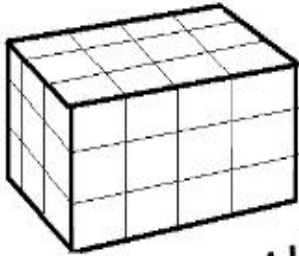


Level 2: Number, Money and Measure



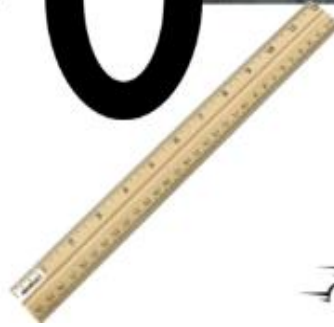
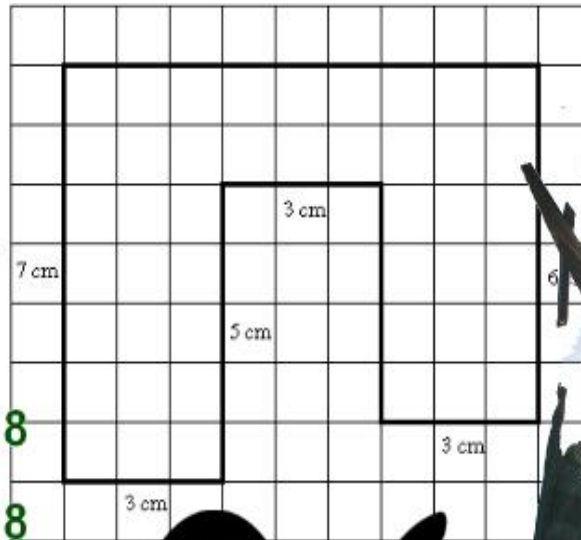
$$\frac{1}{4} + \frac{1}{4} + \frac{1}{2}$$

Step 1: $6h = 18$

Step 2: $6h = 18$

Step 3: $\frac{6h}{\cancel{6}} = \frac{18 \div 6}{3}$

Step 4: $h = 3$



Level 2: Number, Money and Measure

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1. Whole Number Calculations (MNU 2-03a)

1. Complete the following **MENTALLY**:

- a) $26 + 52$ b) $81 + 19$ c) $45 + 10$ d) $59 + 12$ e) $23 + 47$
f) $670 + 110$ g) $950 + 240$ h) $7100 + 2000$ i) $2900 + 4200$ j) $46\ 000 + 17\ 000$

2. Complete the following **MENTALLY**:

- a) $74 - 52$ b) $81 - 29$ c) $55 - 10$ d) $57 - 13$ e) $83 - 47$
f) $660 - 120$ g) $850 - 220$ h) $7000 - 2400$ i) $3900 - 3200$ j) $16\ 000 - 10\ 000$

3. Complete the following :

- a) 74×3 b) 51×2 c) 57×5 d) 85×6 e) 41×9
f) 3×320 g) 5×455 h) 8×129 i) 1249×5 j) 5242×4

4. Complete the following:

- a) $75 \div 5$ b) $810 \div 9$ c) $366 \div 6$ d) $488 \div 8$ e) $497 \div 7$
f) $2715 \div 6$ g) $2440 \div 4$ h) $3333 \div 3$ i) $9526 \div 2$ j) $6315 \div 5$

5. At a football match there were 23 850 Scotland supporters and 28 450 Republic of Ireland supporters.

What was the total attendance for the game?

6. A supermarket bought 850 apples last week.

They sold 672. How many went to waste?

7. Louise bought 4 bottles of water at 60p each.

How much did this cost her?

8. A family of 6 win £36000.

If the money is shared equally, how much will they each receive?

9. Write the answers to the following:

a) 26×10

b) 81×10

c) 45×10

d) 159×10

e) 203×10

f) 6780×10

g) 95×10

h) 7119×10

i) 2922×10

j) $46\,232 \times 10$

10. Write the answers to the following:

a) 16×100

b) 82×100

c) 75×100

d) 249×100

e) 409×100

f) 8780×100

g) 85×100

h) 8819×100

i) 2912×100

j) $46\,500 \times 100$

11. Write the answers to the following:

a) 19×1000

b) 92×1000

c) 35×1000

d) 749×1000

e) 479×1000

f) 5280×1000

g) 45×1000

h) 8899×1000

i) 9912×1000

j) $86\,500 \times 1000$

12. Write the answers to the following:

a) $260 \div 10$

b) $810 \div 10$

c) $450 \div 10$

d) $190 \div 10$

e) $230 \div 10$

f) $6780 \div 10$

g) $9500 \div 10$

h) $7110 \div 10$

i) $2920 \div 10$

j) $46\,230 \div 10$

13. Write the answers to the following:

a) $200 \div 100$

b) $800 \div 100$

c) $400 \div 100$

d) $1900 \div 100$

e) $2300 \div 100$

f) $99\,800 \div 100$

g) $21\,000 \div 100$

h) $61\,100 \div 100$

i) $87\,200 \div 100$

j) $59\,200 \div 100$

14. Write the answers to the following:

a) $7000 \div 1000$

b) $9000 \div 1000$

c) $1000 \div 1000$

d) $6000 \div 1000$

e) $2000 \div 1000$

f) $99\,000 \div 1000$

g) $21\,000 \div 1000$

h) $61\,000 \div 1000$

i) $87\,000 \div 1000$

j) $59\,000 \div 1000$

2. Rounding to the nearest 10, 100, 1000 (MNU 2-01a)

1. Round the following to the **nearest 10**:

- | | | | | |
|---------|---------|---------|---------|-----------|
| a) 26 | b) 81 | c) 45 | d) 159 | e) 203 |
| f) 678 | g) 95 | h) 711 | i) 292 | j) 6 |
| k) 1422 | l) 5037 | m) 3999 | n) 6001 | o) 12 345 |

2. Round the following to the **nearest 100**:

- | | | | | |
|---------|---------|---------|---------|-----------|
| a) 120 | b) 480 | c) 750 | d) 195 | e) 321 |
| f) 901 | g) 50 | h) 852 | i) 849 | j) 1130 |
| k) 2911 | l) 5090 | m) 8820 | n) 9999 | o) 10 002 |

3. Round the following to the **nearest 1000**:

- | | | | | |
|-----------|-----------|-----------|-----------|------------|
| a) 1100 | b) 3090 | c) 4500 | d) 8900 | e) 500 |
| f) 2499 | g) 6002 | h) 9500 | i) 10 100 | j) 25 324 |
| k) 63 750 | l) 27 800 | m) 50 499 | n) 99 999 | o) 100 500 |

3. Rounding to Estimate the Answer (MNU 2-01a)

1. Round to **approximate** the answers to the following:

a) 27×9

b) 433×11

c) 9×622

d) 331×12

e) 689×99

f) 99×156

g) 649×101

h) 1001×921

i) 3045×101

j) $11\,204 \times 11$

k) $60\,004 \times 999$

l) $99\,999 \times 9$

2. Now use a calculator to find the **exact** answer to the problems above.

3. Discuss the difference between the **approximate** value and the **exact** value. How do they compare?



Now Try... **THE LORD OF THE RINGS** Whole Numbers!

5. Decimal Calculations (MNU 2-03b)

1. Work out the following:

- | | | | |
|-------------------|--------------------|--------------------|----------------------|
| a) $2.3 + 8.5$ | b) $1.73 + 5.19$ | c) $3.5 + 8.12$ | d) $12.33 + 9.8$ |
| e) $7.4 - 5.2$ | f) $13.6 - 10.8$ | g) $1.75 - 0.9$ | h) $6.2 - 5.98$ |
| i) 3.2×5 | j) 12.8×2 | k) 5.91×3 | l) 303.19×4 |
| m) $54.6 \div 6$ | n) $8.4 \div 7$ | o) $13.5 \div 5$ | p) $127.5 \div 3$ |

2. Calculate:

- | | | | |
|-----------------------|------------------------|-----------------------|------------------------|
| a) 1.2×10 | b) 45.3×10 | c) 31.43×100 | d) 171.24×10 |
| e) 0.87×100 | f) 9.213×1000 | g) 52.31×10 | h) 13.441×10 |
| i) 123.1×100 | j) 2.34×10 | k) 4.12×100 | l) 13.24×1000 |

3. Calculate:

- | | | | |
|---------------------|-------------------|----------------------|----------------------|
| a) $411.3 \div 100$ | b) $18.5 \div 10$ | c) $322.21 \div 100$ | d) $810.1 \div 1000$ |
| e) $328 \div 10$ | f) $57.6 \div 10$ | g) $155.5 \div 1000$ | h) $634.2 \div 10$ |
| i) $123.1 \div 100$ | j) $2.34 \div 10$ | k) $4.12 \div 100$ | l) $13.24 \div 1000$ |

4. Peter earns £28 340 per year. He is paid monthly.
What is Peter's monthly wage?

6. 10 people pay £14.55 each for a meal.
How much would the total bill be?

7. Paul buys a football for £7.99. Adam buys a football for £5.25.
How much cheaper was Adam's?

8. Louise buys a handbag at £25.25 and a pair of shoes for £29.99.
What change would she receive from £100?

6. Order of Operations (MTH 2-03c)

1. Work out the answers to the following:

(a) $4 + 3 - 5$

(b) $7 - 2 + 5$

(c) $8 - 1 + 9$

(d) $10 + 4 - 11$

(e) $5 + 15 - 18$

(f) $16 - 10 + 3$

(g) $19 - 18 + 3$

(h) $40 - 25 + 15$

2. Using the correct order of operations, work out the following:

(a) $5 + 7 \times 3$

(b) $8 - 2 \times 3$

(c) $19 - 6 \times 3$

(d) $5 - 40 \div 10$

(e) $5 + 15 \div 3$

(f) $11 - 30 \div 3$

(g) $20 - 40 \div 2$

(h) $40 - 10 \times 3$

(i) $9 - 20 \div 4$

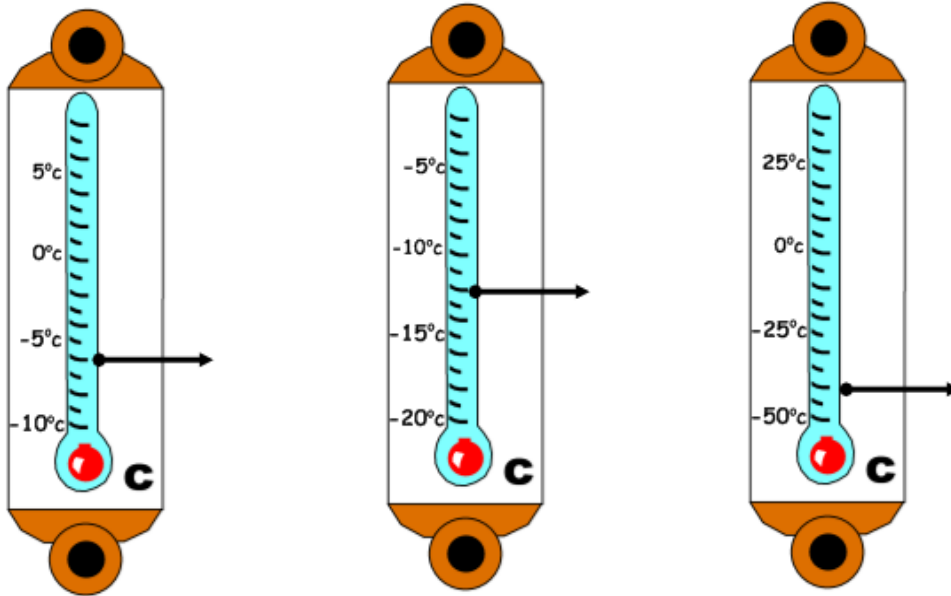
(j) $10 - 50 \div 10$

(k) $100 - 40 \times 2$

(l) $1 + 1 \times 8$

7. Integers in a Real-Life Context (MNU 2-04a)

1. What are the temperatures shown below?



2. Jack had £15 in his bank account and he withdrew £20.
What will his bank balance be?

3. Ryan had £0 in his bank account and he withdrew £50.
What will his bank balance be?

4. Daniel's bank balance was (-£10) and he withdrew £50.
What will his bank balance be now?

5. Lisa's bank balance was (-£142).
How much would she need to deposit into the bank to clear her overdraft?

8. Multiples and Factors (MTH 2-05a)

1. Write out the **first six multiples** of the following numbers:

- | | | | | |
|-------|-------|-------|-------|--------|
| a) 6 | b) 8 | c) 4 | d) 3 | e) 5 |
| f) 10 | g) 11 | h) 16 | i) 15 | j) 20 |
| k) 45 | l) 22 | m) 35 | n) 50 | o) 100 |

