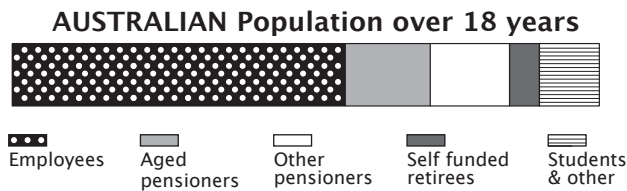


21. [Statistics / Probability]

Skill 21.1 Interpreting stacked bar graphs without a scale.

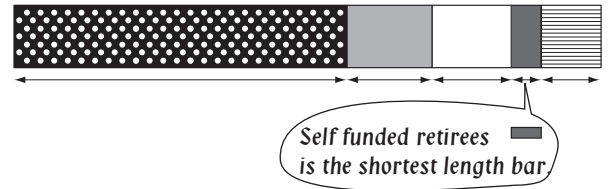
MM3.2 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

Q. Which group of Australians represent the smallest proportion of our over 18 population?

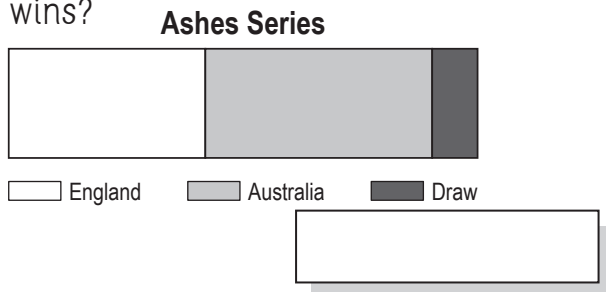


A. **Self funded retirees**

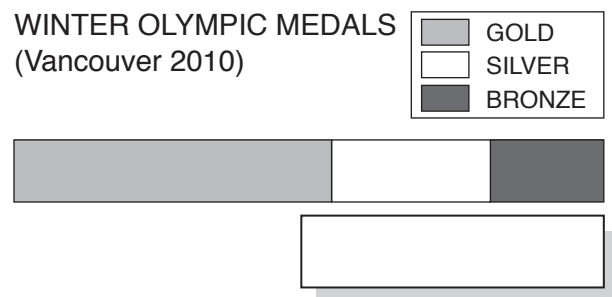
Compare the length of each shaded bar.



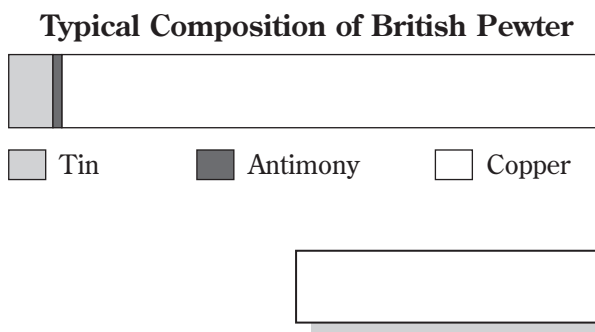
a) Australian and English cricketers have played for the Ashes since 1876. Which country has had the most wins?



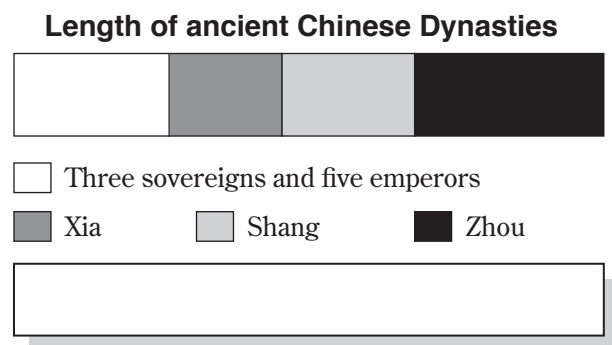
b) Which coloured medal did Canadians win second most at the 2010 Vancouver Winter Olympics?



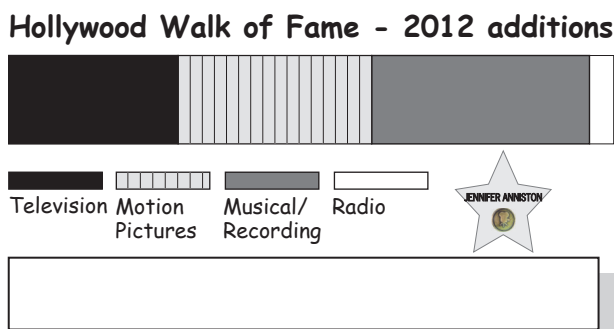
c) What is the main metal in British Pewter?



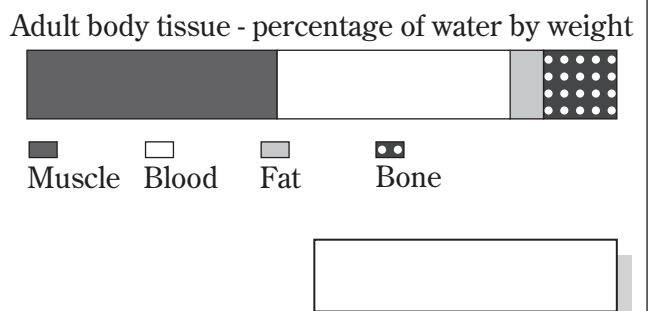
d) Which of the ancient Chinese dynasties reigned for the least amount of time?



e) Which category had the most additions to the Hollywood Walk of Fame in 2012?

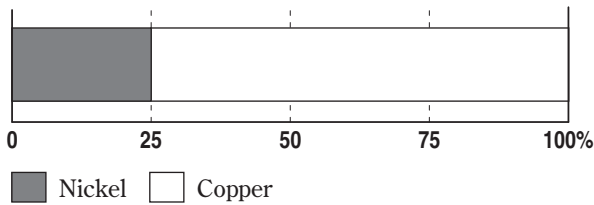


f) Which of the types of adult body tissue shown has the lowest percentage of water?



Q. What percentage of a typical 50 cent piece is copper?

Typical composition of a 50¢ piece



A. 75%

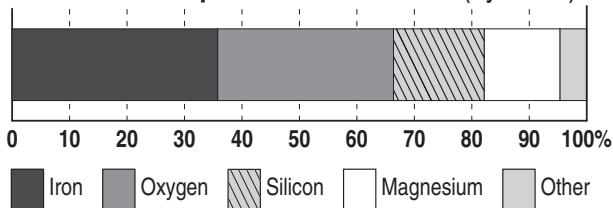
The copper section of the bar is shaded white.

