TREASURE HUNT: BIRTHDAYS

FIND A PERSON WHO IS YOUR AGE AND WRITE HIS BIRTHDAY	
ADD YOUR AGE DIGITS. FIND SOMEONE NOT YOUR AGE WITH THE SAME TOTAL.	
LARGEST AGE DIFFERENCE TO YOURS.	
SMALLEST AGE DIFFERENCE TO YOURS	
BIRTHDAY WHICH IS AROUND 100 DAYS BEFORE OR AFTER YOUR BIRTHDAY	
THE SUM OF YOUR AGES MAKE AN EVEN NUMBER	
PUT 5 BIRTHDAYS IN ORDER STARTING FROM THE YOUNGEST	
CREATE A GROWING PATTERN WHICH ENDS WITH YOUR AGE NUMBER	

NUMBER SENSE

Maths Support Team

Inset Year 1
July 2018

What is Number Sense?

"a well organised conceptual framework of number information that enables a person to understand numbers and number relationships and to solve mathematical problems that are not bound by traditional algorithms" (Bobis, 1996).

Learning Outcome:

A.1.1 **count** reliably forward and backwards up to 10 everyday objects.

A.1.2 understand the **value of each number**.

A.1.3 **recognise** and **write** numerals 1 to 9, then 0 and 10, then beyond 10.

A.1.4 **compare** and **order** numbers including ordinal numbers.

A.1.5 **talk about**, recognise and **recreate simple patterns** e.g. counting in 2's and 10's.

Underpinning Learning Outcomes:

1) I can ***use numbers***, shapes, measurement and print to communicate my thoughts and ideas
2) I ***can demonstrate understanding of number value***
3) I can apply the mathematical concepts which I have mastered to solve real-life and mathematical problems