2. Write out the **complete set of factors** for the following numbers:

- | | | | | |
|-------|-------|-------|-------|--------|
| a) 4 | b) 1 | c) 2 | d) 9 | e) 7 |
| f) 5 | g) 6 | h) 10 | i) 12 | j) 16 |
| k) 24 | l) 30 | m) 40 | n) 63 | o) 100 |

9. Simple Sequences (MTH 1-13b)

1. Give a possible **rule** used in these sequences :

a) 1, 3, 5, 7, 9

b) 6, 11, 16, 21, 26

c) 45, 40, 35, 30, 25

d) 25, 50, 100, 200

e) 40, 20, 10, 5

f) 81, 27, 9, 3

g) 49, 42, 35, 28

h) 12, 24, 36, 48

i) 1, 10, 100, 1000

j) 4, 8, 12, 16

k) 10, 8, 6, 4

l) 0.5, 1, 1.5, 2

2. Find the **next three numbers** in these sequences :

a) 3, 6, 9, 12, 15

b) 5, 10, 15, 20, 25

c) 100, 90, 80, 70

d) 2, 4, 6, 8, 10

e) 1000, 100, 10, 1

f) 64, 56, 48, 40

g) 11, 22, 33, 44

h) 1, 2, 4, 8

i) 48, 44, 40, 36

j) 6, 18, 54, 162

k) 18, 21, 24, 27

l) 2, 2.5, 3, 3.5

10. Equivalent Fractions, Decimals & Percentages (MNU 2-07b)

Complete the table, filling in all blanks:

| <u>Fraction</u> | <u>Percentage</u> | <u>Decimal</u> |
|-----------------|-------------------|----------------|
| $\frac{1}{2}$ | 50% | |
| $\frac{1}{4}$ | | 0.25 |
| | $33\frac{1}{3}\%$ | 0.33... |
| $\frac{1}{5}$ | | 0.2 |
| $\frac{1}{10}$ | 10% | |
| | 5% | 0.05 |
| | 1% | |

11. Fractions & Percentages of a Quantity (MNU 2-07a)

1. Calculate the following:

- | | | |
|----------------------------|--------------------------------|------------------------------|
| (a) $\frac{1}{2}$ of £10 | (b) $\frac{1}{2}$ of £20 | (c) $\frac{1}{2}$ of £8 |
| (d) $\frac{1}{3}$ of £9 | (e) $\frac{1}{3}$ of £27 | (f) $\frac{1}{3}$ of £12 |
| (g) $\frac{1}{4}$ of £16 | (h) $\frac{1}{4}$ of £20 | (i) $\frac{1}{4}$ of £28 |
| (j) $\frac{1}{5}$ of £50 | (k) $\frac{1}{5}$ of £30 | (l) $\frac{1}{5}$ of £10 |
| (m) $\frac{1}{10}$ of £90 | (n) $\frac{1}{6}$ of £36 | (o) $\frac{1}{10}$ of 40 kg |
| (p) $\frac{1}{7}$ of 21 cm | (q) $\frac{1}{9}$ of 45 metres | (r) $\frac{1}{20}$ of £200 |
| (s) $\frac{1}{5}$ of 75 kg | (t) $\frac{1}{10}$ of £300 | (u) $\frac{1}{100}$ of £1000 |

2. Calculate the following:

- | | | |
|------------------------------|------------------------------|------------------------------------|
| (a) 10% of £100 | (b) 10% of £80 | (c) 10% of 50 kg |
| (d) 50% of £16 | (e) 50% of £50 | (f) 50% of £40 |
| (g) 25% of £24 | (h) 25% of £20 | (i) 25% of £32 |
| (j) $33\frac{1}{3}\%$ of £30 | (k) $33\frac{1}{3}\%$ of £15 | (l) $33\frac{1}{3}\%$ of 90 metres |
| (m) 20% of £50 | (n) 20% of £35 | (o) 20% of 15 kg |
| (p) 5% of 60 cm | (q) 5% of 100 metres | (r) 5% of £200 |
| (s) 1% of 100 kg | (t) 1% of £500 | (u) 1% of 900 cm |

12. Preferred Method Calculations (MNU 2-07b)

1. Work out the following using your preferred method of calculation:

- | | | |
|--------------------------------|------------------------------|-----------------------------|
| (a) $\frac{1}{2}$ of £50 | (b) 0.1 of £20 | (c) 50% of £80 |
| (d) $\frac{1}{4}$ of 24 metres | (e) 0.5 of £10 | (f) 0.01 of 400 grams |
| (g) 10% of £120 | (h) $\frac{1}{3}$ of 90 cm | (i) 25% of £28 |
| (j) $\frac{1}{5}$ of 25 kg | (k) 0.33... of 300 cm | (l) $\frac{1}{10}$ of £1000 |
| (m) 0.2 of 50 kg | (n) 0.5 of 400 grams | (o) $\frac{1}{4}$ of 40 kg |
| (p) 5% of 80 cm | (q) 0.05 of £200 | (r) 0.01 of £700 |
| (s) $\frac{1}{2}$ of 36 kg | (t) $\frac{1}{100}$ of £1200 | (u) 1% of 2500 cm |

2. Stacey wants to buy a dress which costs £120. She notices it is on sale with 10% off the original price. How much does the dress now cost?
3. Gavin wants to buy a jumper. The original price of the jumper was £80. It is now on sale at half price. How much does the jumper now cost?
4. Jack and his four brothers have to share 100 sweets among them. Each brother gets $\frac{1}{5}$ of the 100 sweets. How many sweets does Jack get?

13. Simplifying and Equivalent Fractions (MTH 2-07c)

1. Find three fractions **equivalent** to the following:

eg. $\frac{1}{7} = \frac{2}{14} = \frac{3}{21}$

$\frac{5}{7} = \frac{10}{14} = \frac{15}{21}$

- | | | | | |
|--------------------|--------------------|---------------------|--------------------|---------------------|
| (a) $\frac{1}{2}$ | (b) $\frac{1}{3}$ | (c) $\frac{1}{4}$ | (d) $\frac{1}{5}$ | (e) $\frac{1}{10}$ |
| (f) $\frac{2}{3}$ | (g) $\frac{3}{4}$ | (h) $\frac{3}{5}$ | (i) $\frac{4}{5}$ | (j) $\frac{7}{10}$ |
| (k) $\frac{1}{6}$ | (l) $\frac{1}{20}$ | (m) $\frac{1}{100}$ | (n) $\frac{2}{7}$ | (o) $\frac{3}{8}$ |
| (p) $\frac{9}{10}$ | (q) $\frac{6}{11}$ | (r) $\frac{5}{7}$ | (s) $\frac{3}{10}$ | (t) $\frac{9}{100}$ |

2. Write these fractions in their **simplest** form:

- | | | | | |
|---------------------|---------------------|----------------------|---------------------|------------------------|
| (a) $\frac{30}{40}$ | (b) $\frac{10}{30}$ | (c) $\frac{10}{15}$ | (d) $\frac{4}{8}$ | (e) $\frac{6}{18}$ |
| (f) $\frac{2}{12}$ | (g) $\frac{3}{12}$ | (h) $\frac{3}{15}$ | (i) $\frac{4}{16}$ | (j) $\frac{7}{21}$ |
| (k) $\frac{2}{6}$ | (l) $\frac{15}{20}$ | (m) $\frac{50}{100}$ | (n) $\frac{12}{27}$ | (o) $\frac{30}{35}$ |
| (p) $\frac{9}{36}$ | (q) $\frac{8}{28}$ | (r) $\frac{25}{30}$ | (s) $\frac{33}{55}$ | (t) $\frac{900}{1000}$ |

14. Ordering Fractions (MTH 2-07c)

Arrange the fractions in order from **smallest to largest** :

(a) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}$

(b) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{2}{5}, \frac{3}{10}$

(c) $\frac{1}{10}, \frac{3}{10}, \frac{7}{10}, \frac{9}{10}$

(d) $\frac{3}{5}, \frac{2}{5}, \frac{4}{5}, \frac{1}{5}, \frac{1}{2}$

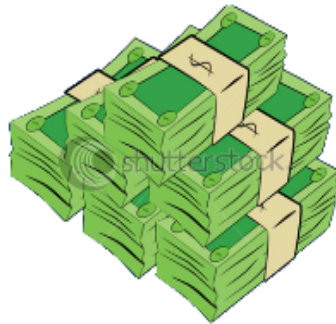
(e) $\frac{3}{10}, \frac{1}{3}, \frac{3}{4}, \frac{3}{5}, \frac{11}{20}$

(f) $\frac{5}{6}, \frac{2}{3}, \frac{1}{2}, \frac{2}{5}, \frac{1}{4}$

15. Managing Money and Comparing Costs (MNU 2-09a)

In groups of 3 you must manage the finances of your very own Football Club:

- 1) Buy Players.
- 2) Choose the best Sponsorship deal for your club.
- 3) Build a Stadium.
- 4) Decide on other contracts.
- 5) Successfully budget and manage your finances throughout an entire football season.



16. Bank Cards and Importance of Budgeting (MNU 2-09b)

Your task is to research how bank cards operate and the responsibility required when possessing a bank card.



Have a class discussion/activity on the importance of budgeting effectively.

17. Profit and Loss (MNU 2-09c)

1. Liam sold his bike to his younger brother. He had bought the bike for £145 and sold it to his brother for £100.
Calculate Liam's loss.



2. Callum has antique football cards. He bought one of them for £1. He has since sold it for £5.
Calculate his profit.
3. Sophie bought her dolls house for £100. It is now an antique and she can sell it for at least £250.
What profit will she make if she sells it?
4. Clare bought her car five years ago for £2450. She is now trading it in and the car dealership is offering her £560.
How much of a loss will Clare make?



5. Paul's football shirt collection has cost him £2400 altogether. He sells his collection on eBay for £2090.
Has Paul made a profit? If not, how much was his loss?
6. Olivia spent £90,000 when buying her house four years ago. The market value of her house is now £105,000.
Will she make a profit if she sells the house?
If so, what will Olivia's profit be?