It runs from 25% to 100%.

$$100 - 25 = 75$$

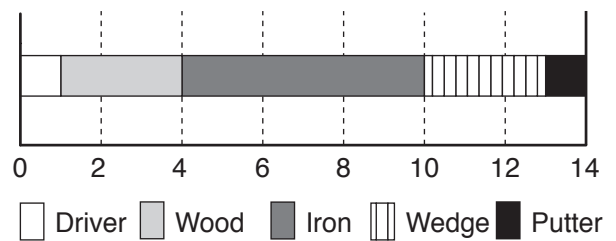
a) Which chemical element makes up the largest proportion of the Earth's mass?

Chemical composition of the Earth (by mass)



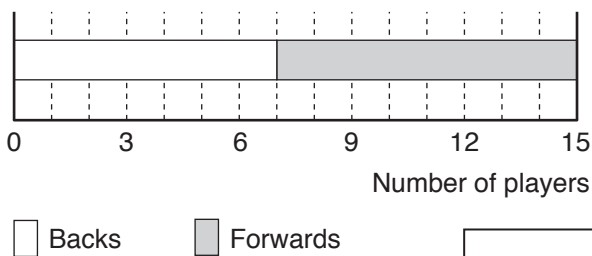
b) How many irons are there in this set of golf clubs?

Set of Golf Clubs



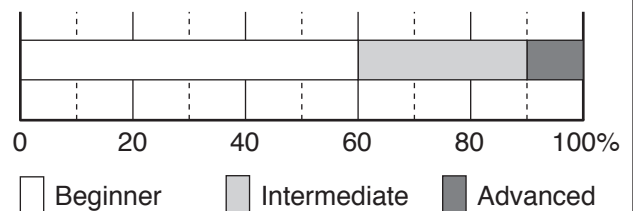
c) How many forwards in a rugby union team?

Rugby Union Team



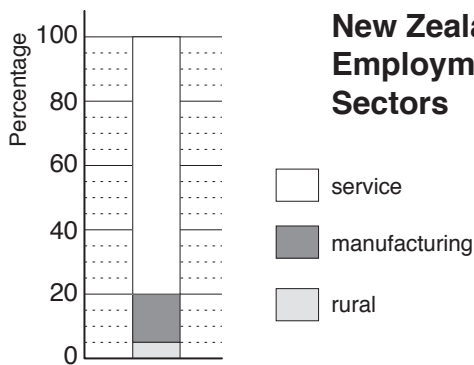
d) What percentage of 12 year olds have intermediate photographic skills?

Photographic skill of 12 year olds


 %

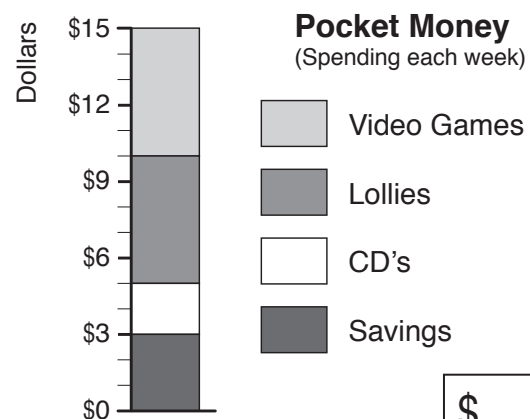
e) Which sector employs 15% of New Zealanders?

New Zealand Employment Sectors



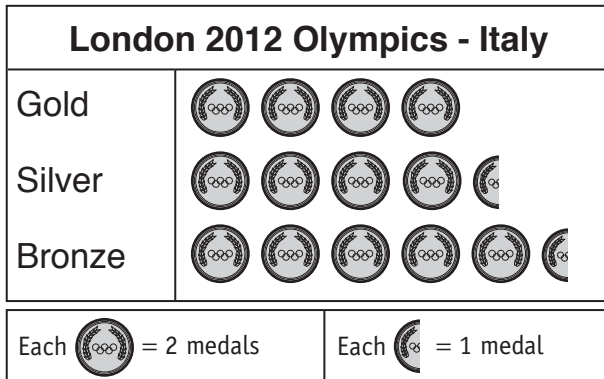
f) How much is spent on lollies and video games each week?

Pocket Money (Spending each week)


 \$

- Add the value of each symbol in the category.

Q. How many silver medals did Italy win at the London 2012 Olympics?



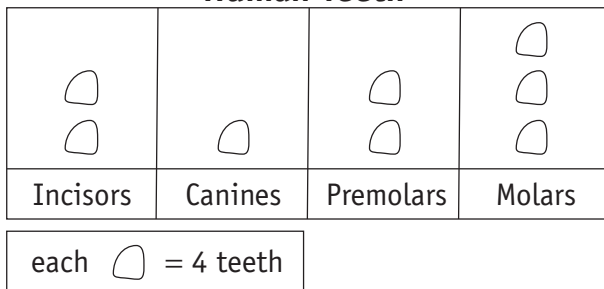
A. $2 + 2 + 2 + 2 + 1 = 9$

The silver category has 4 complete medals and half a medal.



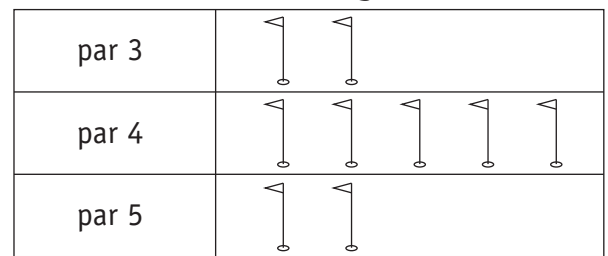
a) How many premolars does a human have?

Human Teeth



b) How many par 4 holes on the Augusta National golf course?