Lesson Objective: Developing Number Sense

1)Number Knowledge

2)Counting skills and Principles

3)Nonverbal Calculation

4)Number Calculation

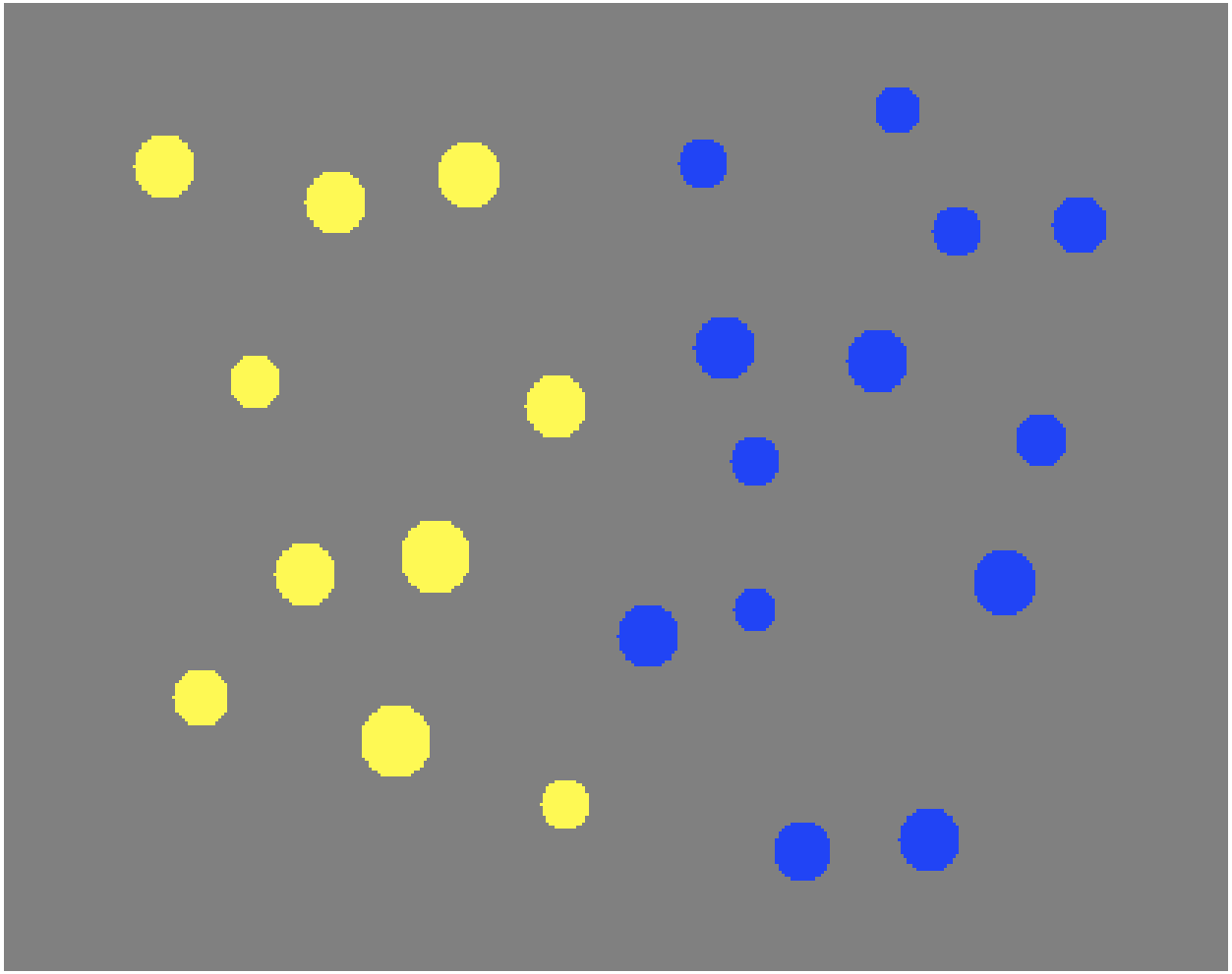
5)Story Problems

What teaching strategies opportunities promote early number sense? (Tsao and Lin 2012)

1. Work with concrete materials and familiar ideas
2. Compose and recompose different representations of number
3. Discuss and share their discoveries and solutions
4. Investigate the realistic uses of number in their everyday world
5. Explore number patterns and relationships
6. Create alternative methods of calculation and estimation
7. Solve realistic problems using a variety of approaches
8. Calculate for a purpose rather than just for the sake of calculating
9. Gather, organise, display and interpret quantitative data
10. Measure and estimate measure for a purpose
11. Explore numbers and their representations using number lines

Tasks requiring estimation (Van Den Heuvel-Panhuizen 2003) <u>as distinct</u> from precise computation position learners to translate between alternative quantitative representations, thereby increasing the sophistication and efficiency of their own number knowledge (Siegler and Booth 2004).