18. Different Units of Time (MNU 2-10b)

1. Change the following into **hours** or **hours and minutes**:

- (a) 60 minutes (b) 120 minutes (c) 240 minutes
(d) 75 minutes (e) 125 minutes (f) 180 minutes

2. Change the following into **minutes**:

- (a) 3 hours (b) 5 hours (c) 2 hours & 30 minutes
(d) 1 hour & 40 minutes (e) 3 hours & 45 minutes (f) 2 hours and 55 minutes

3. Change the following into **seconds**:

- (a) 1 minute (b) 2 minutes (c) 5 minutes
(d) 10 minutes (e) 1 minute 30 seconds (f) 2 minutes 45 seconds

4. Change the following into **minutes** or **minutes and seconds**:

- (a) 120 seconds (b) 240 seconds (c) 90 seconds
(d) 125 seconds (e) 200 seconds (f) 305 seconds

5. Calculate the following:

- (a) How many hours are in a day (b) How many days are in a week
(c) How many months are in a year (d) How many seconds in a minute
(e) Minutes in an hour

19. Time Calculations (MNU 2-10a)

- Convert the following into **24 hour time**:
 - 3.40 am
 - 7.15 pm
 - 10.20 am
 - 12.55 pm
 - 5.05 pm
 - 11 pm
 - 1.30 am
 - 4.45 pm
 - 8 am
 - midnight
 - midday
 - 2.07 am
 - 1.43 pm
 - 2.33 pm
 - 12.01 am
- Convert the following into **12 hour time**:
 - 04:30
 - 11:20
 - 13:15
 - 09:40
 - 12:05
 - 00:15
 - 18:25
 - 23:55
 - 08:00
 - 20:00
 - 00:01
 - 12:00
 - 21:51
 - 15:39
 - 06:08
- Anna's flight left *Glasgow International Airport* at 09:15 and arrived at *Heathrow* in London at 10:30.
Using a timeline, calculate how long the flight was.
- On the same day Billy is getting a train to London. His train departs *Central Station* at exactly 5.30 am. The journey will take 4 hours and 40 minutes.
Does Billy arrive in London before Anna?
Give a reason for your answer.
- Fiona is driving from *Glasgow* to *St Andrews*. She leaves at 09:20 and arrives at 12.10 pm.
Calculate her journey time using an appropriate method.

6.

| London Bristol Parkway - Cardiff - Swansea Cheltenham - Bath - Bristol | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|
| Sundays from 26 July | | | | | | | | | |
| London Paddington | 1903 | 1915 | 1930 | 2000 | 2030 | 2100 | 2130 | 2200 | 2215 |
| Reading | 1935 | 1945 | 2003 | 2030 | 2100 | 2130 | 2200 | 2230 | 2245 |
| Didcot Parkway | 1949 | - | 2017 | 2044 | 2114 | 2144 | 2214 | 2244 | 2259 |
| Swindon | 2009 | 2015 | 2036 | 2103 | 2133 | 2203 | 2233 | 2303 | 2319 |
| Kemble | 2022 | - | - | - | - | - | 2250 | - | - |
| Stroud | 2037 | - | - | - | - | - | 2305 | - | - |
| Stonehouse | 2042 | - | - | - | - | - | 2310 | - | - |
| Gloucester | 2053 | - | - | - | - | - | 2323 | - | - |
| Cheltenham Spa | 2108 | - | - | - | - | - | 2335 | - | - |
| Chippenham | - | - | 2049 | - | 2145 | - | 2245 | - | 2332 |
| Bath Spa | - | 2035 | 2105 | - | 2157 | - | 2257 | - | 2343 |
| Bristol Parkway | - | - | - | 2129 | - | 2229 | - | 2329 | - |
| Bristol Temple Meads | - | 2051 | 2117 | - | 2211 | - | 2311 | - | 2357 |
| Weston-super-Mare | - | 2110 | - | - | - | - | - | - | 0018 |
| Newport | - | - | - | 2149 | - | 2249 | - | 2353 | - |
| Hereford | - | - | - | - | - | - | - | - | - |
| Cardiff Central | - | - | - | 2205 | - | 2305 | - | 0014 | - |
| Bridgend | - | - | - | 2225 | - | 2325 | - | 0034 | - |
| Port Talbot Parkway | - | - | - | 2237 | - | 2337 | - | 0046 | - |
| Neath | - | - | - | 2244 | - | 2344 | - | 0053 | - |
| Swansea | - | - | - | 2257 | - | 2357 | - | 0106 | - |

The timetable above is from a London train line. Calculate:

- The time taken for the 19:03 train to reach Stroud.
- The time taken for the 20:00 train to travel from Swindon to Bristol Parkway.
- The time taken for the 22:15 train to travel from London Paddington to Weston-Super-Mare.



Now try

DOCTOR WHO



Timeline Challenge!








20. Discovering Speed, Distance & Time (MNU 2-10c)

In pairs you must create an experiment which examines the link between speed, distance and time.

From your experiment you must write a short summary of your findings and report these findings to the rest of your class.

21. Estimating Size (MNU 2-11a)

Using either millimetres, centimetres, metres or kilometres, estimate the size of the following:

- (a) Length of a spider.  (b) Height of your teacher.
- (c) Width of your desk. (d) Wingspan of a WW2 Spitfire. 
- (e) Distance from the Earth to the moon.  (f) Height of a T-Rex. 
- (g) Height of your school building. (h) Perimeter of Glasgow.
- (i) Wingspan of a butterfly.  (j) Width of football goals.

Now find out the actual size of the above examples.
How close was your estimate?

22. Converting Units of Measure (MNU 2-11b)

1. Change the following into **millimetres**:

- a) 4 cm b) 9 cm c) 15 cm d) 5.3 cm
e) 11.7 cm f) $3\frac{1}{2}$ cm g) 0.8 cm h) 0.05 cm

2. Change the following into **centimetres**:

- a) 5 m b) 9 m c) 12 m d) 3.5 m
e) $\frac{1}{2}$ m f) $5\frac{1}{2}$ m g) 0.7 m h) 0.09 m

3. Change the following into **metres**:

- a) 9 km b) 11 km c) 4 km d) 2.5 km
e) $\frac{1}{2}$ km f) $7\frac{1}{2}$ km g) 0.2 km h) 0.04 km
i) 500 cm j) 20 cm k) 1350 cm l) 2 cm

4. Change the following into **kilometres**:

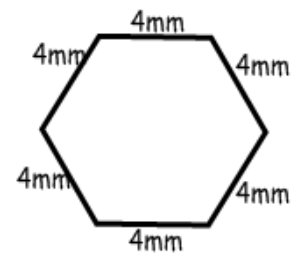
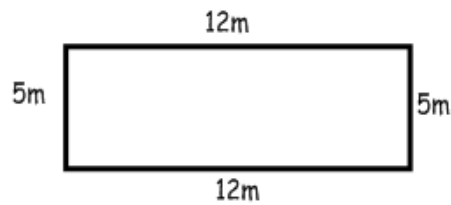
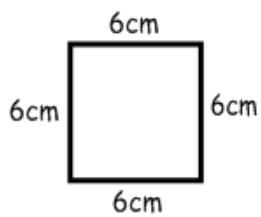
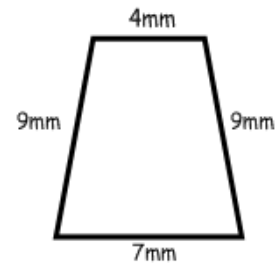
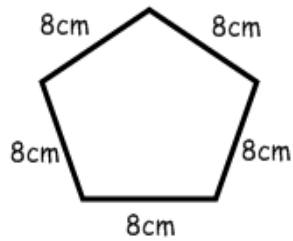
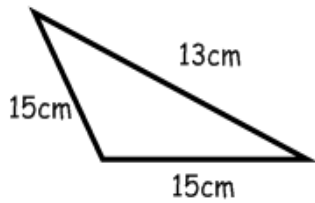
- a) 5000 m b) 90000 m c) 1200 m d) 700 m
e) 650 m f) 850 m g) 80 m h) 40 m

5. Which is **longer** :

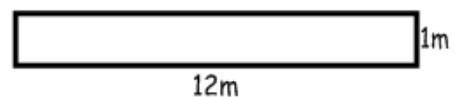
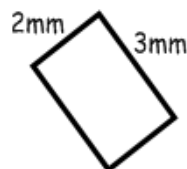
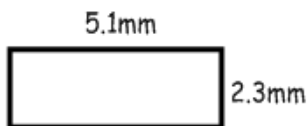
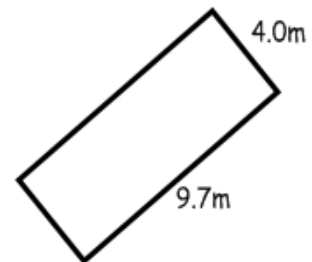
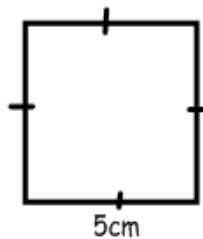
- a) $\frac{1}{2}$ km or 510 m ? b) 26 mm or $2\frac{1}{2}$ cm ?
c) 0.7 km or 75 m ? d) $\frac{1}{4}$ m or 235 cm ?

23. Calculating Perimeter and Area (MNU 2-11c)

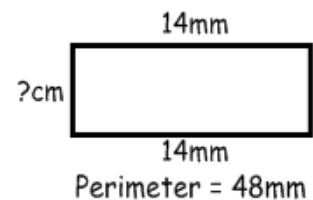
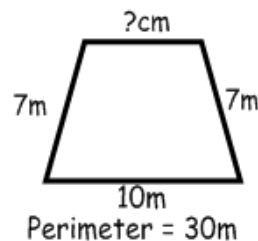
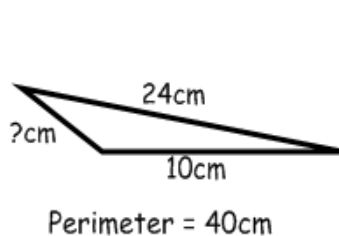
1. Calculate the perimeter of the following shapes



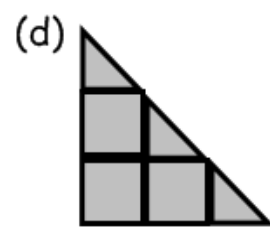
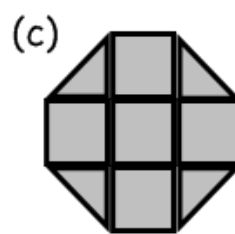
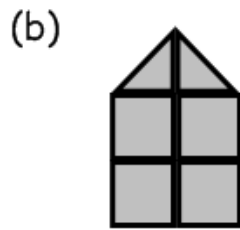
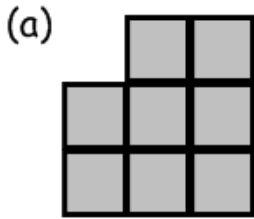
2. Calculate the perimeter of these rectangles



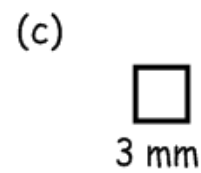
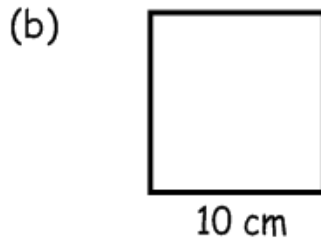
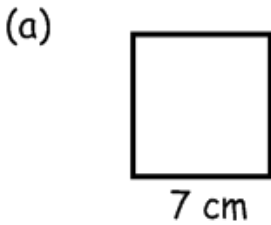
3. Calculate the missing lengths in the following shapes