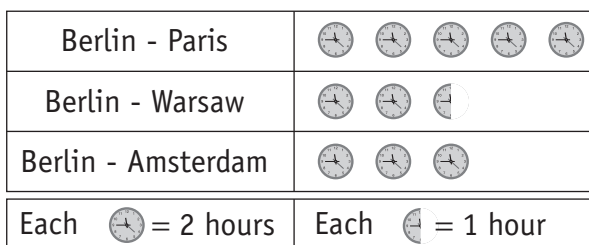
Augusta National



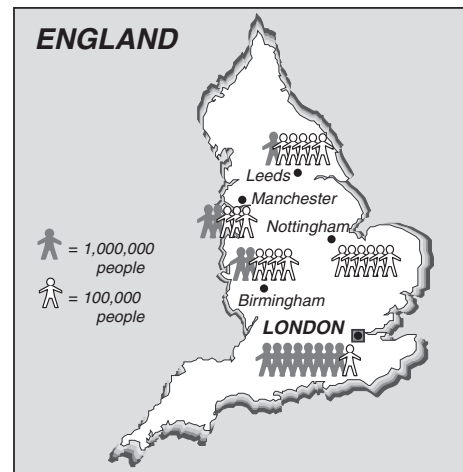
Each = 2 holes

c) Which city is a 5 hour drive from Berlin?

Drive Time

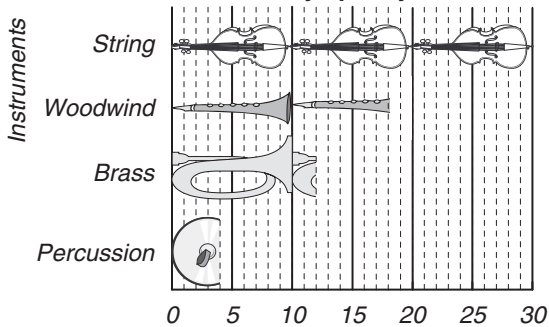


d) What is the population of Birmingham?



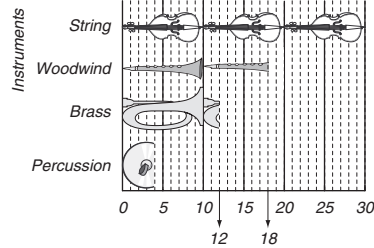
Q. How many more woodwind than brass instruments are in the ABC Symphony Orchestra?

Instruments in the ABC Symphony Orchestra



A. 6

Instruments in the ABC Symphony Orchestra



Each interval on the scale equals one instrument.

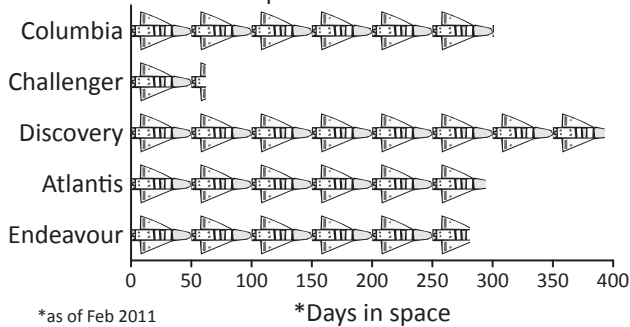
There are 18 woodwind instruments.

There are 12 brass instruments.

$$18 - 12 = 6$$

a) Which space shuttle has spent closest to 1 year in space?

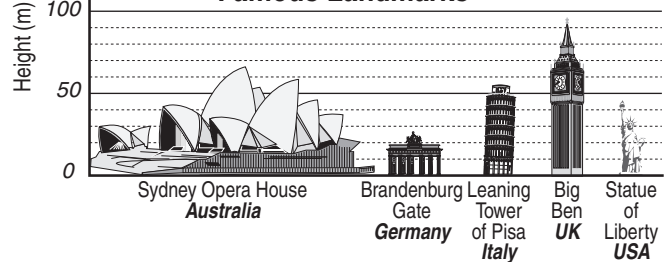
Space Shuttles - NASA



*as of Feb 2011

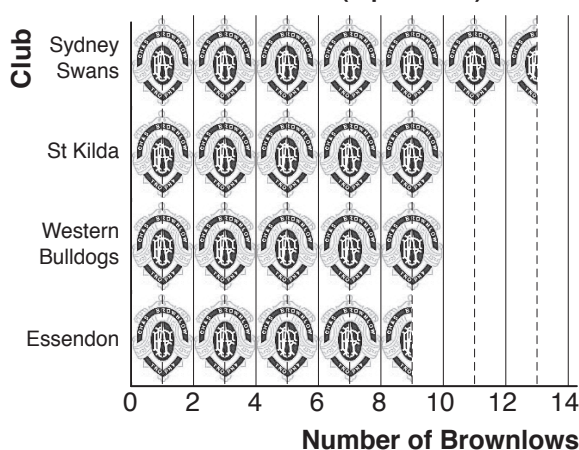
b) Which landmark is closest to 70 m in height?

Famous Landmarks



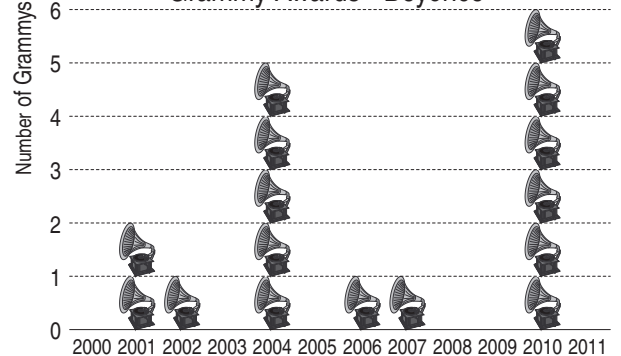
c) How many Brownlow medals in total have been won by Essendon and the Sydney Swans?

AFL Brownlow medal winners
1924 - 2012 (top 4 clubs)

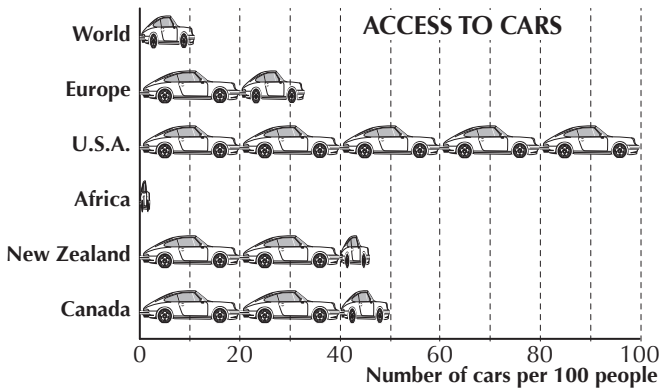


d) In which year did Beyonce win her 9th grammy award?

