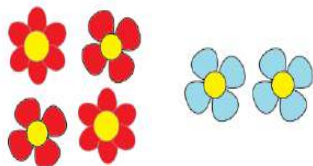


Reasoning and Problem Solving

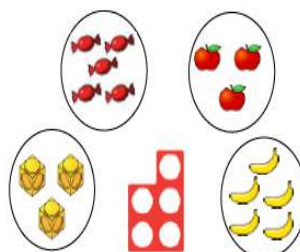
How have the objects been sorted?



They have been sorted into colours.

They could have been sorted into 4 petal flowers and 5 petal flowers.

How can the objects be sorted?



They can be sorted into:

Red and yellow
Fruit and non-fruit
5 and 3

Reasoning and Problem Solving

I am going to count on from 8

Will I say the number 6?

Explain your answer.

No, you will say 9 and 10. If you were counting backwards you would say the number 6

How many ways can you represent 6 glasses of apple juice?

How many ways can you show me less than 4 sweets?

How can you show me that there are more green cars than blue cars?

Children could line up 6 counters, cubes
Children could line up 3, 2, 1 or get zero counters
Children could get 1 blue cube and 2 green cubes etc.

Reasoning and Problem Solving

Spot the mistake and explain what has been done wrong.

5, 6, 8, 9, 10

7, 6, 4, 3, 2

7, 6, 3, 2, 1

The number 7 is missing

The number 5 is missing

The numbers: 5 and 4 are missing

Katy is counting.




Is she counting forwards or backwards?

How do you know?

She is counting backwards because the numbers are getting smaller.

How have the sequences been sorted?

0, 1, 2, 3, 4	3, 2, 1, 0
	Seven, six, five, four

Children to write the correct labels on the table. Counting forwards on the left and counting backwards on the right.

Counting forwards, I could add: 3,4,5,6,7
Counting backwards I could add 9,8,7,6,5

How many more sequences can you add to each column?

Reasoning and Problem Solving

Using number cards 0 to 10.
How many different ways can you complete the boxes below?



Look to see if the children are working systematically e.g. 1 and 0, then 2 and 1 etc

Timmy rolls the number that is 1 more than the dice below.



He says that he rolls 2

Explain his mistake.

Timmy has said 1 less than 3 instead of 1 more than 3

Dan says:



How old is Dan?
Who is oldest?

Explain why.

His sister is 8 because she is one more than 7 so he is 9 because he is one more than 8 Dan is the oldest because 9 comes after 7 and 8

Reasoning and Problem Solving

There are 4 children going to the beach.
Can every child have a bucket and spade?



If not, why not?

No. There are enough spades for one each but not enough buckets.



Can the family all travel in a 6 seater car?
Explain how you know.

Yes. There are 6 seats and only 5 people.

Which group of dogs match the leads?
Explain why.

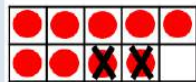
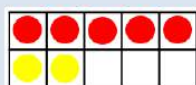
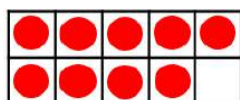
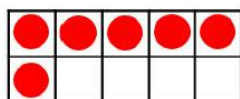
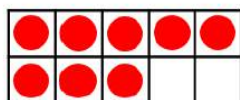
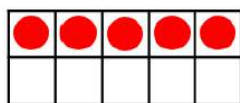


There are 5 leads so the box with 5 dogs in matches the leads.



Reasoning and Problem Solving

Move three counters so all the ten frames show the same amount.



Create your own problem like this.

Miriam has this many cubes in one hand:



She has fewer cubes in the other hand.

How many cubes could she have in her other hand?

She could have:

- 4 cubes
- 3 cubes
- 2 cubes
- 1 cube

Reasoning and Problem Solving

Circle all the numbers from the number track that **cannot** go in the box. Why?

$$6 < \square$$



6, 5, 4, 3, 2, 1 because $6 <$ means '6 is less than' so the other number needs to be greater than 6.

Children can include 0 even though it is not on the number track

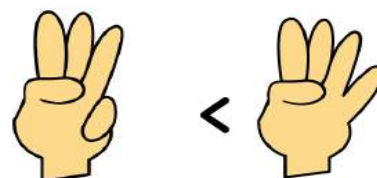
Draw images to go in both boxes to make the statement true.

$$\square > 6 > \square$$

Children to draw image of 7 or above in left box and image of 5 or below in right box.