Which colour has more dots?



The correct answer is:

BLUE

Subitising or 'Numerosity Perception' is important as it is something that comes up in the everyday life of the students. Researchers argue that it can precede and support the development of counting (Sarama & Clements, 2009).

The Relationship of More, Less and the Same

- **Concrete and familiar ideas**

Six pirates come on the ship.
Captain Flash gives each pirate a bag of beans.

Open your envelopes, who has more?
How many do you think you have?

Organize your beans and tell your friend.

Number Knowledge

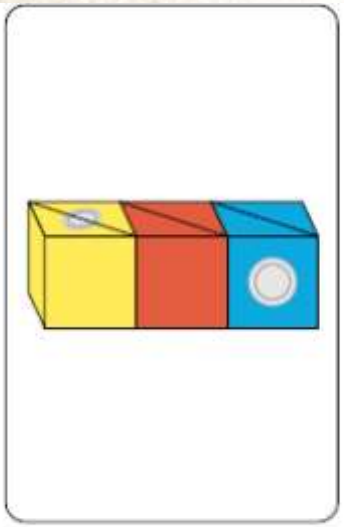
Previous Knowledge:

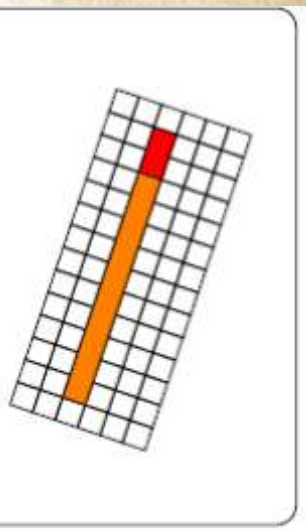
- Pointing routine for tagging objects while counting.
- Number names
- Number words

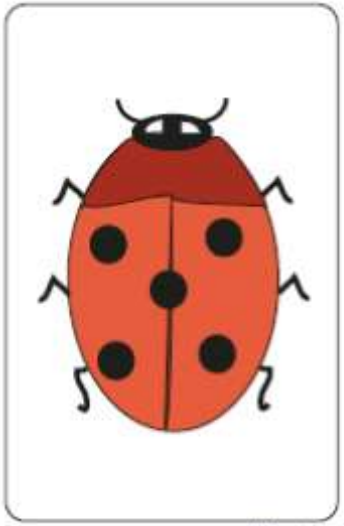
Number Knowledge

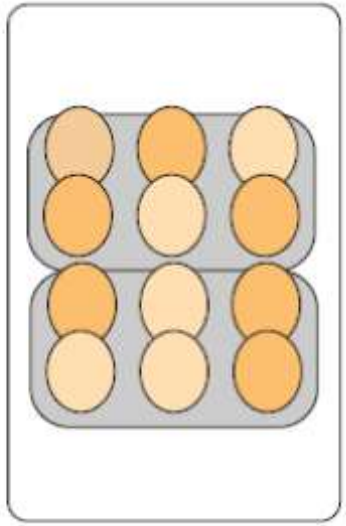
- An understanding of quantity involving zero.
- The relationships between quantities and numerical complexity.
- Construct relationships between quantities.
- A grasp of the part-whole relationships.
- Construction of the mental number line to understanding activities involving numbers.
- Understanding magnitude comparison.
- Patterning numbers.
- Find missing numbers in sequences.