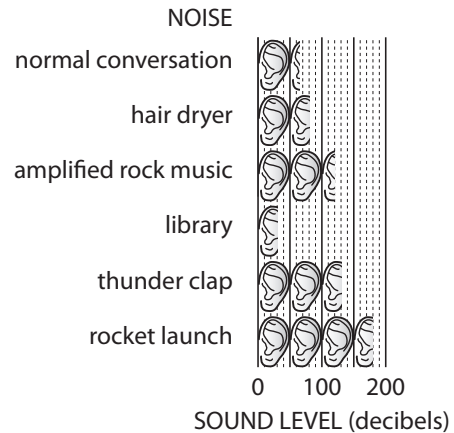
Grammy Awards - Beyonce



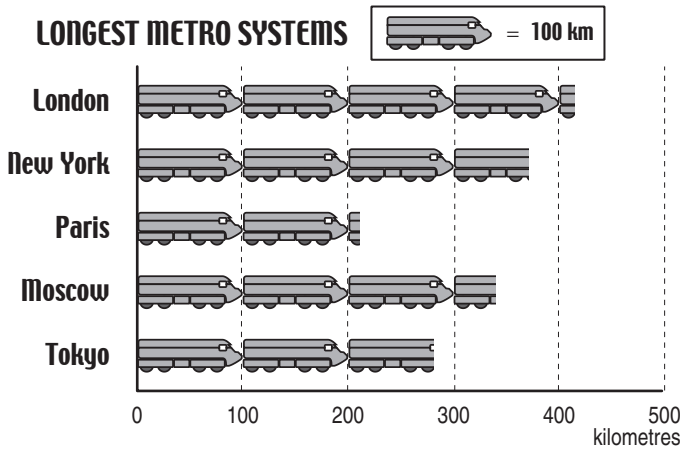
e) How many cars per 100 people are there in Canada?



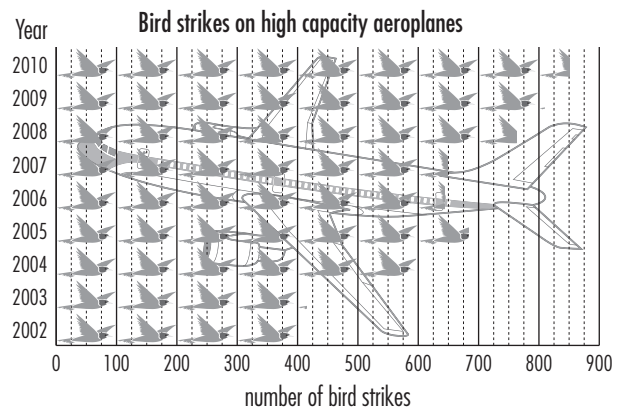
f) Pain is felt once a sound goes beyond 125 decibels. How many of these sounds would hurt your ears?



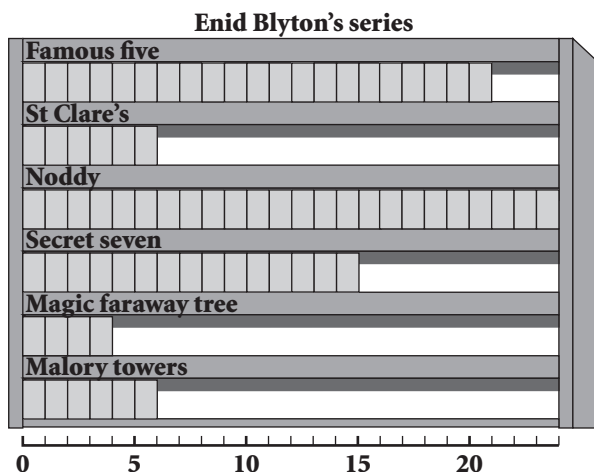
g) Name the cities with metro systems between 300 and 400 kilometres in length.



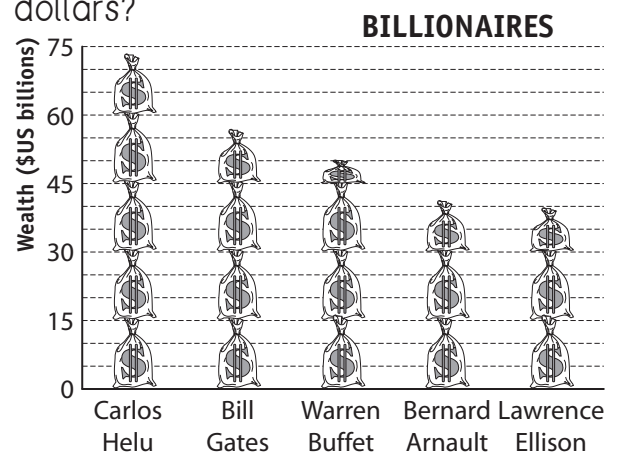
h) How many of the years shown had between 600 and 700 birds hitting high capacity aeroplanes.



i) Which Enid Blyton Series has 15 books?



j) Which of these billionaires has a wealth of approximately 50 billion dollars?



- Check what each row and column represents.

Q. Which lessons are Australian girls most likely to choose?

Cultural lessons - Australian Children (5 - 14)

Class	Participation Rate (%)	
	Boys	Girls
Musical Instrument	13	22
Singing	3	7
Dancing	2	24
Drama	3	6

A. **Dancing**

Cultural lessons - Australian Children (5 - 14)

Class	Participation Rate (%)	
	Boys	Girls
Musical Instrument	13	22
Singing	3	7
Dancing	2	24
Drama	3	6

First find the 'girls' column.

Then check participation rates down the column. The highest is 24%.

Trace the 24% back along the row to its title, dancing.

a) Which Australian state recorded the earthquake with the highest magnitude?

Date	Location	State	Magnitude
27.05.2013	NE of Koorda	WA	2.4
25.05.2013	NW of Koorda	WA	1.7
25.05.2013	W of Macquarie Island	WA	4.9
22.05.2013	S of Mundubbera	QLD	2.5
22.05.2013	Franklin River	WA	2.6

b) Which Imperial ship is closest in length to the Rebellion ship the Y-wing?