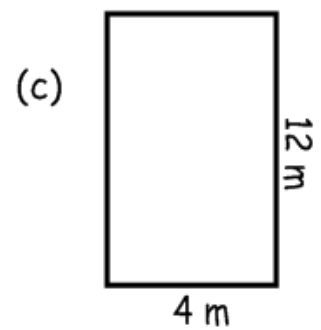
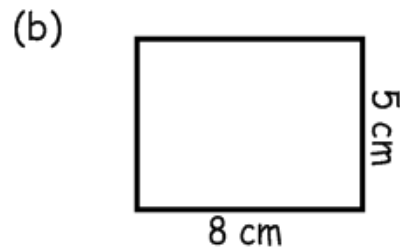
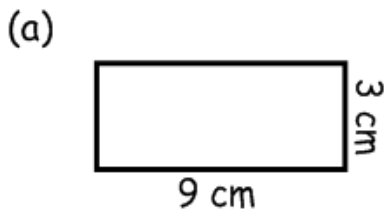
4. The following shapes are made up of 1 centimetre squares placed next to each other. Write their area in cm^2 :-



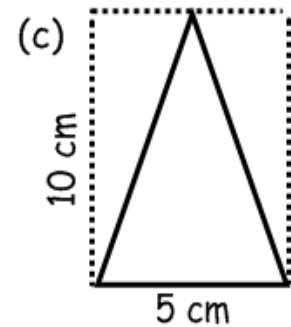
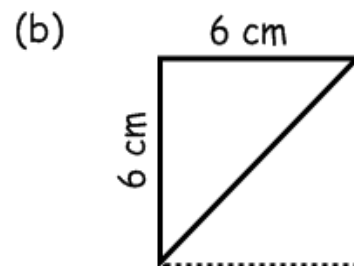
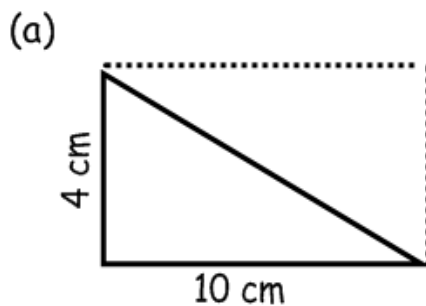
5. Calculate the area of each square:



6. Calculate the area of each rectangle:



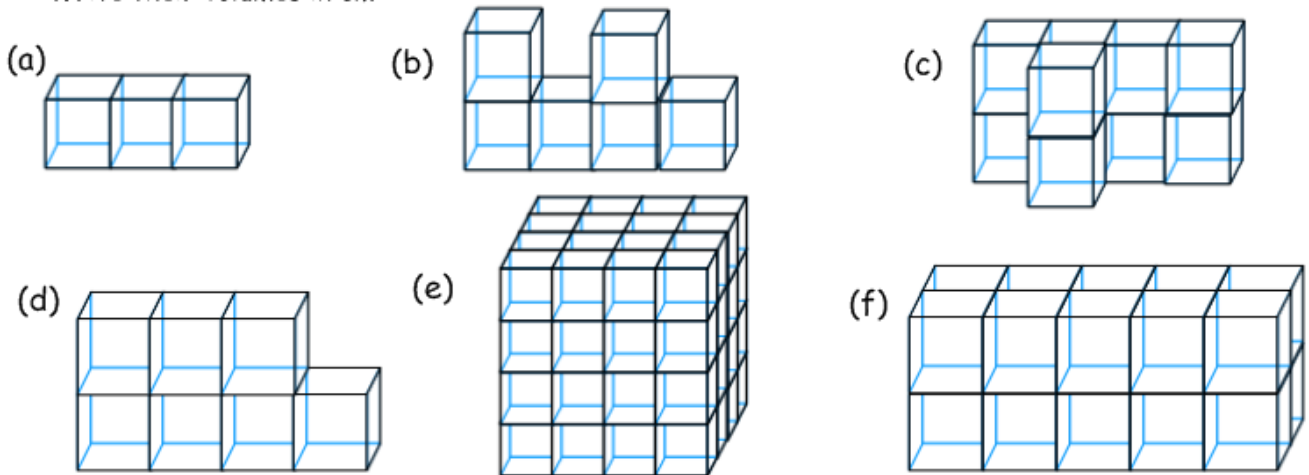
7. Calculate the area of each rectangle:



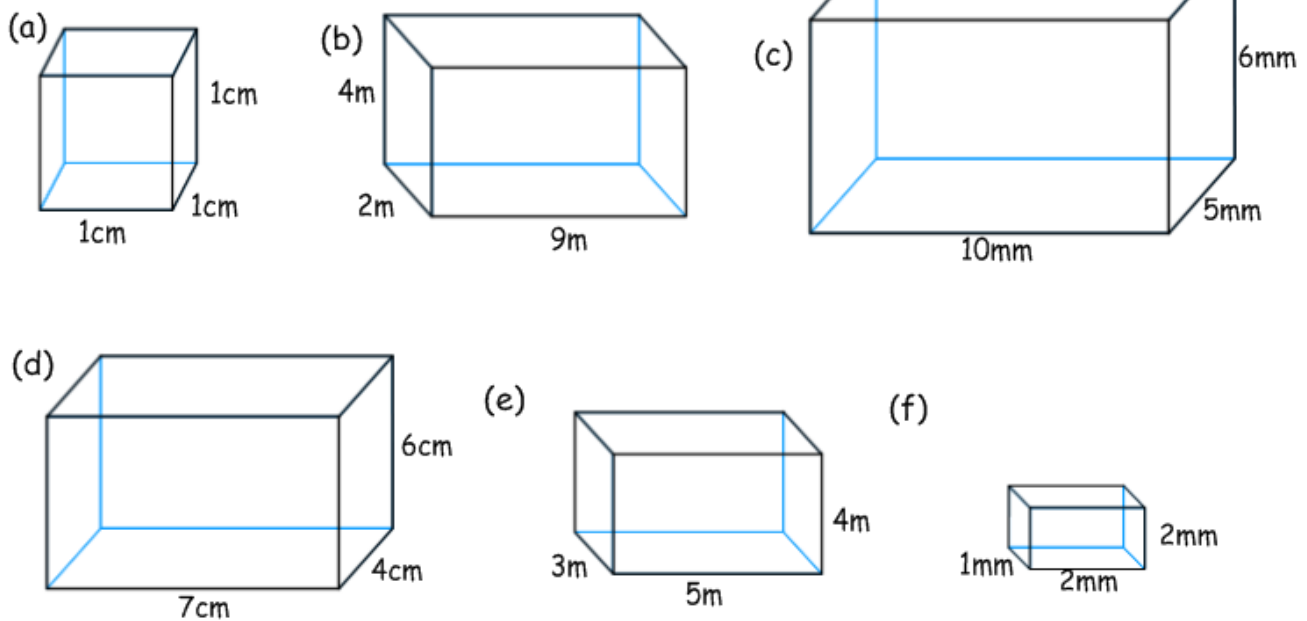
- (d) How could we find the area of each triangle?

24. Calculating Volume (MNU 2-11c)

1. The following shapes are made up of 1 centimetre cubes placed next to each other.
Write their volumes in cm^3 :-



2. Calculate the volume of each cube or cuboid below.
Write their volumes in cm^3 :-



25. Impact of Mathematics in the World (MTH 2-12a)

In pairs you must research the impact and importance of mathematics in the modern world.

Choose an area of life i.e. transport, construction, electronics, etc. Prepare a presentation on how mathematics is essential to this part of everyday life. You should be clear in your explanations of what mathematics are involved.



26. Simple Linear Patterns (MTH 2-13a)

1. Here is a pattern of bees and their wings.



1 bee
2 wings



2 bees
? wings



3 bees
? wings

a) Draw the next pattern using 4 bees.

b) Copy and complete the table below

| | | | | | | |
|-----------------|---|---|---|---|---|---|
| No of bees (B) | 1 | 2 | 3 | 4 | 5 | 6 |
| No of wings (W) | 2 | | | | | |

c) For every extra bee how many extra wings are there?

d) Copy and complete :- the total no of wings = ? x the no of bees

e) Write the formula from c) using symbols $W = ? \times B$

f) Using the formula from e) decide how many wings there would be if there was 10 bees.

2. Here is a pattern of octopuses and their arms.



1 spider
8 legs



2 spiders
? legs



3 spiders
? legs

a) Draw the next pattern using 4 spiders.

b) Copy and complete the table below

| | | | | | | |
|-------------------|---|---|---|---|---|---|
| No of spiders (S) | 1 | 2 | 3 | 4 | 5 | 6 |
| No of legs (L) | 8 | | | | | |


c) For every extra spider how many extra legs are there?


d) Copy and complete :- the total no of legs = ? x the no of spiders


e) Write the formula from c) using symbols $L = ? \times S$

f) Using the formula from e) decide how many legs there would be if there was 10 spiders.

3. For each of the tables, determine a formula connecting the two letters.

| | | | | | | | | |
|---------------------|---|----|----|---|---|---|---|------------------|
| No of starfish (S) | 1 | 2 | 3 | 4 | 5 | 6 |  | $T = ? \times S$ |
| No of tentacles (T) | 5 | 10 | 15 | | | | | |

| | | | | | | | | |
|--------------------|---|---|----|---|---|---|---|------------------|
| No of tortoise (T) | 1 | 2 | 3 | 4 | 5 | 6 |  | $L = ? \times T$ |
| No of legs (L) | 4 | 8 | 12 | | | | | |

| | | | | | | | | |
|----------------|---|----|----|---|---|---|---|------------------|
| No of ants (A) | 1 | 2 | 3 | 4 | 5 | 6 |  | $L = ? \times A$ |
| No of legs (L) | 6 | 12 | 18 | | | | | |