Number Knowledge – 5

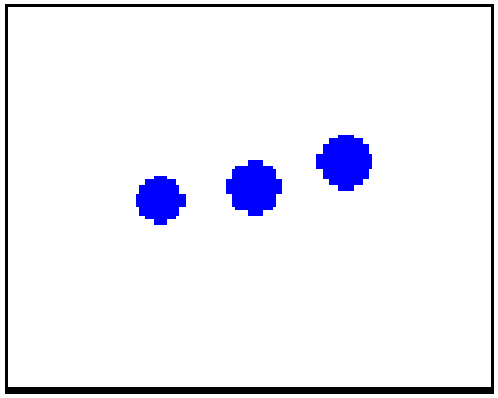


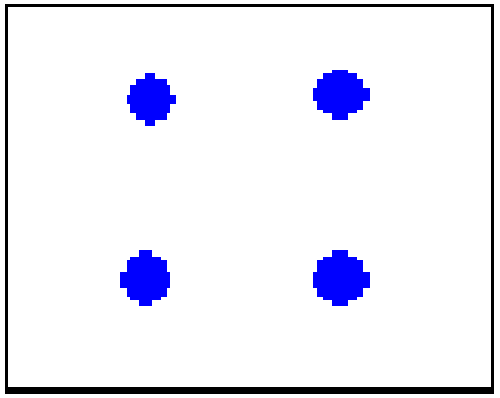


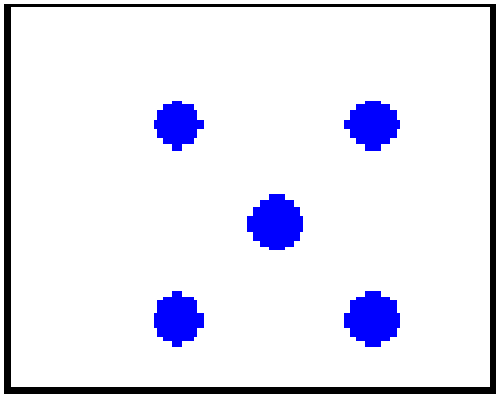


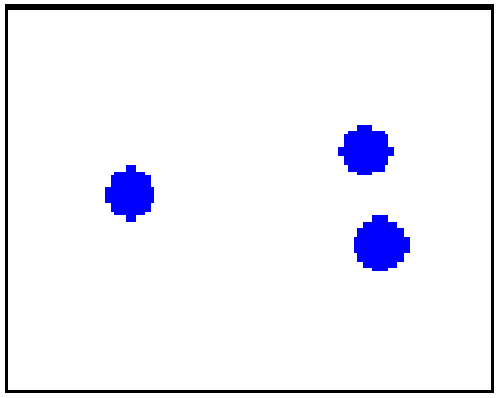


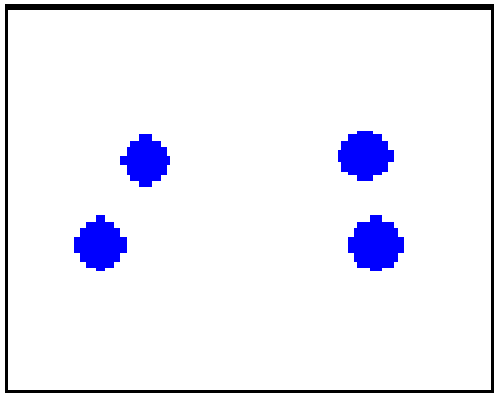
Number Knowledge – 5

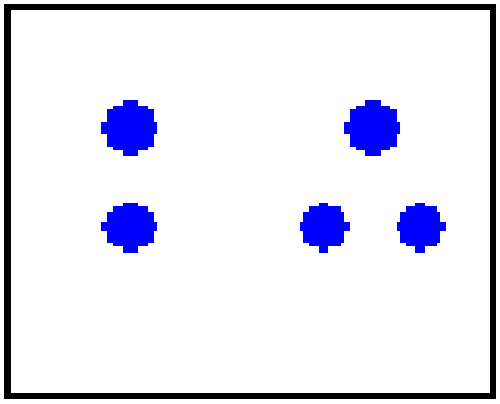




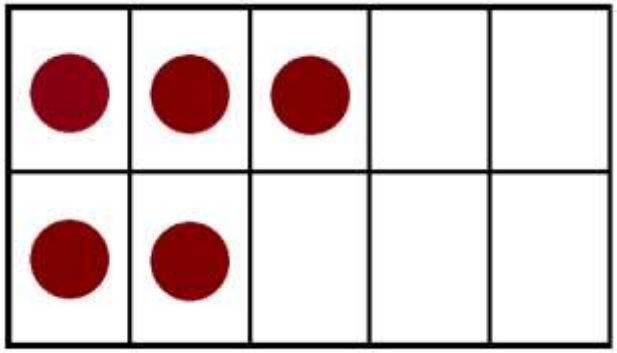




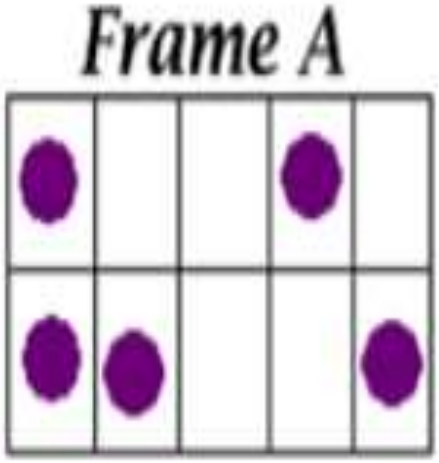


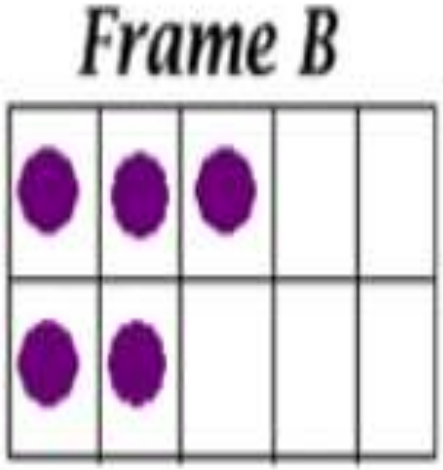


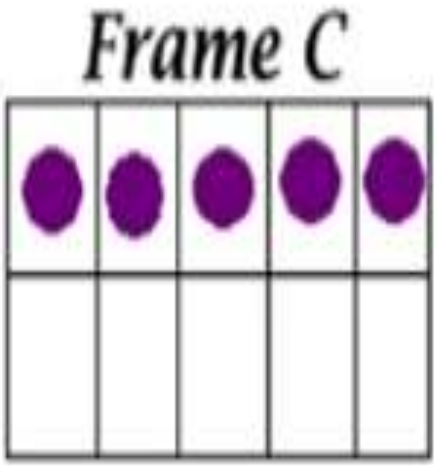
Number Knowledge – 5



Various arrangements of counters on the ten-frames can be used to prompt different mental images of numbers and different mental strategies for manipulating these numbers, all in association with the numbers' relationships to ten.