Follow the instructions to play the game:

1. Both children make a fist.
2. On 3, show some fingers.
3. Choose a sign $<$, $>$ or $=$ to make the statement correct.



This game can be played to develop fluency. To extend:

- Can we move places to change the sign?
 - How can we change fingers to use the $=$ sign?
- Can we use two hands each?

Reasoning and Problem Solving

One of these statements is incorrect.
Use cubes to prove which one.

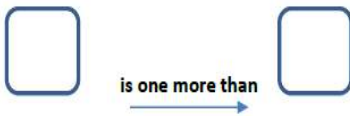
$$8 > 4$$

$$7 < 10$$

$$3 > 6$$

Children prove that $3 > 6$ is incorrect using cubes or by drawing diagrams.

Using number cards 0-10.
How many ways can you complete the following?



Some examples:

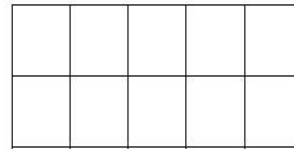
9 is 1 more than 8
6 is 1 more than 5

Encourage children to be systematic in their approach.

True or False?

1 more than 7 is the same as 1 less than 9.

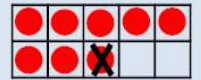
Use the ten frame to show me.



True



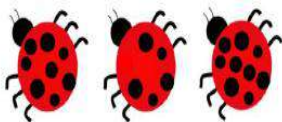
1 more than 7 is 8



1 less than 9 is 8

Reasoning and Problem Solving

Milly is ordering these three ladybirds from the greatest amount of spots to least.



She says:



I can just compare the first two to work out the answer.

No, she needs to know how many spots on the third ladybird to correctly place them.

Do you agree? Explain why.

Jarvis has 6 sunflowers.
Hano has more sunflowers than Jarvis.
Nia has more sunflowers than Hano.

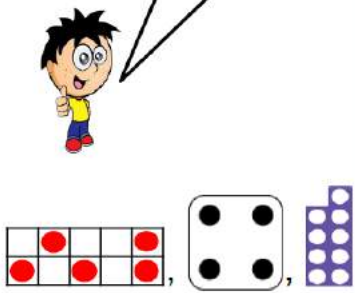
Who has the least amount of sunflowers?



Jarvis has the least amount of sunflowers with 6.

Joe says:

I have ordered the following from smallest to greatest.

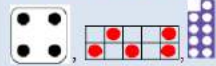


Do you agree with Joe?

Explain your reasoning.

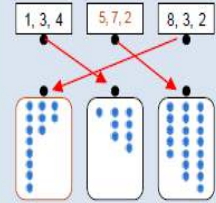
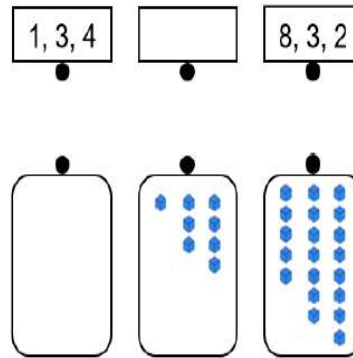
Joe is incorrect because he has 5 in his ten frame. This should be the middle number.

The order should be:



Reasoning and Problem Solving

Complete the image and match the numerals to the correct picture

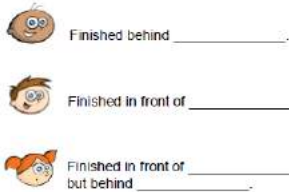


David, Louise and Freddie take part in a race.

The results are:



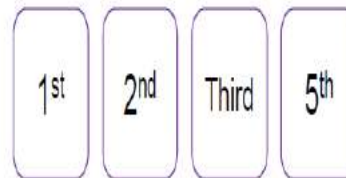
Fill in the blanks:



David finished behind Louise or Freddie.
Freddie finished in front of David or Louise.
Louise finished in front of David but behind Freddie.

Reasoning and Problem Solving

Spot and explain the mistake:



4th is missing.
Children should explain by saying things like 4th comes after 3rd and before 5th

Reasoning and Problem Solving

Roll a die.



Place a counter on the number line covering the digit shown by the die. Work out how many jumps to 0 and how many to 10.

Which is closer?

If you landed on 6 and did three jumps, what digits could you land on?

Can you land on a number where there are 7 and 3 jumps to 10 or 0. Which numbers could they be?

