# Year 6 Maths Support – Week Beginning 18.05.20

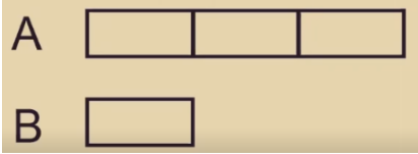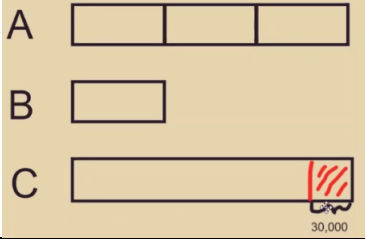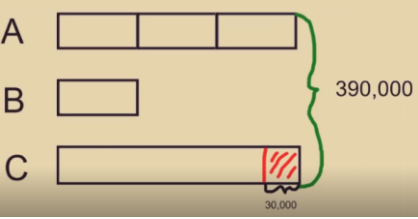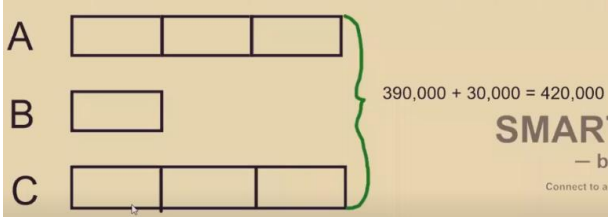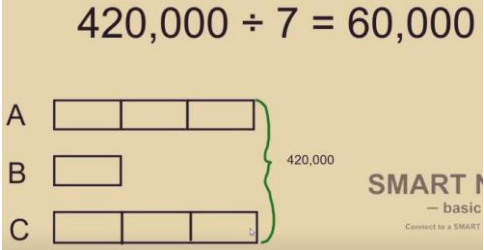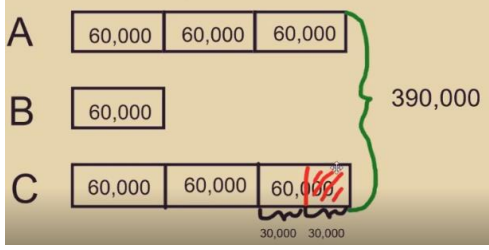| Theme | Word Problems lesson 1 | Word Problems lesson 2 | Word Problems lesson 3 | Negative Numbers lesson 1 | Negative Numbers lesson 2 |
|---|---|---|---|---|---|
| **Factual fluency (to aid fluency)** | Practise solving multi-step problems here | Practise solving missing information problems here | Practise a trial and error approach  here | Practise finding the order here | Solve problems with Venn diagrams here |
| **Problem/ activity of the day**<br><br>**Remember, just like in class, you can still show the depth of your knowledge LINK** | **(Lesson 1 resources below)**<br>**MAKING LINKS:**  In year 5 and 6, we learnt strategies for solving problems involving the four operations<br><br>**THINK: (support below)**<br>The population of town A is 3 times greater than the population of town B<br><br>The population of town A is 30,000 more town C<br><br>The total population of all 3 towns is 390, 000<br><br>What would this look like as a bar model?<br><br>What questions could we ask/answer using this information?<br><br>**SEE: (model below)**<br>Watch lesson video here.<br><br>**DO:** Use what you have learned today to solve the problems. | **(Lesson 2 resources below)**<br>**MAKING LINKS:**  In lesson 2, we learnt strategies for solving problems involving the four operations<br><br>**THINK: (support below)**<br>A wallet costs £24.90.<br><br>Six belts cost £16.30 **more** than the **total** of 3 wallets and 2 belts.<br><br>What would this look like as a bar model?<br><br>What questions could we ask/answer using this information?<br><br>**SEE: (model below)**<br>Watch lesson video here.<br><br>**DO:** Use what you have learned today to solve the problems. | **(Lesson 3 resources below)**<br>**MAKING LINKS:**  Over the last 2 days, we have tried a wide range of problems with different contexts. Today, we will apply that understanding<br><br>**THINK: (support below)**<br><br>$$974 \div 25 =$$<br><br>Solve the problem then think of word problems (some easier, some harder) linked to this calculation.<br><br>What real life situations would use this calculation?<br><br>TIP: You could try the following contexts:<br>- people sharing money<br>- making necklaces using beads<br>- putting liquid into containers<br><br>Challenge yourself to create and solve word problems using different numbers and calculations<br><br>**SEE: (model below)**<br>Watch lesson video here.<br><br>**DO:** Now try to solve the problems below. | **(Lesson 4 resources below)**<br>**MAKING LINKS:**  In year 5, we counted through zero with negative numbers<br><br>**THINK: (support below)**<br><br>$$4 - 7 = \text{-}3$$<br><br>$$\text{-}2 + 6 = 4$$<br><br>Are they correct? How many ways can you prove it?<br><br>What is the most efficient way to calculate with negative numbers?<br><br>**Explore:**<br>A number line<br>Number bonds / known facts<br>Bridging through zero<br>Compensation (1 – 6 = 0 – 5)<br><br>**SEE: (model below)**<br>Watch lesson video here.<br><br>**DO:** Use what you have learnt today to solve the problems. | **(Lesson 5 resources below)**<br>**MAKING LINKS:**  Yesterday, we learnt how to add and subtract with negative numbers<br><br>**THINK: (support below)**<br><br>$$3 - 9 =$$<br><br>Solve this then think of word problems (some easier, some harder) linked to this calculation.<br><br>**TIP:** You could try the following contexts:<br>- temperature<br>- water levels<br>- money<br>- goal difference<br><br>**SEE: (model below)**<br>Watch lesson video here.<br><br>**DO:** Use what you have learnt today to solve the problems. |
| **Time to check** | **Day 1 resources and answers (below)** | **Day 2 resources and answers (below)** | **Day 3 resources and answers (below)** | **Day 4 resources and answers (below)** | **Day 5 resources and answers (below)** |