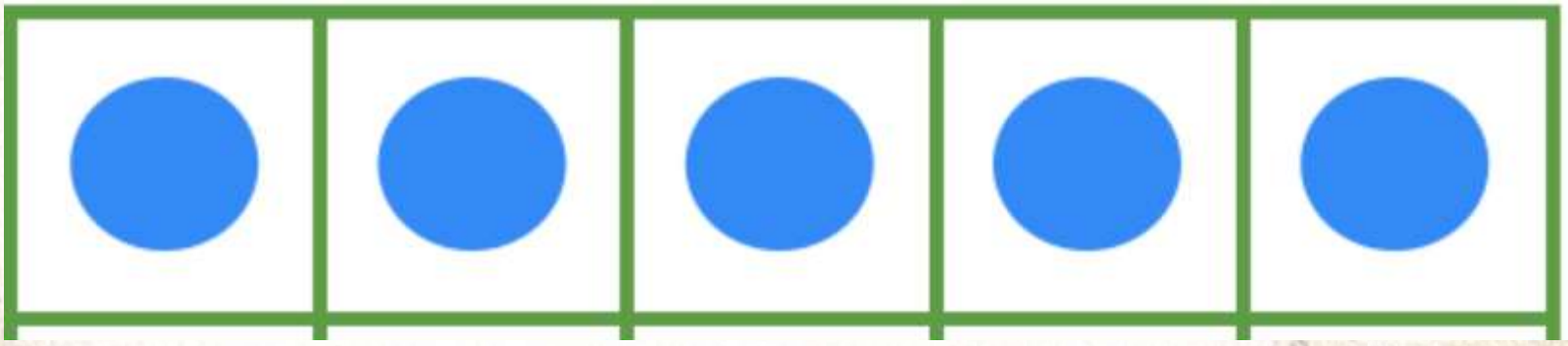


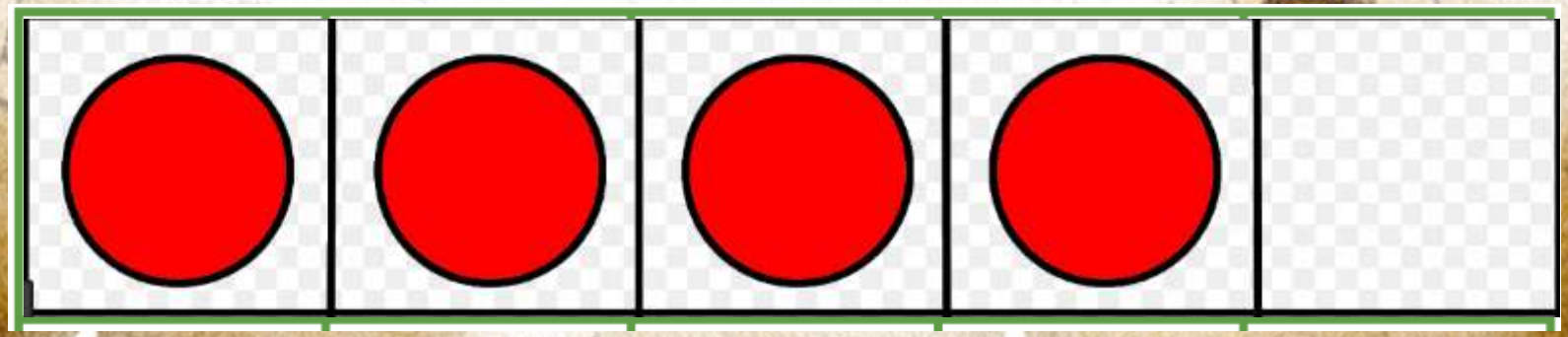
Number Knowledge – 5

- Make 4 different number lines starting with 5.
- Put 5 hearts, 5 clubs, 5 diamonds and 5 spades on 4 different tables.
- Give the rest of the cards to the children.
- Children are asked to find their team according to their cards and complete the number line.

Number Knowledge – 5

Comparing quantities





Number Knowledge

- Playing numerical board games improves understanding of numerical magnitudes, counting, number recognition (Siegler 2010) which are needed for reasoning quantitatively

Counting Skills and Principles

- Knowledge of the count sequence.
- Enumeration of sets, number recognition, and understanding of counting principles.
- Counting the combination of two collections starting from one.
- Use 'counting-on' strategies spontaneously.
- Identifying miscounts

Counting Skills and Principles

Cardinality develops through six stages:

1. No understanding of cardinality. Random response to 'how many?'

2. Partial count-cardinal reference. Offers a number string but without pointing or making reference to the items of the set.

3. Full count-cardinal reference. Makes reference to the objects and points with finger to each object while counting. If asked again, they point once more to each of the objects, counting again, but without giving a single number word.

5. A partial cardinal response. Gives the largest number but if the standard order of the sequence is changed, they still pronounce the largest number as the cardinal value.

6. A true cardinality answer. Children answer the cardinality question with the number word that correctly refers to the number of items in the set.

Counting Skills and Principles

- How many dominoes are there with a total number of 5 dots?

  Organize the dominoes in a pattern.

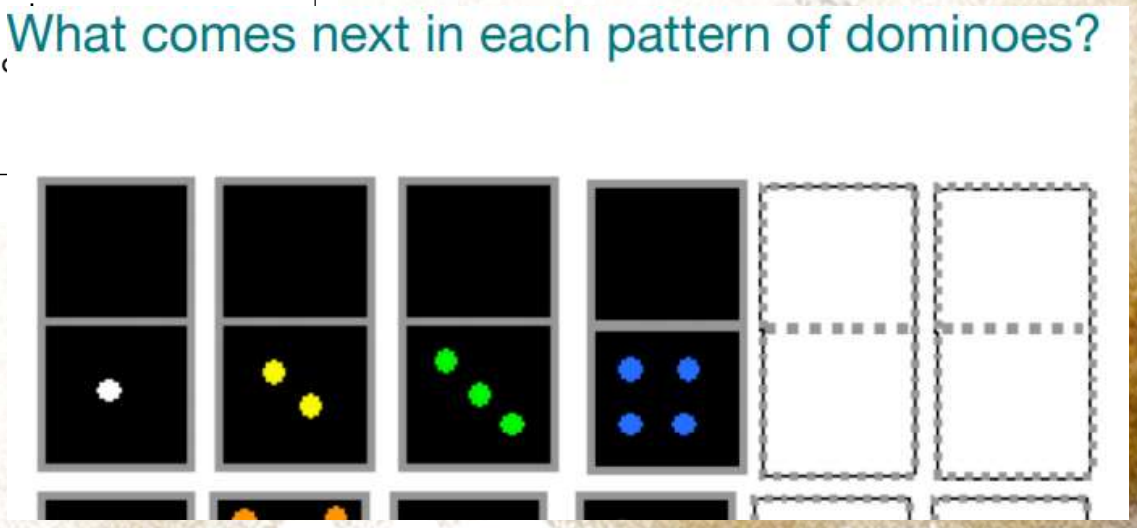
  Discuss.

Counting Skills and Principles

- Find all the dominoes with 5 dots on a side.
- Organize them in a pattern.
- Can you count the total of dots. Think, pair and share.
- Use a ten frame and copy each tile on a ten frame.