27. Solving Simple Equations (MTH 2-15a)

1. Find the missing number in each example:

a) $\square + 1 = 7$

b) $\square - 5 = 3$

c) $9 + \square = 10$

d) $12 - \square = 6$

e) $25 - \square = 5$

f) $\square - 19 = 11$

g) $\square \times 2 = 14$

h) $3 \times \square = 15$

i) $40 \div \square = 20$

j) $\square \div 3 = 4$

k) $\square \times 9 = 99$

l) $\square \div 12 = 3$

2. Find the value of x in each example:

a) $x + 3 = 9$

b) $x - 2 = 13$

c) $7 + x = 10$

d) $25 - x = 18$

e) $17 - x = 7$

f) $x - 30 = 30$

g) $x + 2 = 8$

h) $24 + x = 35$

3. Find the value of x in each example:

a) $4x = 16$

b) $6x = 18$

c) $9x = 27$

d) $7x = 49$

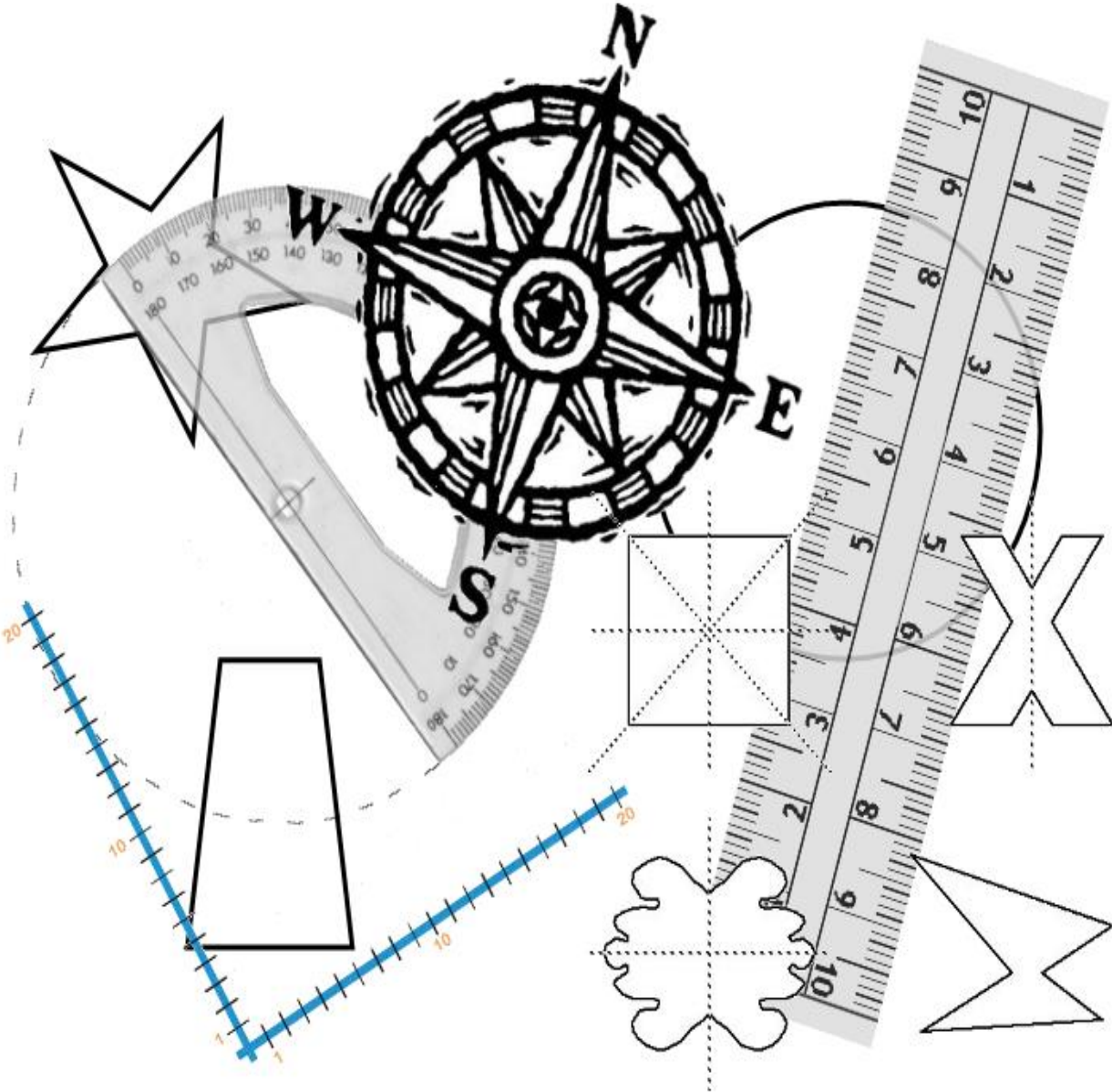
e) $10x = 170$

f) $6x = 66$

g) $8x = 32$

h) $3x = 39$

Level 2: Shape, Position and Movement



Level 2: Shape, Position and Movement

Contents

28. 2D Shape Properties (MTH 2-16a)
29. 3D Shape Properties (MTH 2-16a)
30. Nets of 3D Shapes (MTH 2-16b)
31. Drawing 2D Shapes (MTH 2-16c)
32. Drawing 3D Shapes (MTH 2-16c)
33. Types of angles (MTH 2-17a)
34. Measuring Angles (MTH 2-17b)
35. Drawing Angles (MTH 2-17b)
36. Compass Points (MTH 2-17c)
37. 3- Figure Bearings (MTH 2-17c)
38. Using Scales (MTH 2-17d)
39. Scale Drawings (MTH 2-17d)
40. Coordinates (MTH 2-18a)
41. Line Symmetry (MTH 2-19a)

28. 2D Shape Properties (MTH 2-16a)

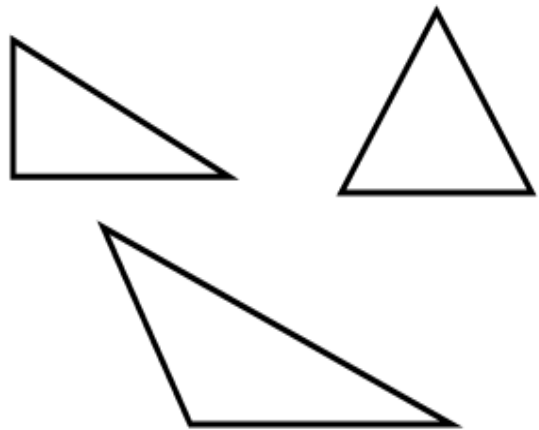
1. List the properties of a square.



2. List the properties of a rectangle.

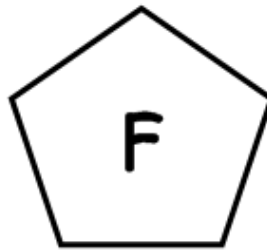
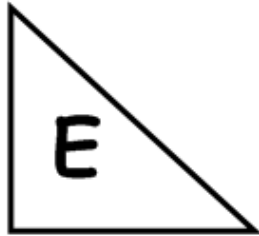
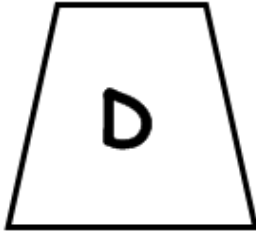


3. List the properties of a triangle.



4. Now you must think of places you see these shapes in every day life. Write a list of places you regularly see these shapes.

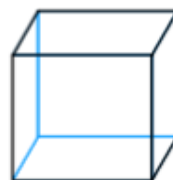
5. Name the various 2-Dimensional shapes underneath:



6. List the properties of each shape above.

29. 3D Shape Properties (MTH 2-16a)

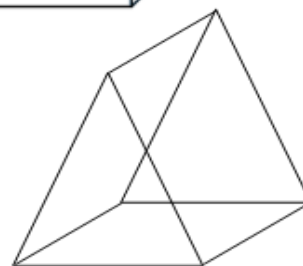
1. List the properties of a **cube**.



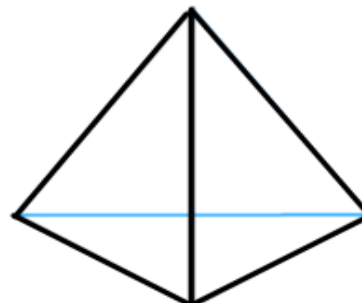
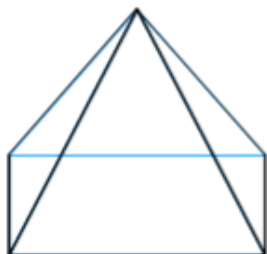
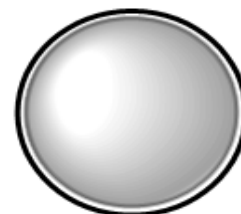
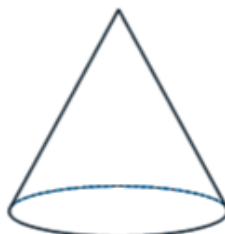
2. List the properties of a **cuboid**.



3. List the properties of a **triangular prism**.

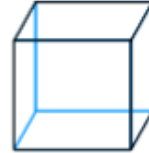


4. Name the following 3-dimensional shapes and list their properties:

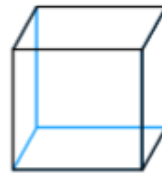


30. Nets of 3D Shapes (MTH 2-16b)

1. Sketch 3 possible nets for a cube.

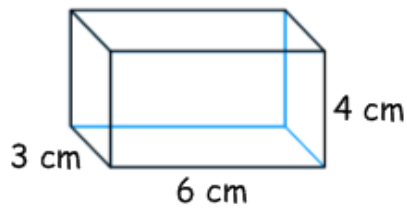


2. Draw the net of this cube:

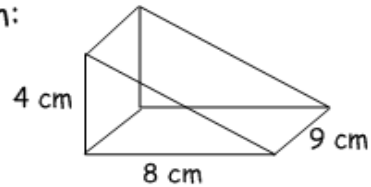


4 cm

3. Draw the net of this cuboid:

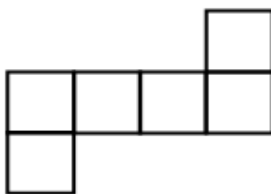


4. Draw the net of this triangular prism:

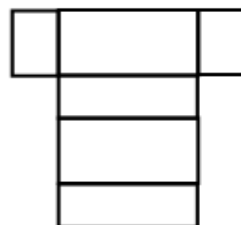


5. Name the shape each net forms:

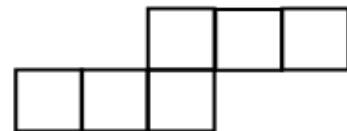
(a)



(b)



(c)



31. Drawing 2D Shapes (MTH 2-16c)

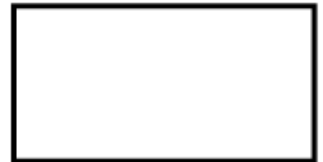
1. Draw a **square** with dimensions:

- a) length = 3 cm b) length = 5 cm c) length = 10 cm

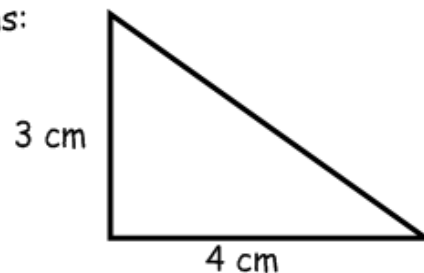


2. Draw a **rectangle** with dimensions:

- a) length = 5 cm b) length = 6 cm c) length = 8 cm
breadth = 2 cm breadth = 1 cm breadth = 4 cm



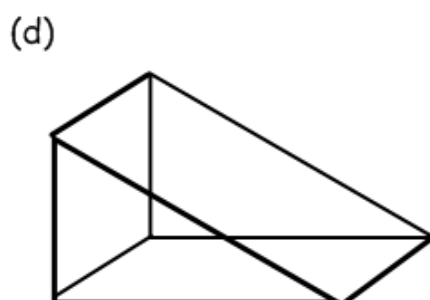
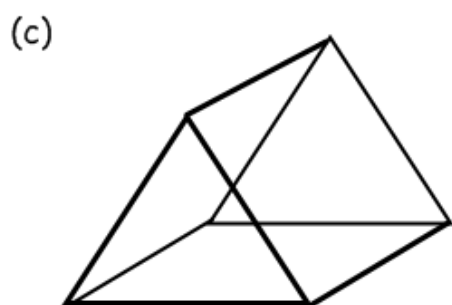
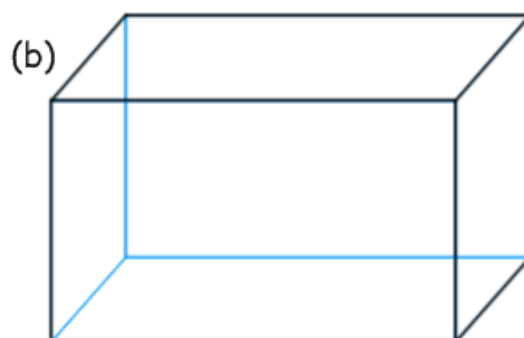
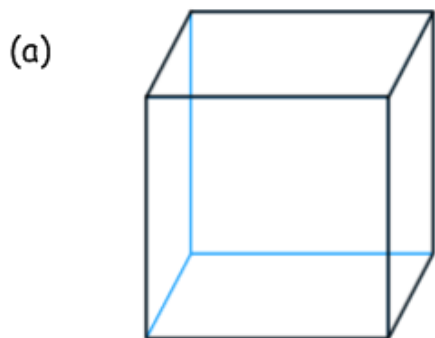
3. Draw this **triangle** with dimensions:



Measure the length of the missing side.