Rebellion Ships	Length (m)	Imperial Ships	Length (m)
X-wing	12.5	Twin-Ion Engine Starfighters (TIE)	6.3
Y-wing	16	Imperial Shuttle	20
B-wing	16.9	AT - AT	14
Blockade Runner	150	Imperial Star Destroyer	1600
Mon Calamari Cruiser	1200	Death Star	120 000

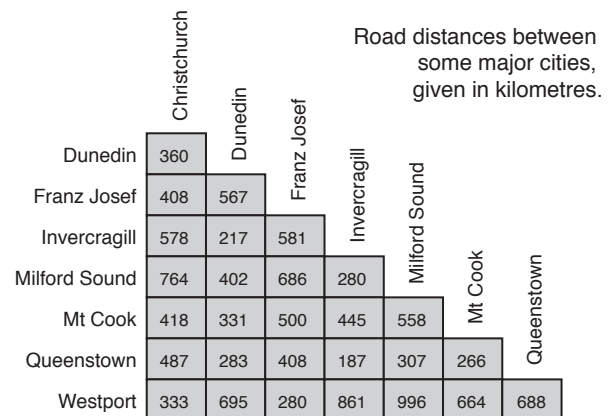
c) Which group, males or females, are twice as likely to play with the Wii as their primary console?

Primary Console Players

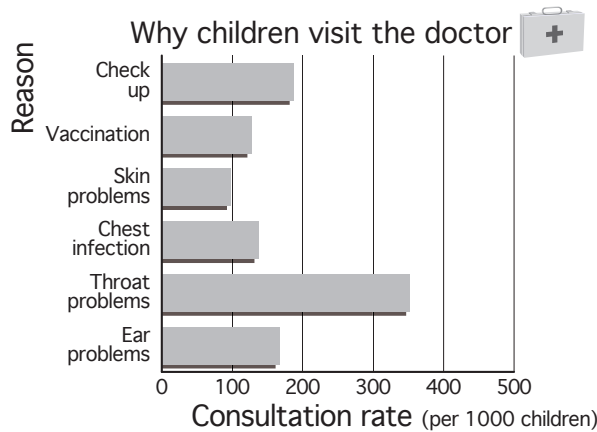
Console	Males	Females
X box 360	11%	38%
Wii	80%	41%
PS3	9%	21%

d) How far is it from Invercargill to Queenstown?

South Island New Zealand


 km

Q. What was the most common reason for children to visit the doctor?

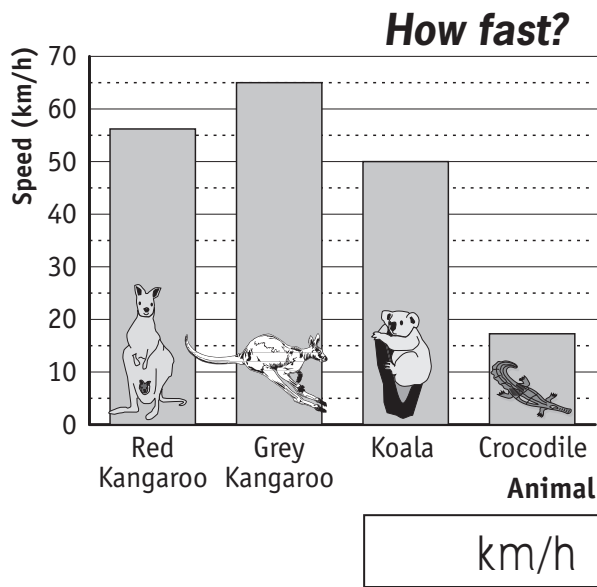


A. **Throat problems**

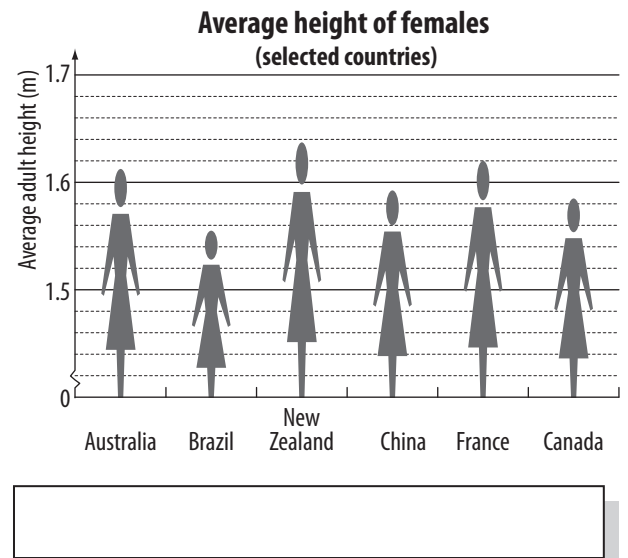
Check the scale along the base of the graph. The more visits to the doctor, the longer the bar.

The longest bar is beside 'Throat problems'.

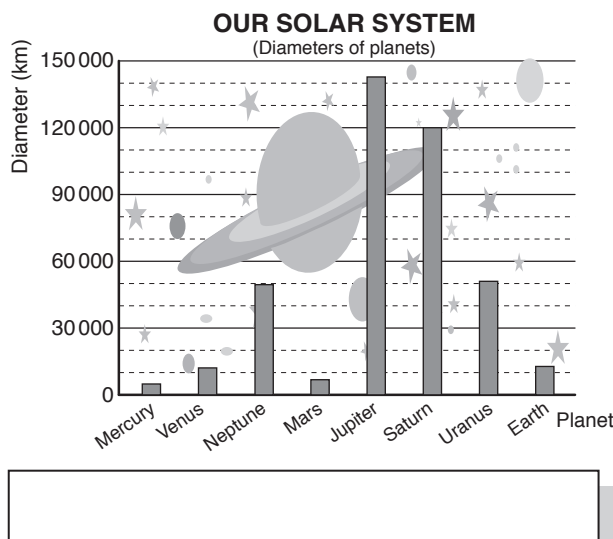
a) What speed can a koala reach?