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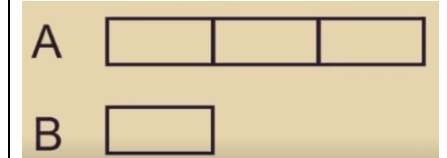
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## THINK:
The population of City A is 3 times greater than the population of City B
The population of City A is 30,000 more City C
The total population of all 3 towns is 390, 000
**What would this look like as a bar model? What can you find out? Think of some challenging questions to ask/answer**

## SEE: Watch lesson video here.

| | |
|---|---|
|  |  |
| The population of City A is 3 times greater than the population of City B | The population of City A is 30,000 more City C |
|  |  |
| The total population of all 3 towns is 390, 000 | Adding 30,000 to town C makes it equal to town A. Also, the bar model will now have 7 equal units. Don't forget that adding 30, 000 to Town C also adds 30, 000 on to the total |
|   420,000 ÷ 7 = 60,000 |  |
| Find the value of 1 unit by dividing the total by the number of equal units | Don't forget to go back to the original problem Town C's population is smaller than town A by 30, 000 people |

## DO:

1. Team A's stadium is three times larger than Team B's stadium.

Together, the stadiums hold 160, 000 fans.

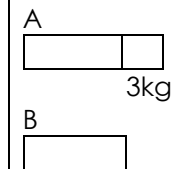**What is the capacity of Team A's stadium?**



TIPS: A + B = 4 units
What is the value of A + B?
What is the value of one unit?

2. Bag A and Bag B weigh 21 kg together.

Bag A is 3kg heavier than bag B.

**What is the weight of bag B?**

A
3kg
B

TIPS:
What is the value of the 2 equal units (boxes) in A and B together?
What is the value of 1 unit?
Remember that the boxes make 21Kg in total.

