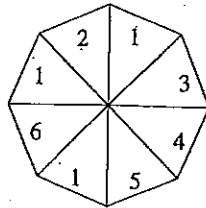


# Chance & Data

## A Chance and data: Displaying sample spaces

Use a lattice diagram to display the sample space of:

- Tossing a fair coin and rolling a die with numbers 7 → 12.
- Spinning this spinner twice.



## B Chance and data: Probability of multiple independent events

A box contains 6 red and 7 blue balls. The balls is selected and its colour noted. It is then replaced and another taken out. What is the probability of selecting:

- two red balls
- two blue balls
- red then blue in that order
- red and blue or blue and red?

## C Chance and data: Probability of multiple dependent events

A box contains 6 red balls and 5 blue balls. A ball is selected, its colour noted and then another selected. What is the probability of selecting:

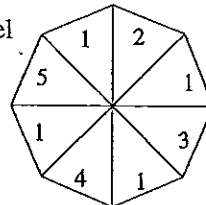
- two red balls
- two blue balls
- red then blue in that order
- a red then blue or blue then red?

## D Chance and data: Probability and gambling odds

- Express the bookies odds on the following horses as probabilities (numbers between 0 and 1):  
Blue Boy 3:1, Alex's Girl 1:1, Alice's Girl 4:1, Katie's Cauldron 6:1, Ben's Blitz 2:3, Jenny's Joy 2:1, William's Winner 4:1, Billy Boy 14:1.
- Find the pay-out if each of the horses in 1 were to win with a \$10 bet.

## E Chance and data: Simulating experiments

Assign random numbers generated by a calculator (0–999) to model the spin of this spinner and model 20 spins.



## F Chance and data: Stem and leaf plots

Place the following scores of two players from a junior ten pin bowling team in a back-to-back stem and leaf plot in order to help judge the player of series:

William: (66, 31, 42, 49, 43, 58, 55, 59, 67, 67)

Walter: (40, 69, 68, 21, 32, 33, 41, 52, 53, 57)

## G Chance and data: Measures of central tendency

- When a number of households were surveyed as to how many litres of milk they use in a week they replied:  
{2, 3, 2, 2, 1, 1, 1, 2, 4, 8, 9, 8, 8, 5, 3, 3, 3, 2, 4, 3}  
(a) Remove the data from smallest to highest  
(b) find the mean value    (c) mode value    (d) median value
- In a highway survey, a machine counts the number of cars passing over a bridge on 112 consecutive days. The results are shown in this frequency table. Find the mean number of cars using the bridge each day.

Number of cars	Frequency
12	10
13	15
14	21
15	26
16	30
18	10

### H Chance and data: Measures of spread

The following are netball scores achieved throughout the finals series:

"Sharp eye" Sharon: (7, 14, 12, 15, 12)

"Long bomb" Brenda: (11, 13, 16, 6, 14)

Find each player's range, the mean and the standard deviation of their scores to decide who is the most consistent shooter.

### I Chance and data: Interquartile range and box and whisker plots

The following data represents ten single dart shots by Bill and Sam:

Bill: (1, 4, 5, 9, 13, 15, 17, 20, 21, 40)

Sam: (3, 7, 8, 9, 11, 12, 13, 15, 23, 35)

Show each on a box and whisker plot to help decide:

1 who is the most consistent shooter

2 who has the higher scores in general

### J Chance and data: Displaying continuous data

The following figures are the weight in grams of jelly beans eaten in a three minute jelly bean gobble competition. Tabulate the results using the intervals (250 to <275, 275 to <300, 300 to <325, 325 to <350, 350 to <375, 375 to <400) and display the results on a pie graph:

{260, 273, 252, 323, 378, 351, 292, 283, 254, 299, 315, 360, 392, 384, 331, 338, 384, 394}

### K Chance and data: Working with continuous data

The following figures are the length of licorice that competitors eat (in cm) in a two minute licorice strap gobble competition. Tabulate the results using the intervals (100 to <120, 120 to <140, 140 to <150, 150 to <160, 160 to <180, 180 to <200, 200 to <220, 220 to <240). Set up a cumulative frequency table, draw the resulting cumulative frequency bar chart and determine the median value of licorice gobbled.

{115, 123, 148, 230, 189, 238, 173, 179, 110, 115, 193, 230, 236, 142, 149, 201, 215, 165, 238, 204, 228, 234}

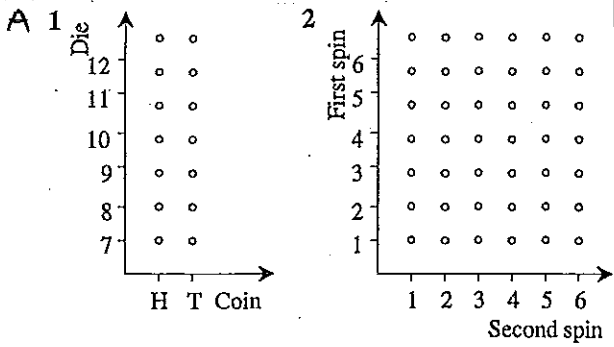
### L Chance and data: Probability of single and complementary events

Disks with the following numbers are placed in a bag

(1, 2, 2, 3, 3, 3, 4, 4, 5, 5, 5, 5, 5)

- 1 Find the probability of selecting an even numbered disk.
- 2 Find the probability of selecting an odd numbered disk.
- 3 Show that events 1 and 2 above are complementary.
- 4 Find the probability of choosing a number greater than 3.
- 5 Find the probability of choosing a number less than 4 or divisible by 5.