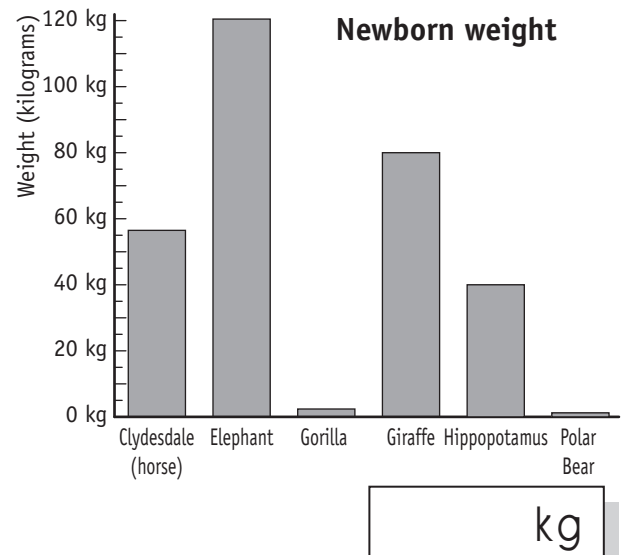
b) Which of the countries shown has the tallest woman?



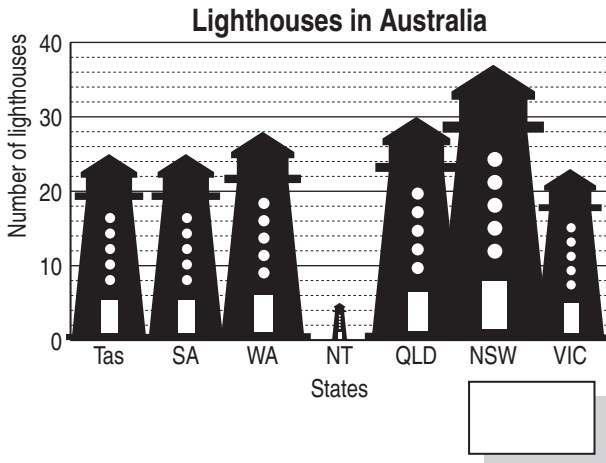
c) Name the planet with the greatest diameter.



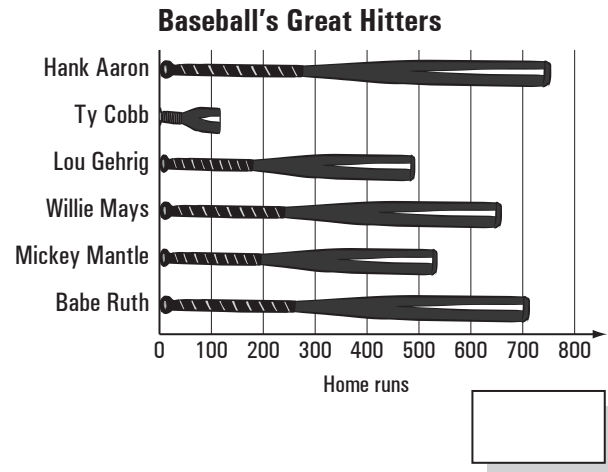
d) What is the weight of a newborn giraffe? [Give your answer to the nearest ten.]



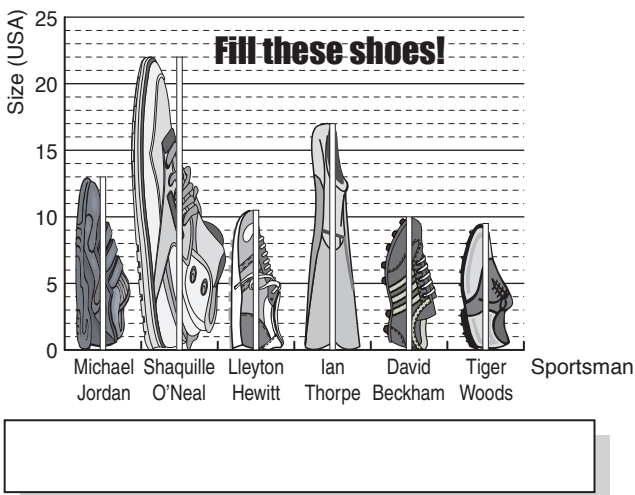
e) How many more lighthouses are there in Queensland than Victoria?



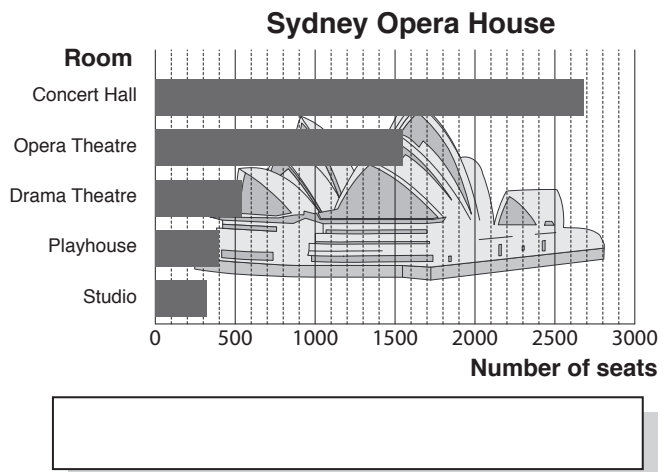
f) How many of baseball's great hitters have made over 700 home runs?



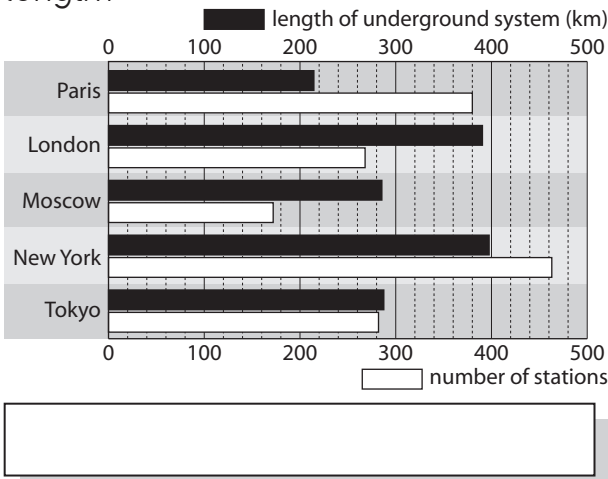
g) Who is closest to filling Shaquille O'Neals' one shoe with two shoes?