STUCK? Click here to view a similar method

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# THINK:

A wallet costs £24.90.
Six belts cost £16.30 more than the total of 3 wallets and 2 belts.
**What would this look like as a bar model?**
**What questions could we ask/answer using this information?**

## SEE: Watch lesson video here.

| | |
|---|---|
|  | **£24.90**  |

These are wallets and belts. Think about what you know about them and what they cost

In this problem, a wallet costs £24.90

| | |
|---|---|
|  | Six belts cost £16.30 more than the total of 3 wallets and **2 belts.**<br><br>6 belts = **2 belts** + 4 belts<br><br>Each part of the problem has **2 belts** in common so that is a good place to start the bar model |

| | |
|---|---|
|  | One part is 6 belts (2 belts + 4 belts)<br><br>The other part is 2 belts + 3 wallets<br><br>If you add £16.30 to the bottom part then both bars are the same size |

| | |
|---|---|
|  |  |
| 3 wallets + £16.30 = 4 wallets<br>3 wallets + £16.30 = £91.00<br>4 belts = £91.00 | 1 belt= £91.00 ÷ 4<br>1 belt = £22.75 |

Tip: Try to find something in common between the bars you are comparing

# DO:

1. Together, a jug, a bottle and a cup contain 1,900 ml of water.

The jug contains three times as much water as the cup.

The bottle contains 400ml more water than the cup.

**How much water is there in the jug?**

Jug
| | | |
|---|---|---|
| | | |

Cup
| |
|---|
| |

Bottle
| | |
|---|---|
| | 400 ml more |

**TIPS:**
Take away the extra ml from the total. How many ml are there now?
How many equal units (or boxes) without the extra ml are there?
What is the value of 1 unit?

## STUCK?
**Click here to view a similar method**

2. Child A bought 6 pizzas.

Child B bought 2 pizzas.
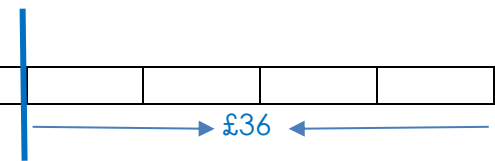
Altogether, Child A spent £36 more than Child B.

**How much did each pizza cost? How much did each child pay?**

Child A
| | | | | | |
|---|---|---|---|---|---|
| | | | | | |

£36

Child B
| | |
|---|---|
| | |

TIPS: How many units (boxes) represent £36?
What is the value of one unit?

## THINK:

$$974 \div 25 = ?$$

Solve the problem then think of other word problems (some easier, some harder) linked to this calculation.

TIP: You could try the following contexts: people sharing money / making necklaces using beads / putting liquid into containers
What other numbers and calculations would work well for these contexts? Consider what the remainder might represent as a decimal and a fraction.

## SEE: Long division here

**Appropriate contexts and problems:**

- £974 is shared equally among 25 people. How much money does each person receive? Answer: Each person receives £25.96

- A necklace is made using 25 beads. How many necklaces can be made using 974 beads? Answer: 38 necklaces (with 24 beads left over)

- 974ml of liquid is poured into 25ml containers. How many containers are needed to hold all the soap? Answer: 39 containers are needed (one container will not be full)

```
       38 r 24
25 │ 974              25
  -  750  (25 x 30)   50
                      75
     224              100
  -  200  (25 x 8)    125
                      150
on 1   24             175
                      200
                      225
```

**Long division:**
1. Write out multiples of the divisor (25) to one side
2. Subtract the largest multiple that you can from the dividend (974)
3. Subtract another multiple from what is left
4. Repeat this until you cannot subtract any more
5. Check your answer using multiplication (974 = 25 x 38 + 24)
Challenge yourself with other calculation methods here

```
      38 r 24
25 │ 974
```

$$38 \frac{24}{25}$$

38 r24 means $38\frac{24}{25}$

The remainder is always the numerator and the divisor is always the denominator

$$\frac{24}{25} = \frac{96}{100} = 0.96$$
(x 4)

