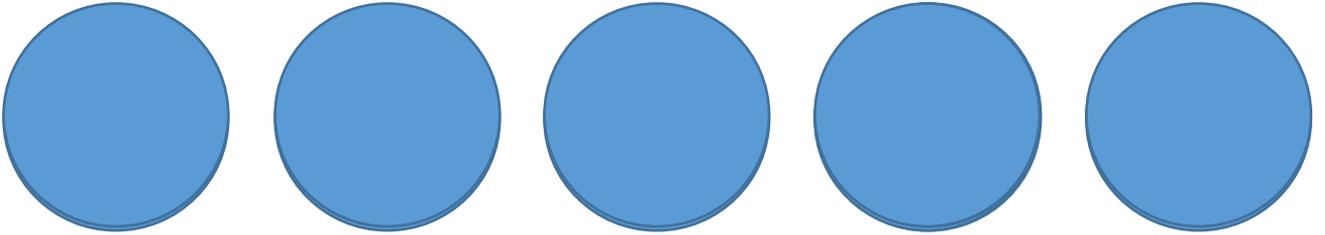
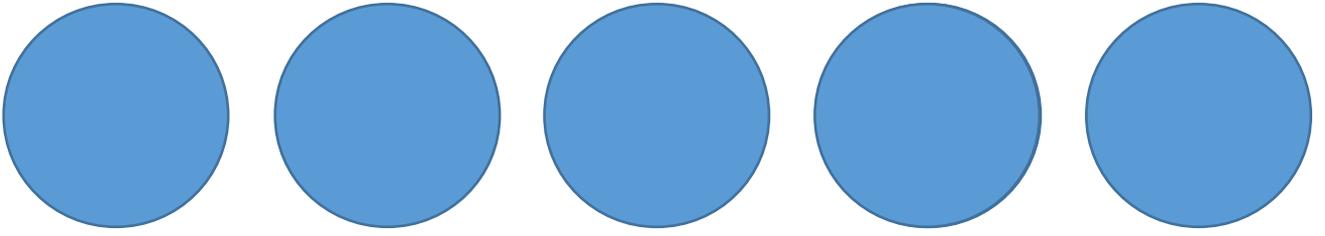
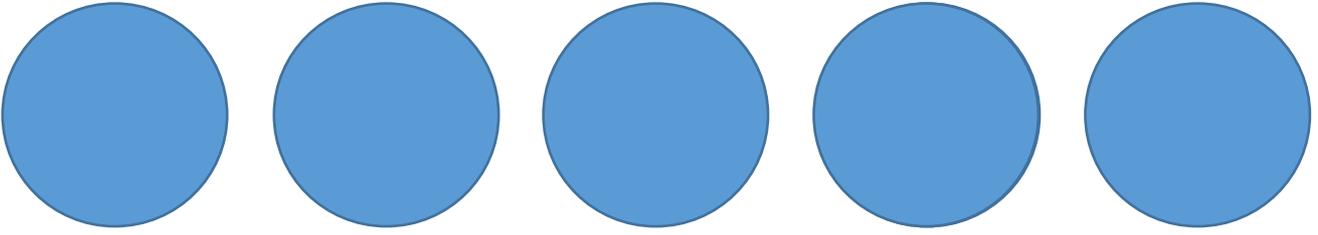
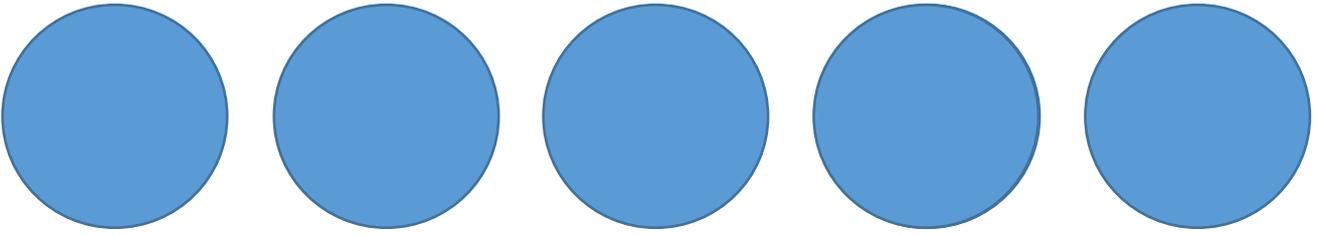
$\text{So } 3 \text{ fives} = 10 + 5 = 15$