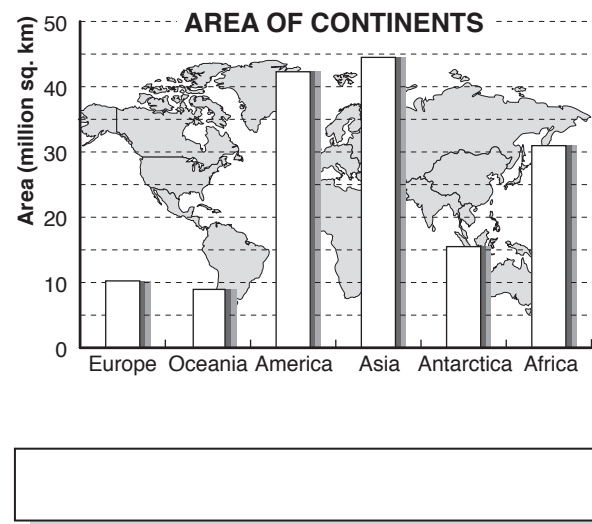
h) Harry booked the 398th and last seat in the room. Which part of the Sydney Opera House was Harry in?



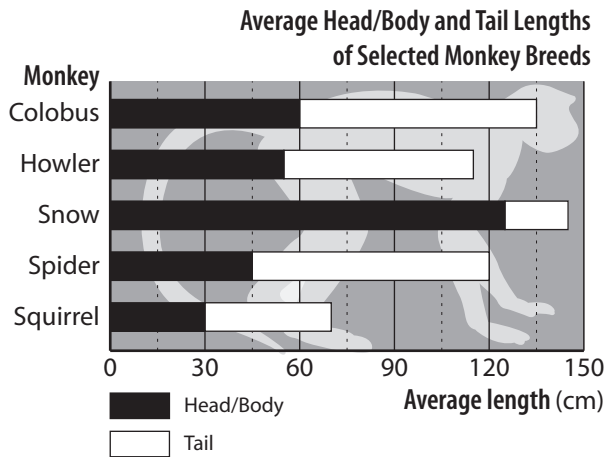
i) The underground railway system in which city has nearly the same number of stations as kilometres in its length?



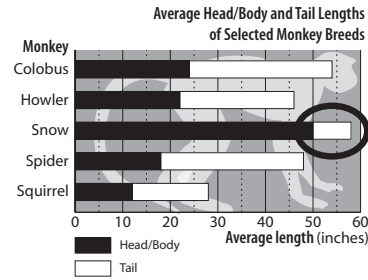
j) Which continent is closest to 15 million square kilometres in area?



Q. Which of these monkeys has the shortest average tail length?



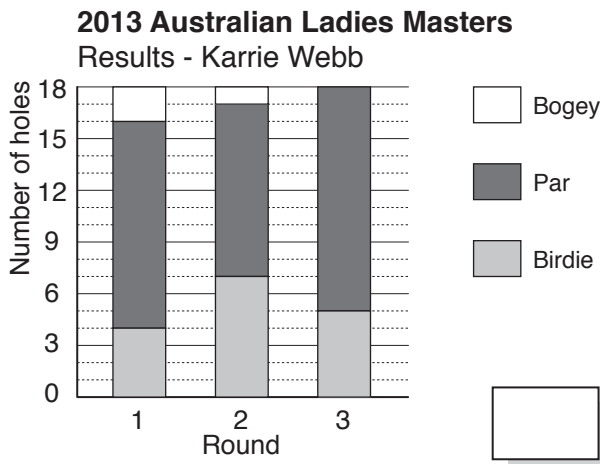
A. Snow monkey



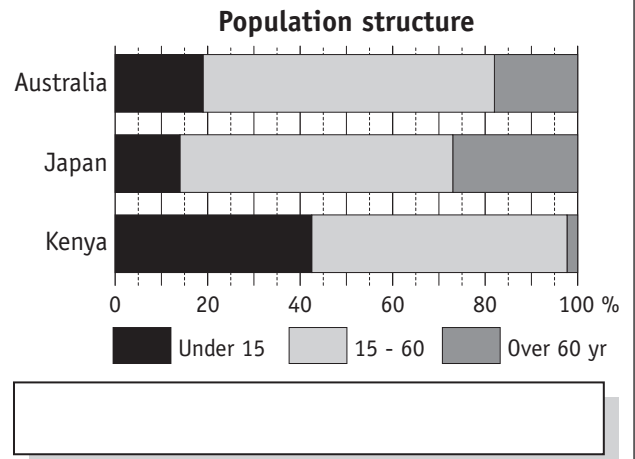
Check the scale along the base of the graph. The shorter the tail length, the shorter the bar.

Check the key. The white bars represent the tail. The shortest white bar is beside the snow monkey.

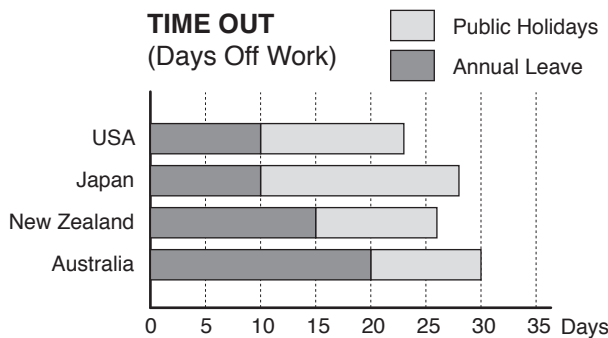
a) In which round of the 2013 Australian Masters did Karrie Webb score the least pars?



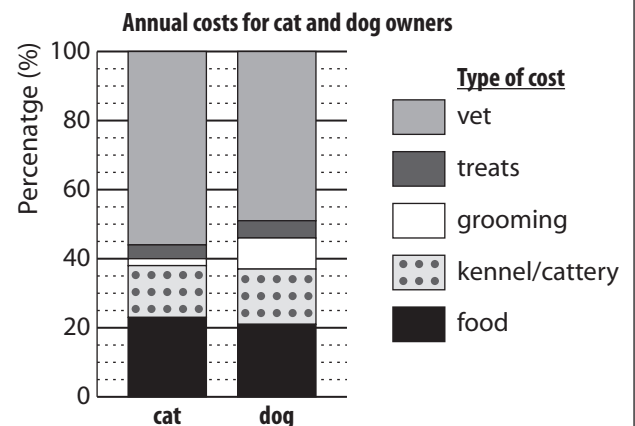
b) Which of the 3 countries shown has the largest percentage of under 15 year olds in their population structure?



c) Which country has the greatest number of public holidays?



d) Which expense is greater than the cost of food for both dog and cat owners?