Find remainders as a decimal by converting into tenths, hundredths or thousandths

$$974 \div 25 = 38 \text{ r}24 = 38\frac{24}{25} = 38.96$$

You can give your remainder 3 different ways. Use all 3 when creating and solving your problems

## DO: *Solve these problems*

1. Holly has 712ml of lemon juice. 28ml of lemon juice is needed for each cup of lemonade.

**How many cups of lemonade can she make?**

TOP TIPS
Multiples of 28: 28, 56, 84, 112, 140…
Which multiple of 28 is closest to 748ml?
28 x 2 = 56
28 x 20 = 560
How much is left after subtracting 560?
Can it be divided by 28?

2. An 18.9m length of wire is cut equally into 35 parts.

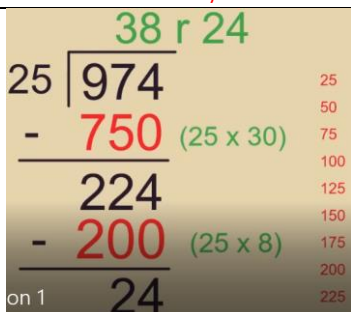**What is the length of each part?**

TOP TIPS
Convert 18.9m into cm
1m = 100cm

3. A baker used 52g of flour to make one cupcake.

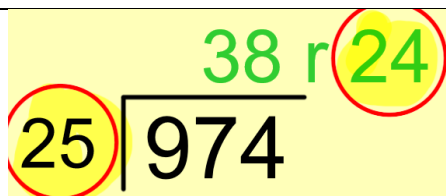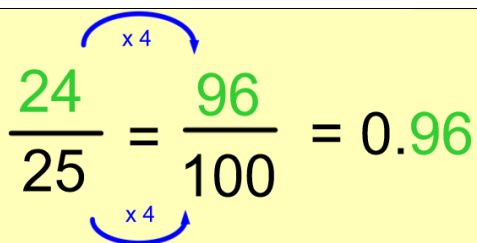**What is the largest number of cupcakes he can make with 1kg of flour?**

TOP TIPS
1kg = 1000g

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**THINK: look at these calculations**

| 4 – 7 = -3 | -2 + 6 = 4 |
|---|---|

Are they correct? How many ways can you prove it?
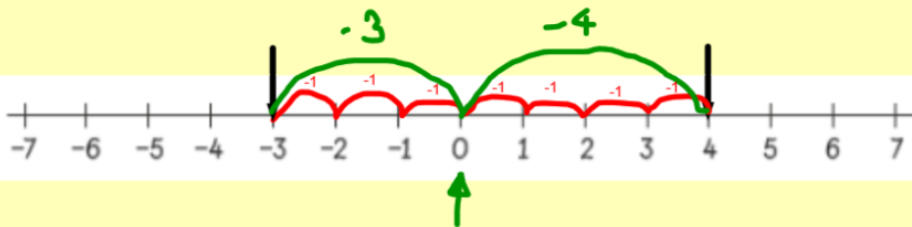What is the most efficient way to calculate with negative numbers?

Explore:
A number line
Number bonds / known facts
Bridging through zero
Compensation (1 – 6 = 0 – 5)

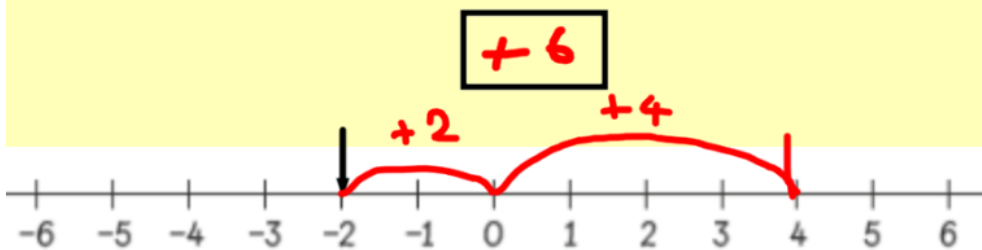**SEE:** Watch lesson video here.