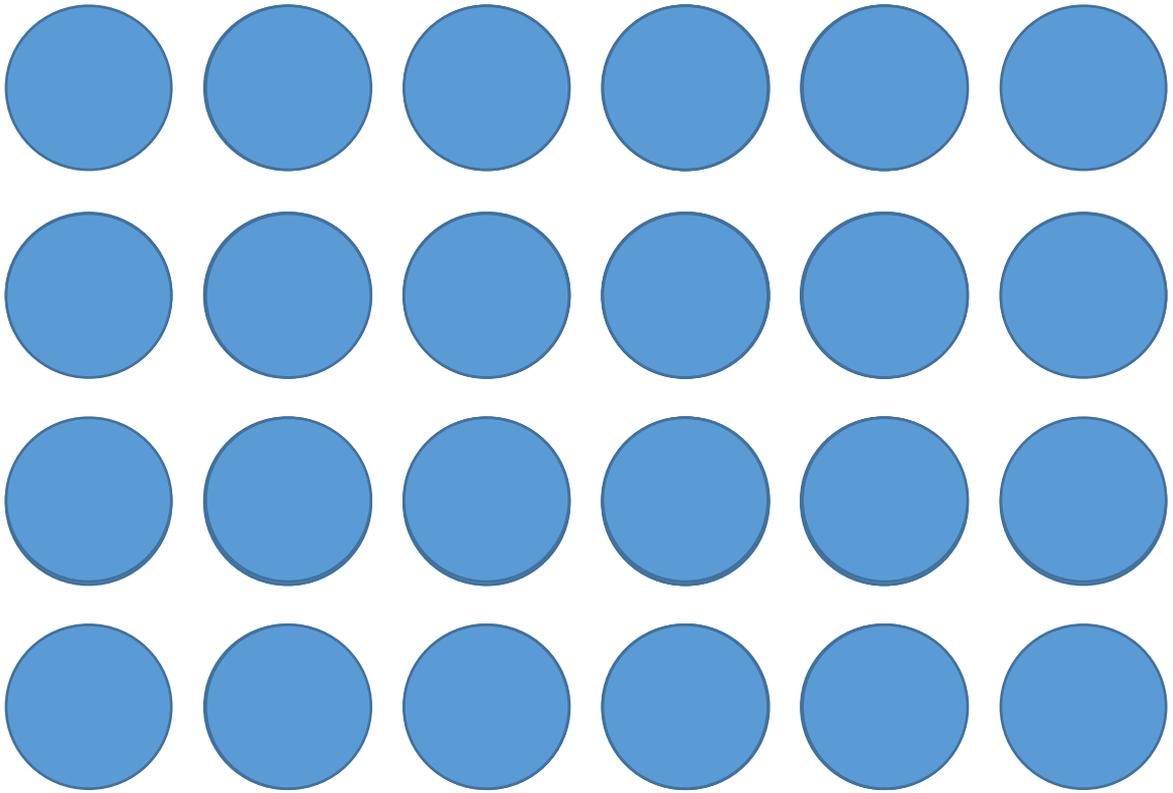
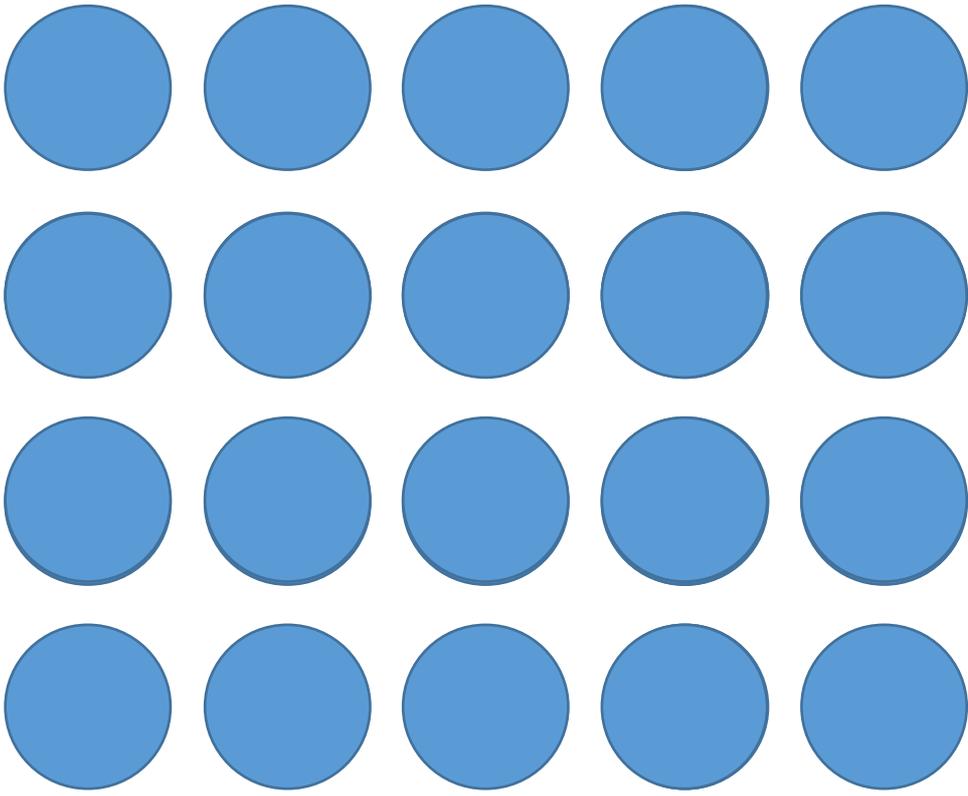
Steps

