

Name ..... Class ..... Date .....

- 1 Shelley is doing a survey to find out how many people eat five portions of fruit or vegetables every day.  
She decides to ask 10 people as they come out of a local gym.  
Give two different reasons why Shelley's method might not give very good data.
- 2 Asmat conducted a survey about how accurately people could guess the length of a piece of string to the nearest centimetre.  
The results of the survey are given in the stem-and-leaf diagram.

2	7	9
3	3	5 5 6 8 9 9 9
4	0	1 1 1 3 4 6 6 7 8 9 9 9
5	0	0 1 2 3 3 5 7 8
6	2	4 9

- a How many people took part in Asmat's survey?
  - b Find the median length guessed.
  - c Find the range of lengths guessed.
  - d The actual length of the string was 44 cm. What percentage of the people surveyed were more than 10 cm out on their guess? Give your answer to one decimal place.
- 3 The annual salaries of the workers in a factory are:
 

20 apprentices	£8500 each
15 semi-skilled workers	£15 000 each
10 skilled workers	£18 500 each
2 foremen	£23 000 each
1 manager	£37 000

The workers were discussing the average earnings in the factory.

    - a The union representative quoted the modal salary as the average.  
What is the modal salary?
    - b One of the foremen quoted the median as the average.  
What is the median?
    - c Calculate the mean salary of all the people who work in the factory.
    - d Why is there a large difference between the modal and mean salaries?
  - 4 Twenty people were asked their age and the number of hours of sleep they felt they needed.

The results are shown in the table.

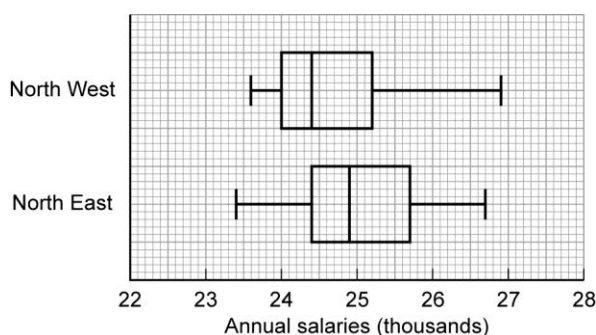
<b>Age</b>	11	17	20	28	27	25	17	19	24	19
<b>No. of hours sleep</b>	10.5	9	8.5	6	5	6.5	8.5	8	6	7.5

<b>Age</b>	21	16	20	29	22	16	23	15	22	25
<b>No. of hours sleep</b>	7	10.5	8	5.5	7.5	9.5	7	10	6.5	10

Name ..... Class ..... Date .....

- a Plot this information on a scatter graph and draw the line of best fit.
  - b Use your line of best fit to estimate how many hours sleep a person of 26 years of age would need.
  - c Comment on the relationship between age and the number of hours of sleep needed.
- 5** James is an unemployed engineer.  
He is planning to move to the North East, North West or West Midlands region of the UK to find work.

He downloads from the internet details of 25 vacancies for engineers in each region.  
A summary of the salaries in the North East and North West regions is illustrated in the box plots below.



- a What is the range of salaries in the North West?
- b Find the inter-quartile range of salaries in the North West region.
- c James summarises his results from the West Midlands region.

The median salary is £25 500, the lower quartile salary is £23 800 and the inter-quartile range is £2900.

The highest salary is £27 200 and the lowest £22 600.

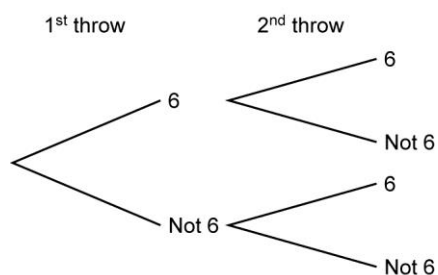
Use these results to draw a box plot for the West Midlands salaries, using the same scale for the horizontal axis as used on the diagram above.

- d Comment on the salaries for engineers in the three regions that James is looking at.

Name ..... Class ..... Date .....

- 6 Katie has a biased dice. The probability of throwing a six with the dice is 0.4.  
Katie throws the dice twice.

a Copy and complete the following probability tree diagram.



- b What is the probability that Katie does not throw a six in her two throws?  
c What is the probability that Katie throws exactly one six in her two throws?
- 7 Ewan wants to find out the length of time cars are left in a car park.  
His results, to the nearest minute, are given in the table

Length of stay (minutes)	Number of cars (frequency)	Cumulative frequency
$0 < t \leq 15$	0	
$15 < t \leq 30$	21	
$30 < t \leq 45$	36	
$45 < t \leq 60$	42	
$60 < t \leq 75$	62	
$75 < t \leq 90$	22	
$90 < t \leq 120$	11	
$120 < t \leq 135$	6	

- a Copy and complete the table.  
b Draw a cumulative frequency diagram for the data.  
c Use your diagram to estimate the inter-quartile range.  
d The owners of the car park think that about two-thirds of the cars are parked for between 40 and 80 minutes.  
Do Ewan's results support this?  
Give a reason for your answer.
- 8 A bag contains 4 red balls, 5 blue balls and 3 yellow balls.  
One ball is selected at random and **not** replaced. A second ball is then selected at random.
- a Calculate the probability that both balls are blue.  
b Calculate the probability that the two balls are different colours.  
Show your method.

Name ..... Class ..... Date .....

**9** The two-way table shows the number of males and females in a school.

	<b>Staff</b>	<b>Students</b>
<b>Male</b>	57	509
<b>Female</b>	42	592

The headteacher conducts a survey to find the reaction of the school to the introduction of a new uniform.

He decides to ask 200 people in total using stratified sampling.

How many of the sample will be:

**a** male staff      **b** female staff      **c** male students      **d** female students?

**10** A farmer weighs all 55 eggs collected one day.

The results are shown in the grouped frequency table below.

<b>Weight, <math>x</math> grams</b>	<b>Number of eggs, <math>f</math></b>	<b>Frequency density</b>
$30 \leq x < 50$	5	
$50 \leq x < 60$	15	
$60 \leq x < 90$	30	
$90 \leq x < 110$	10	

**a** Copy the table and complete the frequency density column.

**b** Draw a histogram for the data.

**c** Estimate the mean weight of the eggs collected on that day.