## 4 – 7 = -3



bridge through zero

When subtracting, you move from right to left
Bridging through zero makes it easier to add and subtract negative numbers mentally

## -2 + 6 = 4



When adding, you move from left to right
Bridging through zero makes it easier to add and subtract negative numbers mentally

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**DO:**

*Solve these problems*

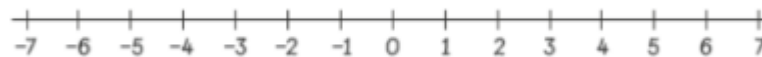| a) 2 – 3 = | b) 2 – 4 = | c) 3 – 5 = |
|---|---|---|
| d) 1 – 4 = | e) -3 + 4 = | f) -1 – 2 = |
| g) 5 – 6 = | h) 3 – 7 = | i) -2 – 3 = |
| j) -4 + 9 = | k) -5 + 7 = | l) 0 – 3 = |
| m) -2 + 9 = | n) 7 – 9 = | o) -4 + 5 = |
| p) -1 – 7 = | q) 0 – 6 = | r) 4 – 10 = |
| s) 1 – 8 = | t) -6 + 6 = | u) -6 + 16 = |
| v) -12 – 8 = | | |

TOP TIPS
Use a number line.
Place the first number given in your calculation on the number line.
If +, move to the right as many steps as the calculation says.
If -, move to the left as many steps as the calculation says.

E.g. -4 - 2 = -6



Move 2 steps to the left as it says – 2

The answer is -6

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## THINK:

$$3 - 9 = ?$$

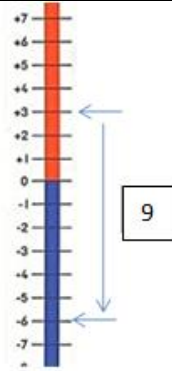Solve this then think of word problems (some easier, some harder) linked to this calculation.
TIP: You could try the following contexts: temperature / water levels / money / goal difference
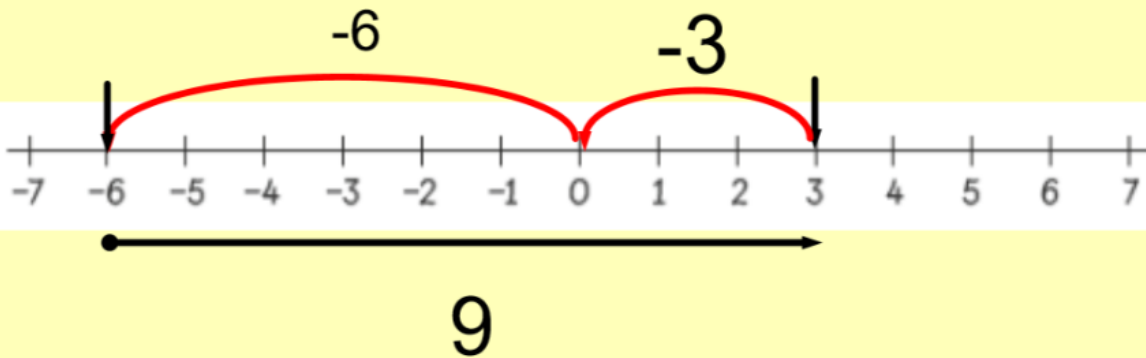
## SEE: Watch lesson video here.

$$3 - 9 = -6$$

The temperature was 3 °C in the day time and it dropped to -6 °C. What is the difference between the day time and night time temperature?

The shoe shop was on Level 3 of the shopping centre and the lift went down 9 floors to the car park. What level was the car park on?

9

Team A conceded 9 goals last season and had a goal difference of -6. How many goals did they score?