Counting Skills and Principles

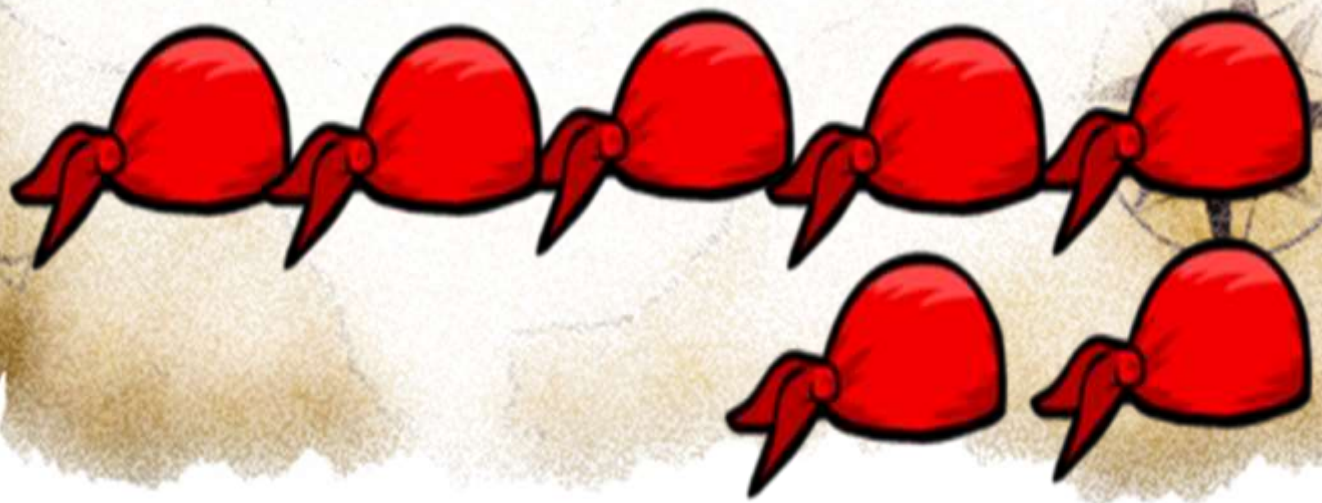
One side is one more than the other side.	One side is one less than the other side.
Total number of spot is less than ..... (Choose any number)	Total number of spots is more (Choo



Counting Skills and Principles

Pirate Jack says 5 and 2 is 8.
Is he correct?

Discuss



Nonverbal Calculations

How many left?