1. Teacher briefly flashes an array card to students. Students make the array they have seen and report back in terms of rows and columns and total, "3 fives, 15."
2. Repeat for other array cards.
3. Teacher briefly shows an array card to students and asks, "How many would be there if there were (insert number) more rows?" e.g. "3 fives, 15, 2 more fives, 10, so 25."
4. Repeat for other array cards.
5. Teacher displays an array card that is partially covered and students make and name the completed array (using counters) and draw in books.









0	1			4	5		7		9
10	11	12	13	14	15				
	21	22	23		25		27	28	29
30			33		35	36	37	38	39
	41	42		44		46			49
50		52		54		56	57		
			63	64	65	66	67		69
70	71	72	73		75			78	
80		82		84			87	88	89
90	91		93			96		98	

NUMBER JIGSAWS 2

Copy onto coloured paper and laminate. Cut along bold lines to form a jigsaw puzzle for students to complete.

Hint: Use different coloured paper for the different Number Jigsaws so they are easy to identify.

0			3	4	5		7		9
10					15			18	
20	21	22	23	24					
			33		35		37	38	
		42		44			47		
	51								59
60				64			67		
			73						
	81					86	87		
	91			94	95				99

NUMBER JIGSAWS 3

Copy onto coloured paper and laminate. Cut along bold lines to form a jigsaw puzzle for students to complete.

			3				7		9
					15				
20	21								
			33		35			38	
		42					47		
	51								59
				64					
			73						
	81						87		
	91				95				99

NUMBER JIGSAWS 4

Copy onto coloured paper and laminate. Cut along bold lines to form a jigsaw puzzle for students to complete.

Square Fill-in

1									10
				15					
			24					29	
						37			
	42								
					56				
	62							68	
			74						80
81						87			
				95					100
		103							
								119	

Fill in **only** these numbers:

41	94	50	19	45	77
27	79	96	6	92	61
65	33	12	58	63	99
106	117				

Square Fill-in

0									
					15				
				24					29
							37		
		42							
						56			
		62						68	
				74					
	81						87		
					95				
			103						
									119

Fill in only these numbers:

43	96	52	21	47	79
30	83	98	8	94	63
67	35	11	60	65	101
108	116				