32. Drawing 3D Shapes (MTH 2-16c)

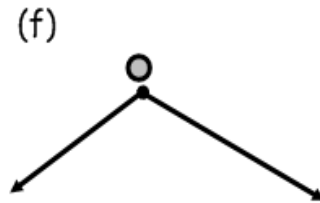
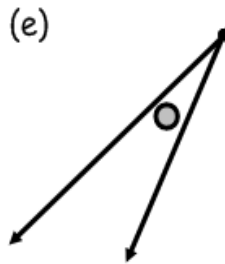
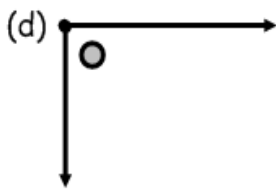
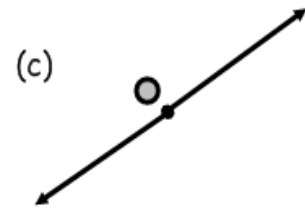
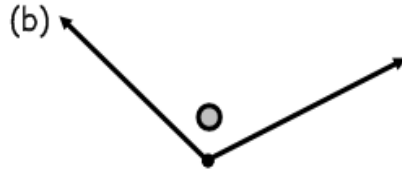
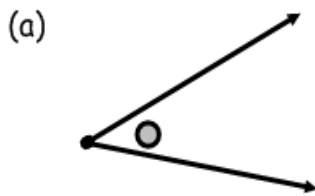
Sketch the following three-dimensional shapes:



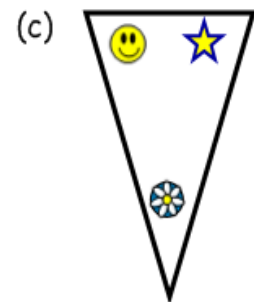
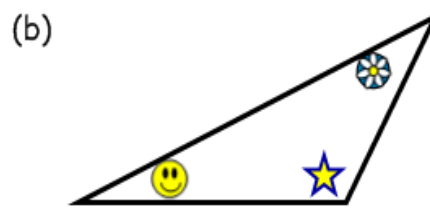
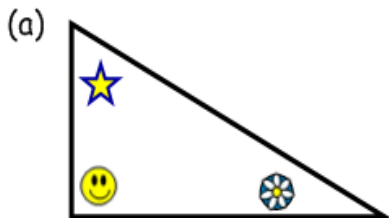
33. Types of angles (MTH 2-17a)

1. List all types of angles and state the size or range of sizes they are.

2. State which type of angle each of the following is:



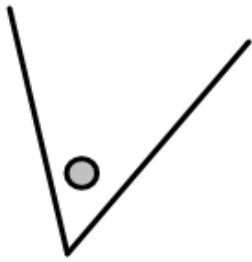
3. State the types of angles present in each triangle:



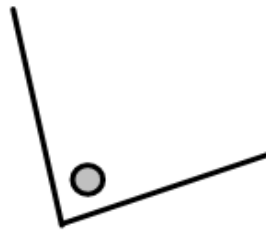
34. Measuring Angles (MTH 2-17b)

1. Measure each angle:

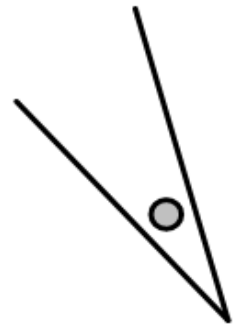
(a)



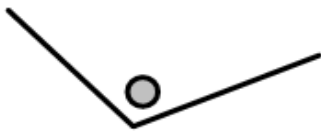
(b)



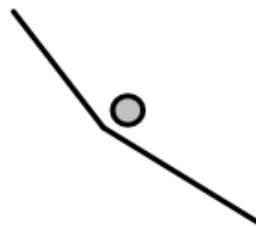
(c)



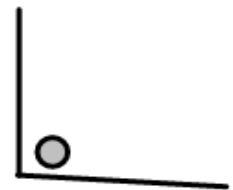
(d)



(e)

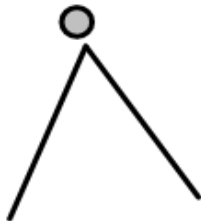


(f)

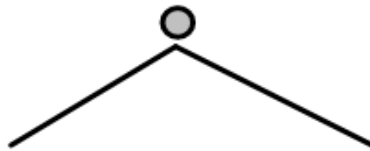


2. How could we measure the size of each angle below?
Find the size of each angle.

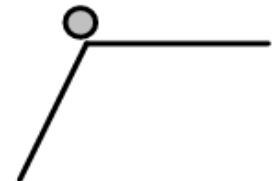
(a)



(b)



(c)



35. Drawing Angles (MTH 2-17b)

1. Draw each of the following angles:

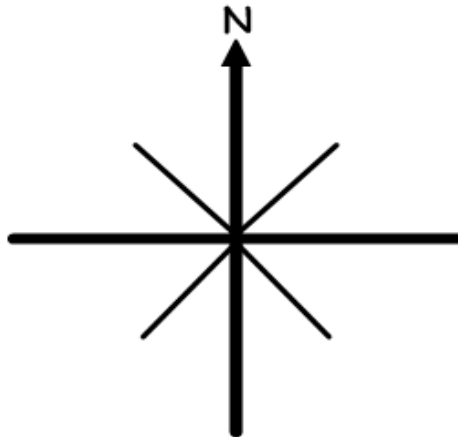
- | | | |
|----------------|-----------------|-----------------|
| (a) 25° | (b) 70° | (c) 49° |
| (d) 92° | (e) 135° | (f) 162° |

2. Find a method for drawing the angles below:

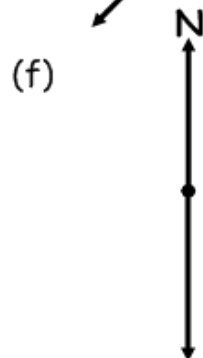
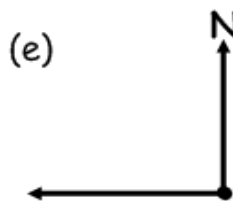
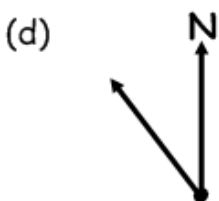
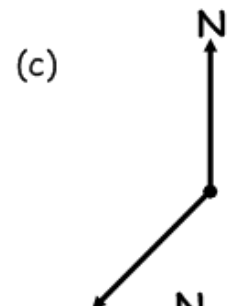
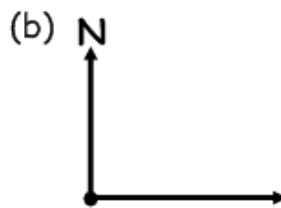
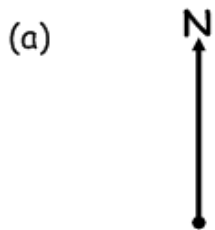
- | | | |
|-----------------|-----------------|-----------------|
| (a) 190° | (b) 244° | (c) 300° |
| (d) 355° | (e) 5° | (f) 178° |

36. Compass Points (MTH 2-17c)

1. Fill in the correct compass points on the diagram below:



2. State the direction each of the following arrows are pointing to:



Now try

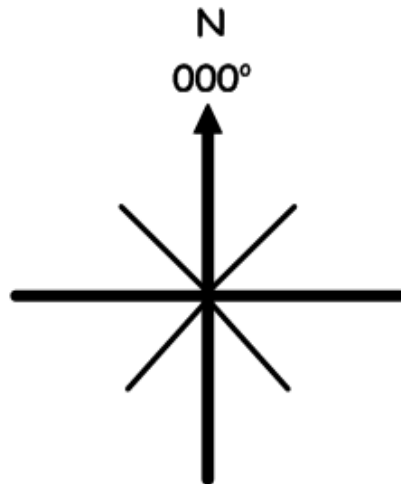


Compass Points!

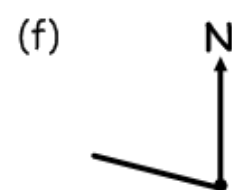
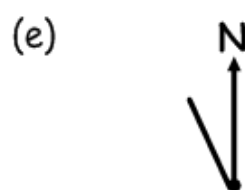
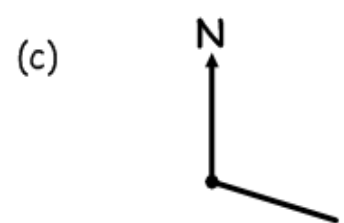
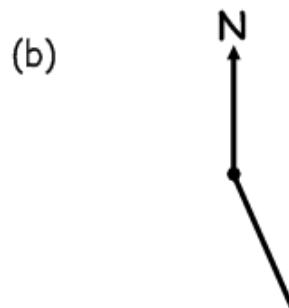
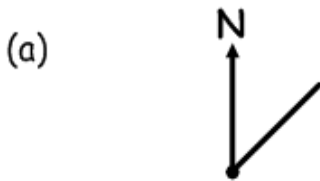


37. 3- Figure Bearings (MTH 2-17c)

1. Fill in the correct 3-Figure Bearings on the diagram below:



2. Measure the bearing of each of the following:



38. Using Scales (MTH 2-17d)

1. Using a scale of **1 centimetre \equiv 50 metres**, convert the following to their real life size:
- (a) Mount Everest: 200 cm (b) Taj Mahal: 4 cm
2. Using a scale of **1 centimetre \equiv 25 metres**, convert the following to their scaled down size:
- (a) Roman Colosseum: 50 metres (b) CN Tower: 550 metres
3. On a map, the distance between New York and Los Angeles is 9 cm. The map uses a scale of **1 centimetre represents 500 miles**. Calculate the actual distance between New York and Los Angeles.



4. A model of the Eiffel Tower is 15 centimetres tall. The model is to scale and every **1 centimetre \equiv 20 metres**. Calculate the real height of the Eiffel Tower.



5. Edward is preparing a science project. He is making a model of an active volcano. The real life volcano is 220 metres tall. He wants to use a scale of **5 centimetres \equiv 10 metres**. How tall must his model be?



6. Peter and his Grandfather are building a scaled model of a World War 2 Spitfire. In reality, the Spitfire had a wingspan of 36 feet. Their model has a wingspan of 72 centimetres. What scale must they be using?



39. Scale Drawings (MTH 2-17d)

1. A rectangular garden measures 15 metres by 9 metres.
Make a scale drawing of the garden where **1 centimetre represents 3 metres**.
2. El Plaza Mayor in Madrid is rectangular and measures 250 metres by 200 metres.
Make a scale drawing of the garden where **2 centimetres represents 50 metres**.



3. The Empire State building in New York has a height of approximately 400 metres and the width of its base is approximately 120 metres.
Make a scale drawing of the garden where **1 centimetre represents 40 metres**.