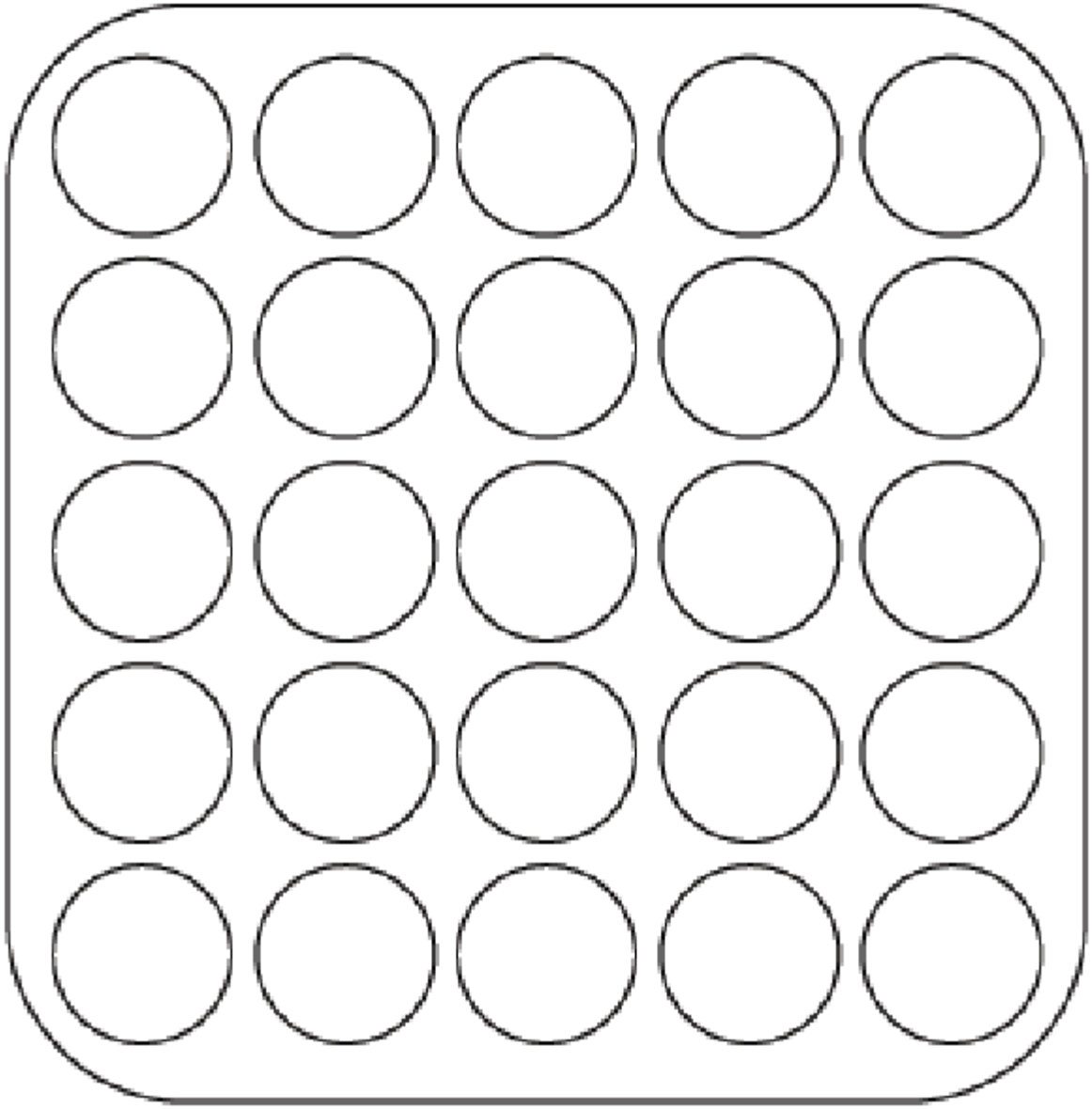
Nonverbal Calculations

- Abilities in addition and subtraction based on their experiences of combining and separating sets of objects in the real world.
- It marks some understanding of 'counting-on' and 'counting-back' and an appreciation of counting as an abstract activity.

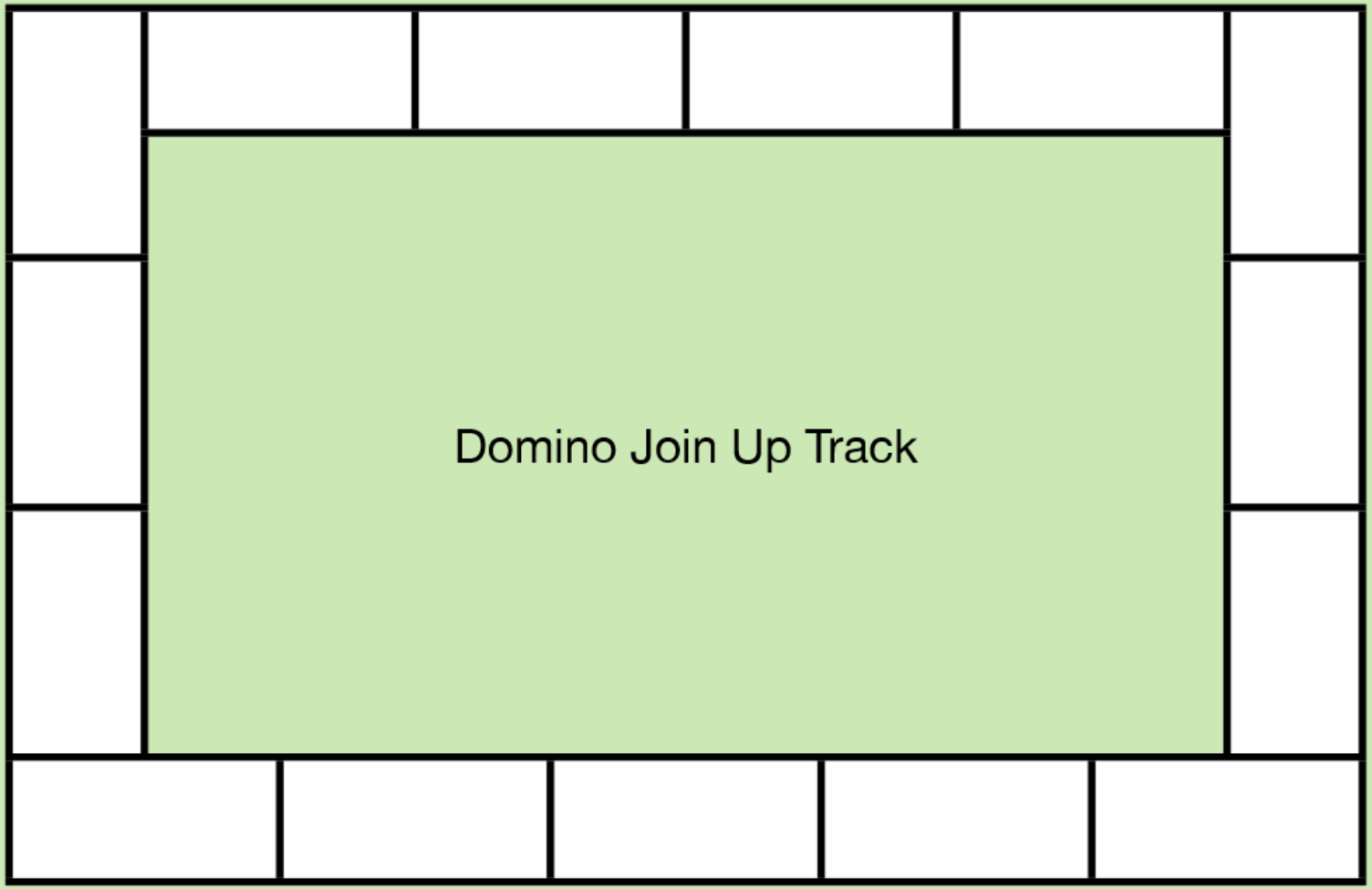
Nonverbal Combinations

Into how many ways can you divide 5?