-6      -3

9

When subtracting, you move from right to left (or top to bottom)
When adding, you move from left to right (or bottom to top)
Bridging through zero makes it easier to add and subtract negative numbers mentally

## DO:
### Solve these problems

**1. Four friends have a penalty shootout**

Each player **receives 4 points for every goal they score**

Each player **has 2 points deducted (taken away) for every shot they miss**

Calculate the score for each player

|  | **Number of goals** | **Number of misses** | **Score** |
|---|---|---|---|
| **Example** | 1<br>(points: 4 as 4 x 1 = 4) | 3<br>(points: -6 as -2 x 3 = -6) | **4 – 6 = -2** |
| **Person A** | 2<br>(points: 8 as __ x __ = ) | 5<br>(points: -10 as -2 x 5 = -10) | |
| **Person B** | 1 | 6 | |
| **Person C** | 0 | 7 | |
| **Person D** | 3 | 4 | |

TOP TIPS
Annotate your calculations in the table like in the examples in red.
Use a number line to work out the final score.

**2.** Create a tricky negative number quiz and league table for people at home (20 questions)

Each player scores 2 points for a correct answer

Each player loses 3 points for an incorrect answer

# ANSWERS:

| Lesson 1 Answers | Lesson 2. Answers | Lesson 3. Answers | Lesson 4 Answers | | | Lesson 5 Answers |
|---|---|---|---|---|---|---|

**Lesson 1 Answers**

1. Answer: 120,000
160, 000 ÷ 4 = 40, 000 (1 unit)
40, 000 x 3 = 120,000 (3 units)

2. Bag B weighs 9kg and Bag A weighs 12kg  (9kg + 3 kg)
21 – 3= 18 (2 units)
18 ÷ 2 = 9

**Lesson 2. Answers**

1.  Jug: 900ml
**Solution: (1900 – 400) ÷5 = 300 (1 unit)**
**Cup 300ml**
**Bottle 700ml**

2. Each pizza costs £9
**Solution: 4 bars = 36**
**1 bar = 36 ÷ 4 = 9**

Child A spent £54
**£9 x 6 = £54**

Child B spent £18
**£9 x 2 = £18**

**Lesson 3. Answers**

1. Holly can make 25 cups of lemonade
**Solution: 712 ÷ 28 = 25r12 = $25\frac{12}{28}$= $25\frac{3}{7}$**

2. The length of each part is 0.54m or 54cm
**Solution: 1890 ÷ 35 = 54**

3. The baker can bake 19 cupcakes
**Solution: 1000 ÷ 52 = 19r12 = $19\frac{12}{52}$ = $19\frac{3}{13}$**

**Lesson 4 Answers**

| a) 2 – 3 = -1 | b) 2 – 4 = -2 | c) 3 – 5 = -2 |
|---|---|---|
| d) 1 – 4 = -3 | e) -3 + 4 = 1 | f) -1 – 2 = -3 |
| g) 5 – 6 = -1 | h) 3 – 7 = -4 | i) -2 – 3 = -5 |
| j) -4 + 9 = 5 | k) -5 + 7 = 2 | l) 0 – 3 = -3 |
| m) -2 + 9 = 7 | n) 7 – 9 = -2 | o) -4 + 5 =1 |
| p) -1 – 7 = -8 | q) 0 – 6 = -6 | r) 4 – 10 = -6 |
| s) 1 – 8 = -7 | t) -6 + 6 = 0 | u) -6 + 16 = 10 |
| v) -12 – 8 = -20 | | |

**Lesson 5 Answers**

**Person A = -2**
**4 + 4 – 2 – 2 – 2 – 2 – 2 = (2 x 4) + (5 x -2) = 8 – 10 = -2**

**Person B = -8**
**4– 2 – 2 – 2 – 2 – 2 - 2 = (1 x 4) + (6 x -2) = 4 – 12 = -8**

**Person C = -14**
**– 2 – 2 – 2 – 2 – 2 – 2 – 2  = (7 x -2) = -14**

**Person D = 4**
**4 + 4 + 4 – 2 – 2 – 2 – 2  = (3 x 4) + (4 x -2) = 12 – 8 = 4**

**2.** Answers will vary