Open ended - land on 8.
2 jumps to 10, 8 jumps to 0

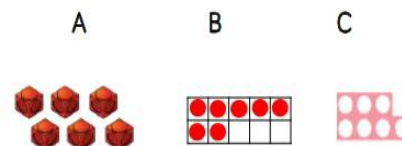
9 or 3

3 or 7

Jules points to a number on the number line.



Which of the following do not represent this number?



A does not represent the arrow on the number line as it shows 6.
B and C both show 7.

Count & Write Numbers to 20

Reasoning and Problem Solving

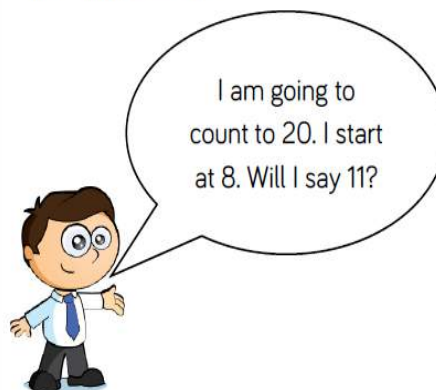
Circle the odd one out and explain why.

11, 12, 13, 14, 51, 16, 17

51 is incorrect.
The number
should be 15

The digits have
been swapped
round.

Mr. Monaghan says



Will Mr. Monaghan say 11?

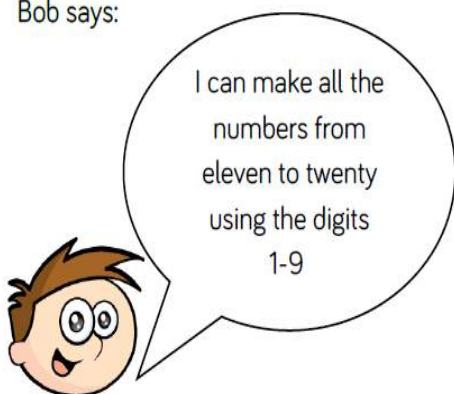
Explain how you know.

Yes, because 11 is
between 8 and
20

Numbers from 11 to 20

Reasoning and Problem Solving

Bob says:



Do you agree?

No, you cannot
make 20 because
you need a zero.

Which card is the odd one out?



Fourteen as it
doesn't have a
matching card.

Explain how you know.

Use 2 sets of number cards.

1 set with numerals 1-20

1 set with words 1-20

Play in groups of 3 or 4

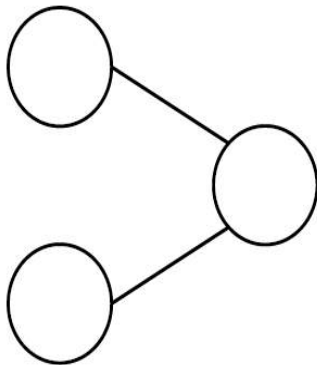
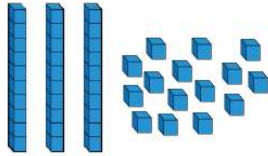
Take it in turns to pick a numeral card.

If they match you win the pair, if the
cards don't match put them back.

Tens and Ones

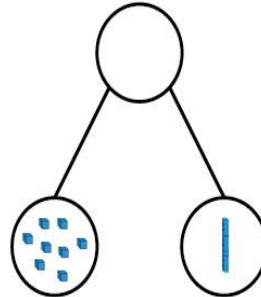
Reasoning and Problem Solving

How many ways can you complete the part whole model using the Base 10 equipment – you do not have to use it all.

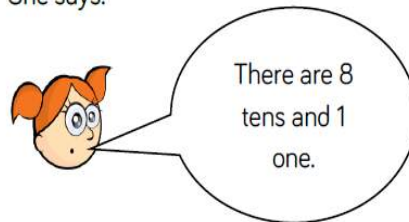


Open ended e.g. 1 ten and 5 ones make 15

Jodie makes a part whole model.



She says:



Explain her mistake.

What is her number?

Jodie has counted the ones as tens and the tens as ones.

She should say there is 1 ten and 8 ones.

Her number is 18

Count One More & One Less

Reasoning and Problem Solving

Dan says,

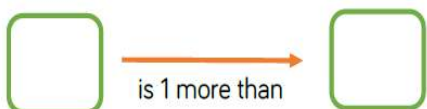


How old is Dan?
How old is his sister?