How do you know that you found them all?



Number Knowledge – 5



Story Problems

- The transfer of what has been learned to a new situation
  - Modelling may begin with manipulatives or pictorial referents to represent quantities

The pirates are thirsty and need to drink water. There are 10 pirates but 2 of them already have a bottle of water. How many bottles of water are needed?

Story Problems

The 9 Problem Solving Strategies

1 Look for the important words in the question

Write them down.

Underline them.

Make sure I know what to do.

2 Look for a pattern

Can I see something happening over and over again?

Will this help me solve the problem?

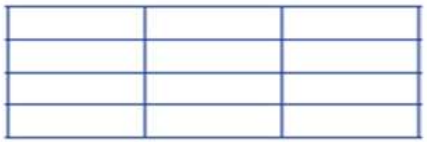
3 Have a go

Try an answer.

Does the answer make sense?

4 Use a table or a chart

Will something like this help?



5 Use a drawing

Can I draw something about the problem?

Will this help me to find the answer?

6 Work backwards

Can I start at the end of the question to help work it out?

Will my answer work?

7 Try an easier problem

Can I change the numbers in the question to make it simpler?

Will this make finding the answer easier?

8 Make a model

Can I use paper or blocks to help me find the answer?

Can I use people to help me find the answer?

9 Think logically

Can I tell something about the answer straight away?

Can I get rid of answers that are not correct?

Macmillan Maths Problem Solving Box 2 © Peter Maher/Macmillan Education Australia. ISBN 978 1 4202 9394 4

Story Problems

- Use the toolbox to model the story.

Captain Flash has 5 coins in one pocket.
He finds 2 more coins in the other pocket.

How many coins does he have?

Make a model, pair and share.

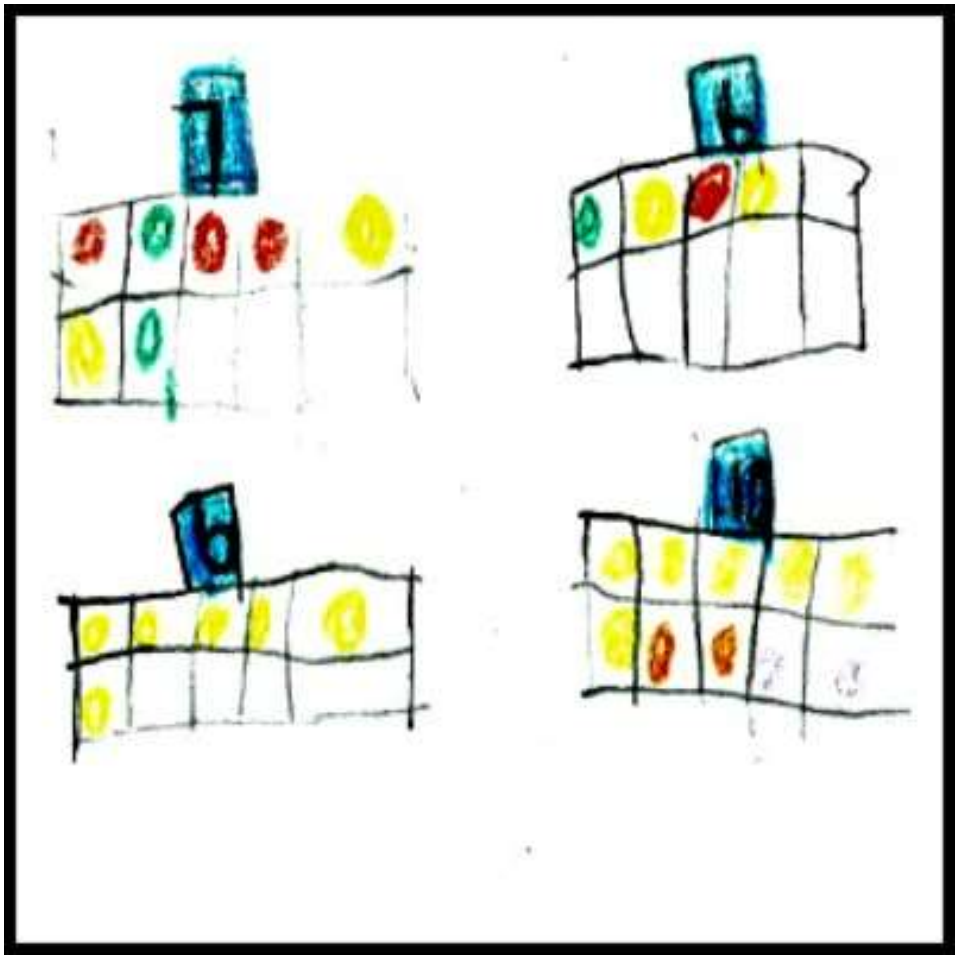
Journal

Captain Flash has 7 coins altogether.
He shares his coins with Pirate X.

Draw your answers.

Example of a JOURNAL

JOURNAL ENTRY: Make your own number on the Ten Frames!



THANK YOU!