# Chance & Data Answers



**B 1**  $\left(\frac{6}{13}\right)^2 = \frac{36}{169}$       **2**  $\left(\frac{7}{13}\right)^2 = \frac{49}{169}$   
**3**  $\frac{6}{13} \times \frac{7}{13} = \frac{42}{169}$       **4**  $2 \times \frac{6}{13} \times \frac{7}{13} = \frac{82}{169}$

**C 1**  $\frac{3}{11}$       **2**  $\frac{2}{11}$       **3**  $\frac{3}{11}$       **4**  $\frac{6}{11}$

**D 1**

	(a)	(b)
Blue Boy	$\frac{1}{4}$	\$40
Alice's Girls	$\frac{1}{5}$	\$50
Ben Blitz	$\frac{3}{5}$	\$16.67
William's Winner	$\frac{1}{5}$	\$50
Alex's Girl	$\frac{1}{2}$	\$20
Katie's Cauldron	$\frac{1}{7}$	\$70
Jenny's Joy	$\frac{1}{3}$	\$30
Bully Boy	$\frac{1}{15}$	\$150

**E**

Number	Random number	Freq. from simulation
1	0 - 499	10
2	500 - 624	4
3	625 - 747	1
4	750 - 874	2
5	875 - 999	3

Sample simulation: (27, 816, 808, 138, 97, 447, 573, 582, 502, 306, 747, 279, 24, 892, 357, 215, 520, 913, 894, 222)

**F**

Walter	William
1	2
23	3
01	4
237	5
89	6

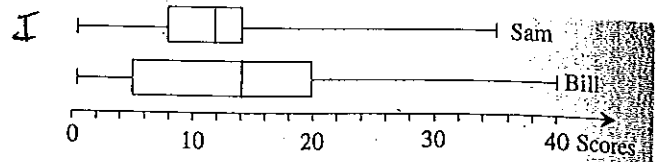
William appears to have higher scores than Walter.

**G 1** (a) (1, 1, 1, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 4, 4, 5, 8, 8, 8, 9)  
 (b) 3.7      (c) 2, 3      (d) 3  
**2** 14.8 cars

**H**

	Sharon	Brenda
Range	8	10
Mean	12	12
St. deviation	3.08	3.81

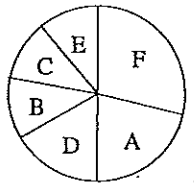
Even though their "mean" scores are the same, Sharon is the more consistent shooter of the series.



Sam's scores are more consistent than Bill's. Bill's scores are generally higher than Sam's.

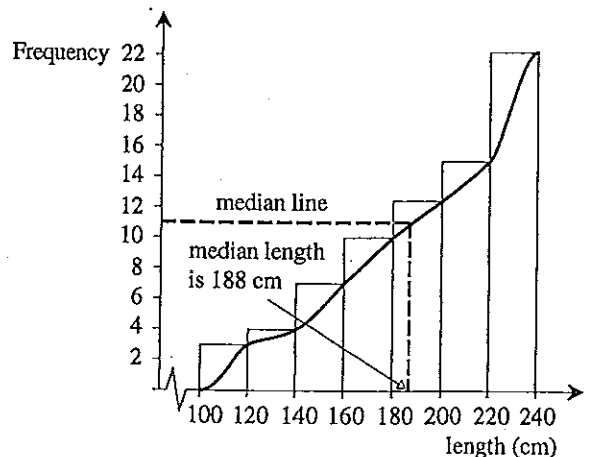
**J**

Jelly bean weight (g)	Tally	Freq.	Angle
A 250 to < 275		4	80°
B 275 to < 300		2	40°
C 300 to < 325		2	40°
D 325 to < 350		3	60°
E 350 to < 375		2	40°
F 375 to < 400		5	100°



**K**

Licorice length (cm)	Freq.	Cummulative freq.
100 to < 120	3	3
120 to < 140	1	4
140 to < 160	3	7
160 to < 180	3	10
180 to < 200	2	12
200 to < 220	3	15
220 to < 240	7	22



**L 1**  $\frac{4}{13}$       **2**  $\frac{9}{13}$       **3** Since  $\frac{4}{13} + \frac{9}{13} = 1$   
**4**  $\frac{7}{13}$       **5**  $\frac{11}{13}$