Dan is 15.
Dan's brother is 13. So Dan's sister must be 14 – as she is one year older than Dan's brother. Dan must be 15 as he is one year older than his sister.

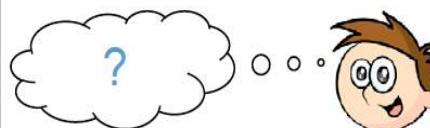
Use number cards 11-20.

How many different ways can you complete the boxes below?



Example answers:
18 is 1 more than 17
12 is 1 more than 11

Adam thinks of a number.

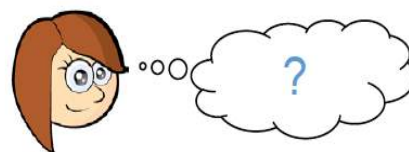


1 more than his number is 11

What is his number?

Adam's number: 10

Jan thinks of a number.



1 less than her number is 15

What is her number?

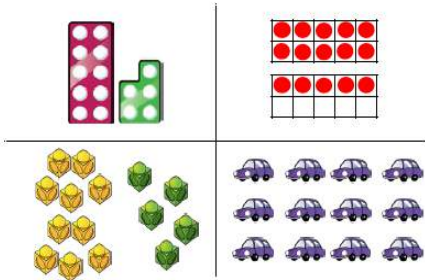
Jan's numbers: 16

Compare Groups of Objects

Reasoning and Problem Solving

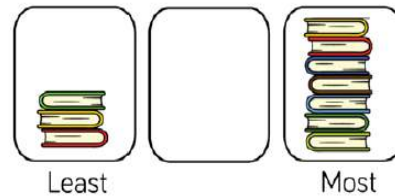
Which image is the odd one out?

Why?



The cars because there are 12 and the rest show 15

How many books can go in the empty box?



The middle box could have 4, 5 or 6

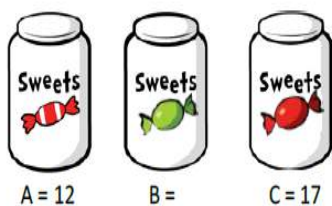
Compare with your partners- have you drawn the same amount of books?

How many possibilities are there?

Compare Numbers

Reasoning and Problem Solving

Sarah has three jars of sweets.

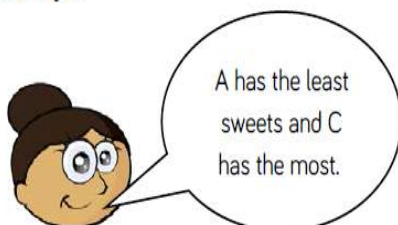


A = 12

B =

C = 17

She says:



How many sweets could be in B?

Possible answers:
13, 14, 15, 16

Discussion point with class:
can it be 12 or 17?

It cannot because it would have to be phrased 'A and B have the least/most'.

Fill the gaps:



is more than 15 but less than 20



is less than eighteen but more than twelve.

Possible answers:

16, 17, 18, 19

13, 14, 15, 16, 17

What numbers could go in the boxes?

Explain your answer.

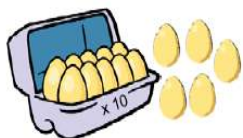
Order Groups of Objects

Reasoning and Problem Solving

The eggs are put into the baskets.

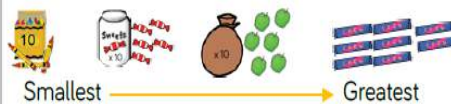
All the eggs are used.

How many solutions can you find?



Example: 8, 5, 2
or 9, 4, 1 etc.

Annie orders the following from
smallest to greatest:



Chris says:



This is the incorrect order
because there are more
apples than chew bars.

Do you agree with Chris?

Has Annie done anything else wrong?

I agree with Chris,
there are more
apples than chew
bars. There are
also more sweets
and crayons than
chew bars.

The order should
be:

chew bars,
crayons, sweets,
apples.

Order Numbers

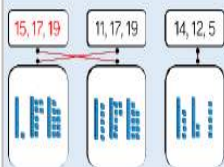
Reasoning and Problem Solving

Complete the image and match the
numerals to the correct picture.



11, 17, 19

14, 12, 5



Mr. Woolley says:



My number is
greater than 8
but less than
15

What could his number be?

Possible answers:

9, 10, 11, 12, 13 or
14