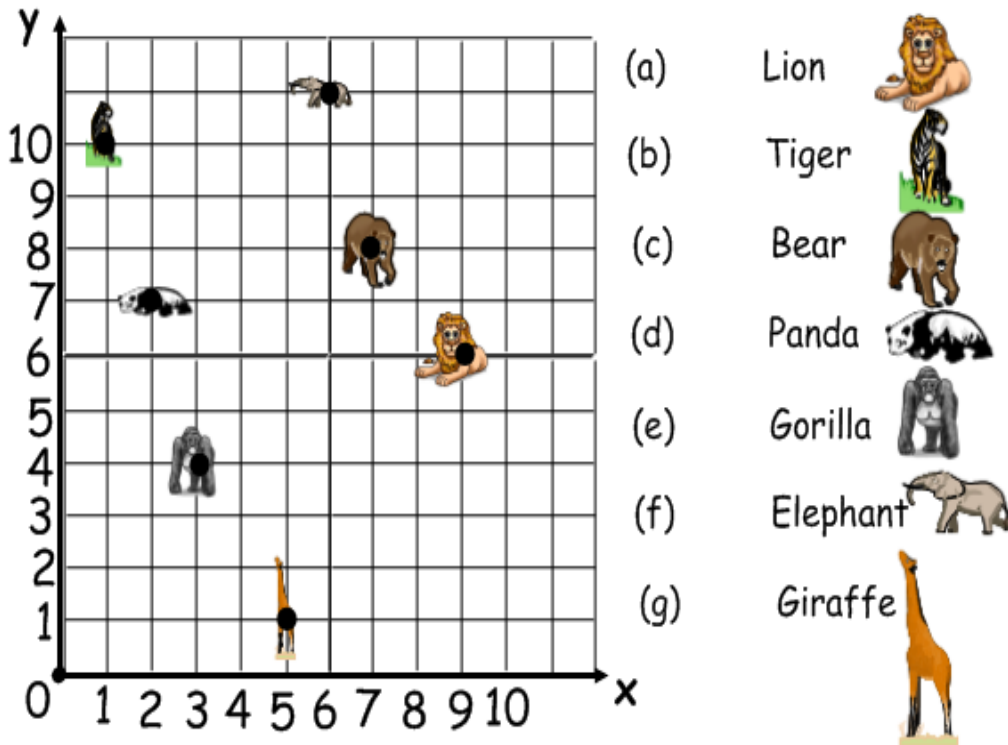
Now try



Skyscrapers to scale!

40. Coordinates (MTH 2-18a)

1. Use the grid of this zoo to identify the co-ordinates each of the animals lie on:



2. Draw your own coordinate grid with values of x between 0 and 10 and values of y between 0 and 10.

Now plot the following points on the grid:

A(1, 7); B(5, 3); C(2, 2); D(0, 10); E(9, 1); F(6, 8); G(4, 0).



Now try

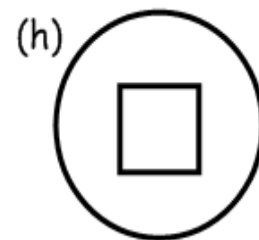
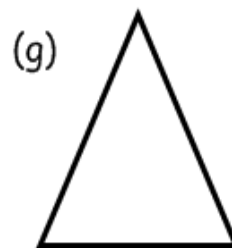
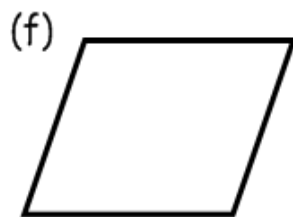
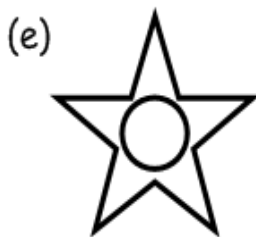
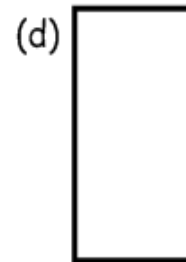
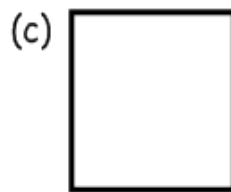
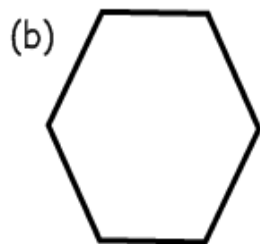
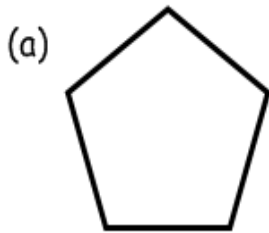
STAR WARS

Coordinates!

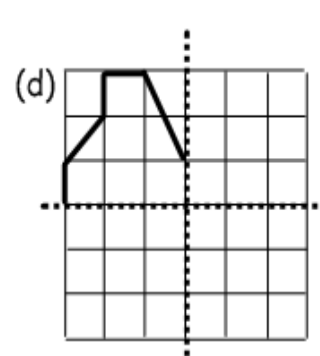
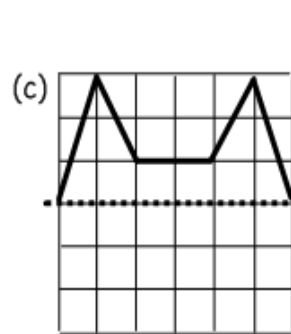
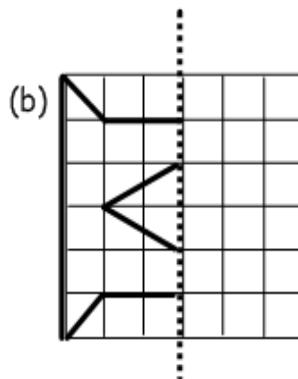
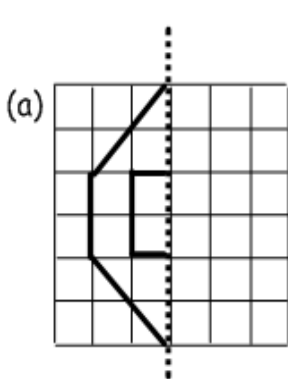


41. Line Symmetry (MTH 2-19a)

1. Copy the following shapes and draw in **ALL** lines of symmetry:



2. Use the line of symmetry to complete each shape:



Level 2: Information Handling



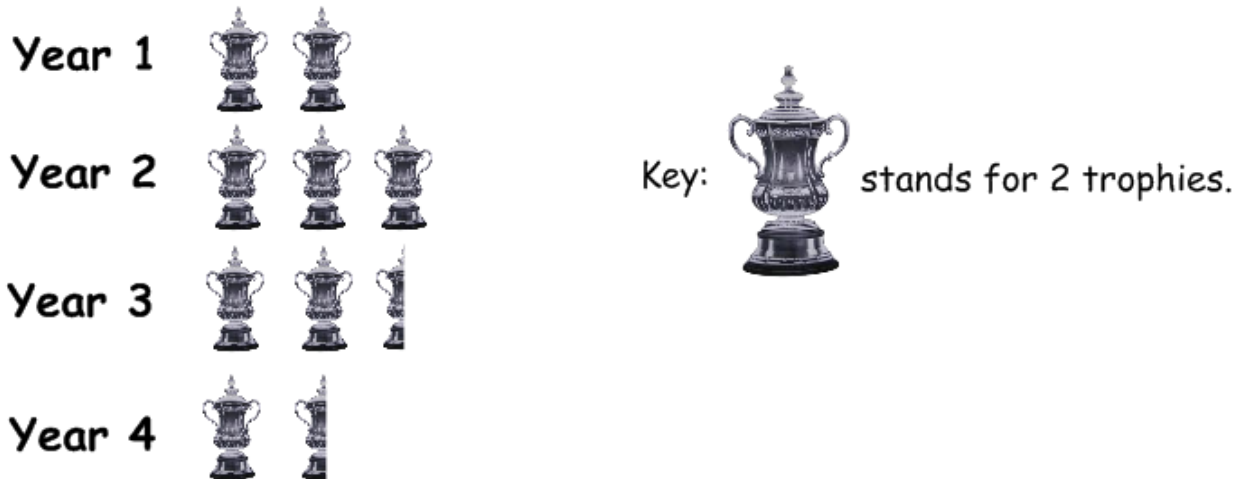
Level 2: Information Handling

Contents

42. Interpret Data (MNU 2-20a)
43. Misleading Statistics (MNU 2-20a)
44. Displaying data with an appropriate scale (MNU 2-21a)
45. Statistical Investigations (MTH 2-20b)
46. Probability Investigation (MNU 2-22a)

42. Interpret Data (MNU 2-20a)

1. The pictograph shows the total number of trophies won by each of the school football teams over the last 4 years:

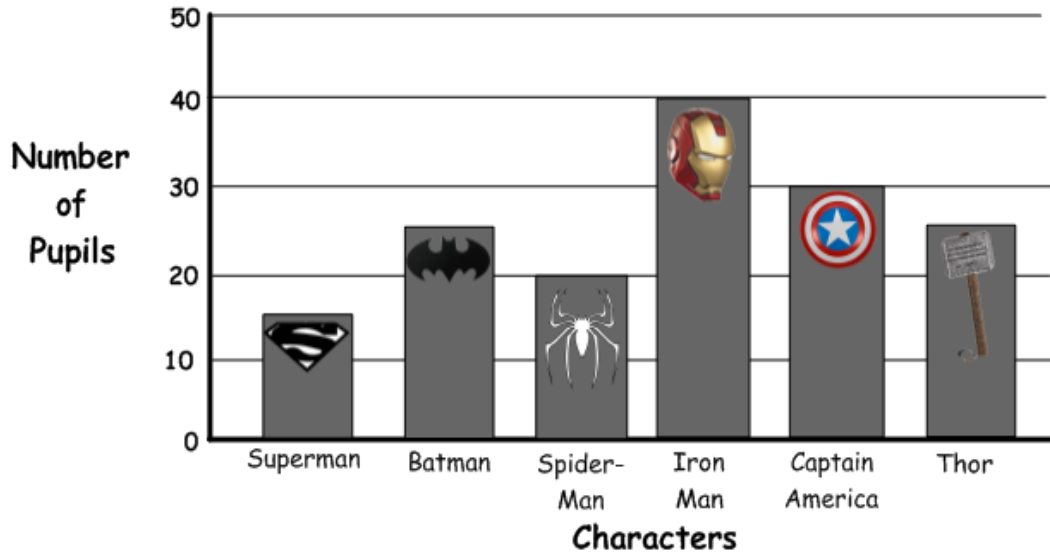


- (a) How many trophies were won in each year?
(b) How many trophies were won altogether in the last 4 years?
2. The pictograph shows the number of chocolate bars bought from the local shop each lunchtime during the past 5 days:



- (a) How many bars were bought in each day?
(b) How many bars were bought altogether in the last 5 days?

3. The bar graph shows the popularity of various comic book characters among school pupils:



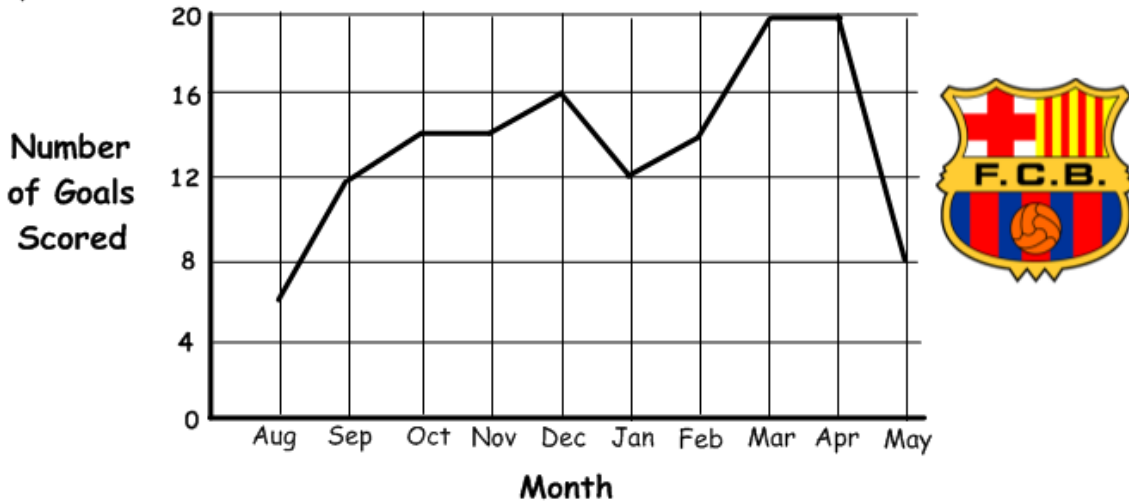
- (a) How many pupils liked each character?
- (b) How many pupils were asked altogether?
- (c) How many more pupils preferred Batman to Superman?
- (d) Give a reason for the popularity of certain characters over others?

4. The bar graph shows the popularity of various ice cream flavours amongst customers in a cafe:



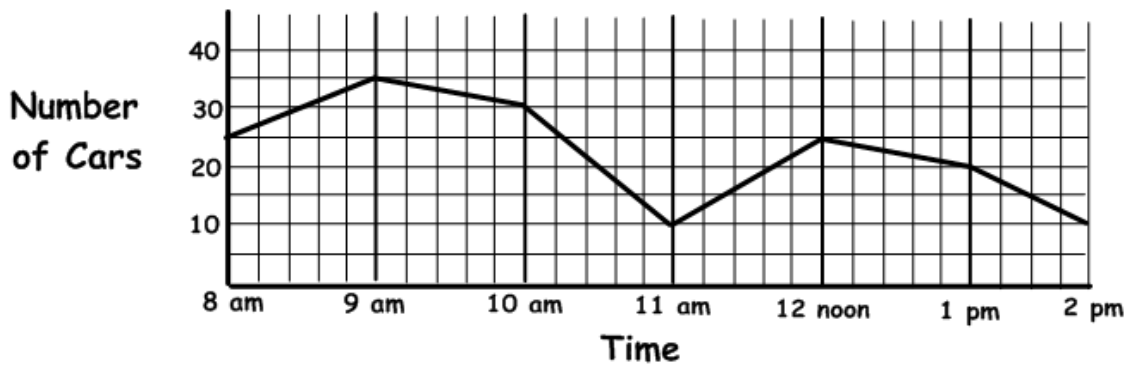
- (a) How many customers liked each flavour?
- (b) How many customers were surveyed altogether?
- (c) How many more customers preferred Strawberry to Toffee?
- (d) Do you agree with the findings of the survey?

5. The line graph shows the number of goals FC Barcelona scored in each month of the season last year:



- (a) How many goals did they score in each month?
- (b) Over which two months did they score most goals?
- (c) How many goals did they score all season?

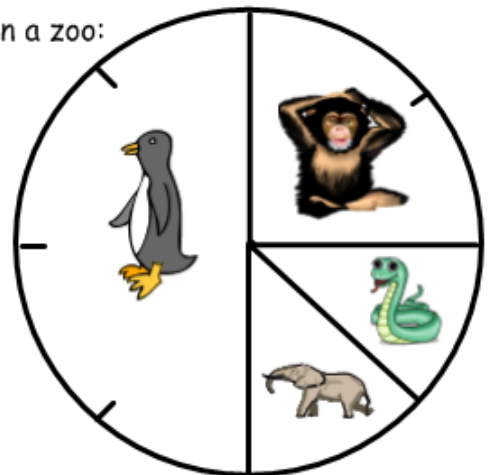
6. The line graph shows the number of cars passing through a residential street at various times on a particular day:



- (a) How many cars passed through the street each hour?
- (b) How many cars passed through the street altogether?
- (c) Describe the trends in the line graph and give your opinion on why the graph rises and falls at different times.

7. The pie chart shows the popularity of different animals in a zoo:

- (a) What fraction of people liked each animal?
- (b) What percentage of people liked each animal?
128 people were surveyed.
- (c) How many liked each animal?



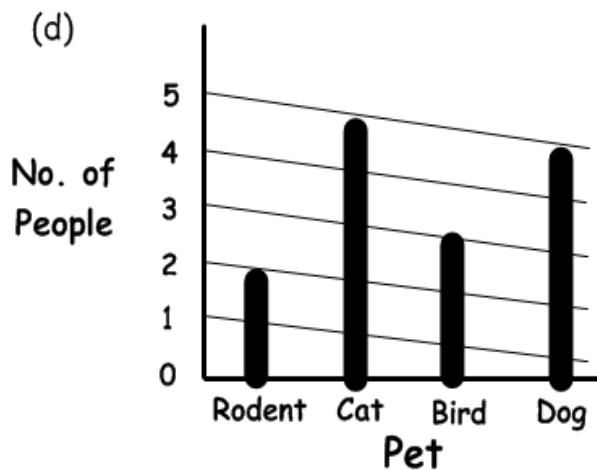
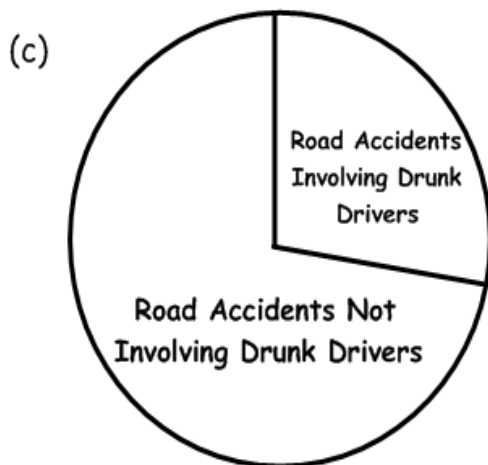
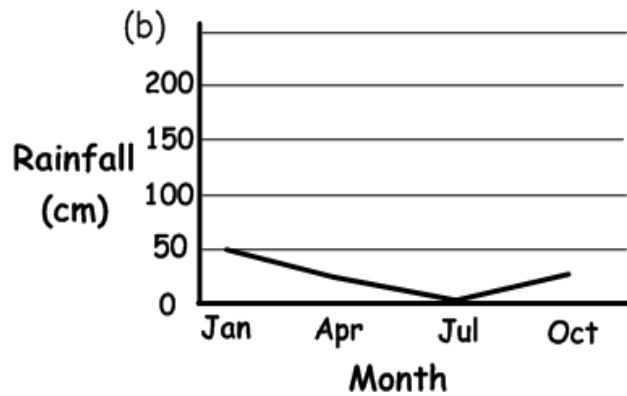
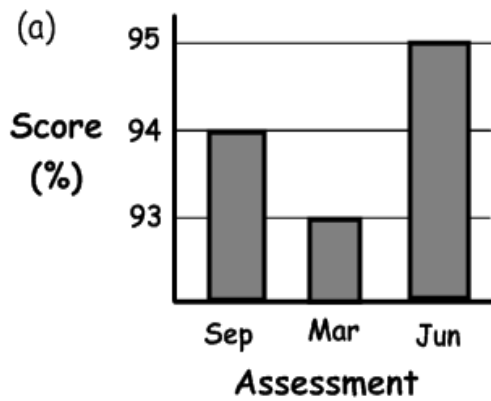
8. The pie chart shows the popularity of seasons from a survey of 250 people:



- (a) What fraction of people liked each season?
- (b) What percentage of people liked each season?
- (c) How many people preferred each season?

43. Misleading Statistics (MNU 2-20a)

1. For each of the following data displays, state what makes them misleading:



2. For homework, look through newspapers, magazines, the Internet, etc. to find misleading statistics from the real world.

Present these misleading statistics in a collage.

44. Displaying data with an appropriate scale (MNU 2-21a)

1. Pupils were asked what their favourite series of books were, what each pupil preferred is shown below:



- Collect this information in a frequency table.
- Display this information in a bar graph.
- Display this information in a pictograph.
- Write a conclusion on the data you have collected and displayed.

It should include how many pupils were asked, what was most popular and what was least popular. Also, you should think of reasons why certain books were more popular than others.

2. A number of school pupils in Edinburgh were asked what their favourite sport was.
The results are shown below:



- Collect this information in a frequency table.
- Display this information in a bar graph.
- Display this information in a pictograph.
- Write a conclusion on the data you have collected and displayed.

It should include how many pupils were asked, what was most popular and what was least popular. Also, you should think of reasons why certain sports were more popular than others.

3. The number of bumblebees spotted in a certain area of Glasgow is recorded each month:

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Number of Bees | 0 | 1 | 4 | 8 | 22 | 35 | 34 | 42 | 20 | 6 | 0 | 0 |



- (a) Display this information in a line graph.
- (b) Write a conclusion on the data you have displayed.
Give reasons for the trends you see in the line graph.

4. The temperature each day of a particular week during the month of June is recorded:

| Day | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
|------------------|-----|-----|-----|-----|-----|-----|-----|
| Temperature (°C) | 20 | 21 | 23 | 23 | 22 | 26 | 28 |

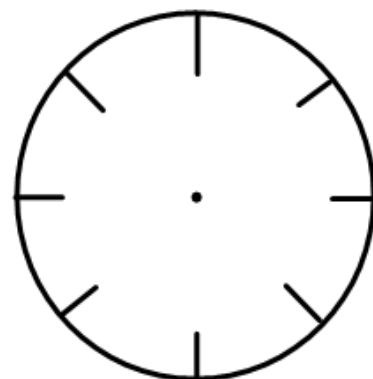


- (a) Display this information in a line graph.
- (b) Describe the change in weather during that particular week.

5. S1 pupils were asked to name their favourite subject at school.
The results are shown in the table:

| <u>Subject</u> | <u>Percentage of Pupils</u> |
|----------------|-----------------------------|
| English | 25% |
| Maths | 50% |
| Science | 12.5% |
| Socials | 12.5% |

Display this information in a Pie Chart using this template:



Now try



Statistics!



45. Statistical Investigations (MTH 2-20b)

1. Choose something you are very interested in.
(e.g. Sport, Music, Film, Television, Gardening, Knitting, etc.)
2. Think of a question you would like to find the answer to about your chosen topic.
(e.g. Who is the best footballer in the world just now?)
3. Think of a relevant group to ask this question to.
(e.g. girls, boys, men, women, elderly people, etc.)
4. Decide how many people from your chosen group of people you would have to ask to find a conclusive answer to your question.
(e.g. 25, 50, 100, 200, etc.)
5. Create a plan for collecting this data and give yourself a realistic time scale to complete the task in.
6. Now you must carry out your survey, collect the relevant data, display your findings graphically and report back to your class on your findings.



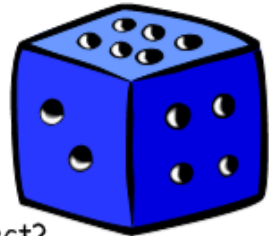
46. Probability Investigation (MNU 2-22a)

(Before you attempt this lesson you must have di, coins and playing cards)

1. (a) How many faces does the coin have?
(b) Describe the chances of the coin landing on heads.
(c) Flip the coin until it lands on heads. Was your theory correct?



2. (a) How many faces are on a dice?
(b) Describe the chances of rolling a 6 on the dice.
(c) Roll the dice until you get a 6. Was your theory correct?
(d) Describe the chances of rolling an odd number on the dice.
(e) Roll the dice until you get an odd number. Was your theory correct?



3. (a) How many cards are in a pack?
(b) Describe the chances of choosing an ace at random from a shuffled pack.
(c) Test your theory by drawing cards from a shuffled pack. Was your theory correct?