Q. Which alternative is closest in meaning to the expression "Par for the course"?

- A) certain
- B) likely
- C) impossible

A. B

Consider each alternative.

Par on a golf course is set so that 'some' people can achieve it.

Par is neither certain, nor impossible.

a) Choose the best phrase (*is likely to / is unlikely to / will not*) to complete this statement:

"The moon collide with the Earth tonight."

b) Which alternative is closest in meaning to the expression "Find a needle in a haystack"?

- A) occurs about half the time
- B) not common
- C) extremely rare

c) Which alternative is closest in meaning to the expression "Skating on thin ice"?

- A) most likely to succeed
- B) unlikely to succeed
- C) certain to succeed

d) Which alternative is closest in meaning to the expression "It's a toss up"?

- A) 50 - 50 chance
- B) unlikely
- C) impossible

e) Which alternative is closest in meaning to the expression "Fat chance"?

- A) 50 - 50 chance
- B) unlikely
- C) certain

f) Choose the best phrase (*is certain to / is likely to / is unlikely to / will not*) to complete this statement:

"The Southern Cross

be in the Southern sky."

g) Choose the best phrase (*is certain to / is likely to / is unlikely to / will not*) to complete this statement:

"A Russian win a Commonwealth Games gold medal."

h) Choose the best phrase (*is certain to / is likely to / is unlikely to / will not*) to complete this statement:

"Beethoven have played the piano."

- Q.** A bag contains the letters
A R C H I T E C T
Letters are drawn at random. How many letters do you need to pick from the box to be certain you can make the word CAR?

A. 9

It is possible to pick these letters first:
H, I, T, E, T

Then it is possible to pick these letters:
C, C

The next pick will either be an
A or an R

and still the word CAR cannot be formed.

Therefore all 9 letters must be picked to be certain that the word CAR is formed.

- a)** You have six 10-cent coins and ten 20-cent coins in your pocket. What is the smallest number of coins you need to take out of your pocket to be certain of having at least one of each coin?

11

- b)** In the game of Mahjong there are 16 wind tiles, 4 each of North, South, East and West. If the tiles are turned face down on the table, how many tiles do you need to select to be sure to choose at least one East wind?

- c)** You have 10 light bulbs and 3 do not work. What is the smallest number of light bulbs you must check to be certain of having a good one?

- d)** There are 6 orange, 8 blue and 10 red flippers in the swimming bag. How many flippers must you take out of the bag, without looking, to be sure you have a pair of orange flippers?

- e)** There are six pairs of runners in the back of Mike's closet. Because the closet is dark, how many individual runners must he take out of the closet to make sure he has a matching pair of runners?

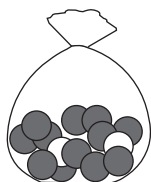
- f)** A shop keeper has six green cricket pads, four red pads and two white pads in the store room. There is a power failure and he reaches into the room in the dark. How many pads must he take out to be certain of having at least two green cricket pads?

- g)** A bag contains the letters
M E A S U R E M E N T
Letters are drawn at random. How many letters do you need to pick from the box to be certain you can make the word ME?

- h)** A bag contains the letters
M I S S I S S I P P I
Letters are drawn at random. How many letters do you need to pick from the box to be certain you can make the word SIP?

- Q.** A bag contains 2 white marbles and 12 green marbles. What is the chance that the first marble drawn will be white?

- A) impossible
B) unlikely
C) likely
D) certain



A. B

Only 2 of the 14 marbles are white. Only 2 out of 14 draws will give a white marble.

It is not impossible but it is unlikely that with your first draw you will pick a white marble.

There are 12 chances to draw a green marble.

- a)** In a lotto draw, balls numbered 1 to 50 are mixed together. A machine then randomly selects balls numbered 8, 14, 2, 26 and 42.

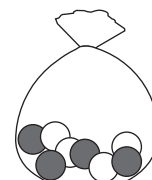
Is the sixth number drawn:

- A) more likely to be odd than even,
B) more likely to be even than odd or
C) just as likely to be odd as even?

A

- b)** A bag contains 4 white marbles and 4 green marbles. What is the chance that the first marble drawn will be orange?

- A) impossible
B) unlikely
C) likely
D) certain



- c)** In a lotto draw, balls numbered 1 to 50 are mixed together. A machine then randomly selects balls numbered 8, 14, 2, 21 and 17.

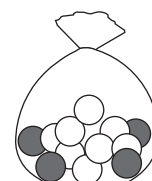
Is the sixth number drawn:

- A) more likely to be more than 25,
B) more likely to be less than 25 or
C) just as likely to be less than 25 as more than 25?



- d)** A bag contains 8 white marbles and 4 green marbles. What is the chance that the first marble drawn will be white?

- A) impossible
B) unlikely
C) likely
D) certain



- e)** A pack contains 5 white, 9 purple, 6 green and 3 orange jelly beans. What is the chance that the first jelly bean taken will be purple?

- A) impossible
B) unlikely
C) likely
D) certain



- f)** Amanda has six \$1 coins and twelve \$2 coins in her pocket. What is the chance that the first coin she takes out will be a \$1 coin?

- A) impossible
B) unlikely
C) likely
D) certain



$$\text{Probability of an event} = \frac{\text{number of favourable outcomes}}{\text{number of possible outcomes}}$$

- Find the number of favourable outcomes for the event.
- Find the total number of possible outcomes.
- Divide the number of favourable outcomes by the number of possible outcomes.

Q. What is the probability of rolling a number greater than 2 with one roll of a die? [Give the answer as a fraction in its simplest form.]



A. $\frac{2}{3}$

Event: rolling a number greater than 2

Favourable outcomes (FO): 4

(rolling 3, 4, 5 or 6)

Possible outcomes (PO): 6

(rolling 1, 2, 3, 4, 5, or 6)

Probability: 4 out of 6

or $\frac{4 \div 2}{6 \div 2} = \frac{2}{3}$

a) What is the probability of drawing a Queen from a standard deck of playing cards? [Give the answer as a fraction in its simplest form.]



$$\frac{FO}{PO} = \frac{4 \div 4}{52 \div 4} = \frac{1}{13}$$

$\frac{1}{13}$

b) What is the probability of throwing a dart inside an 11-point area when you hit the dart board? [Give the answer as a fraction in its simplest form.]



$$\frac{FO}{PO} = \frac{3 \div 3}{12 \div 3}$$

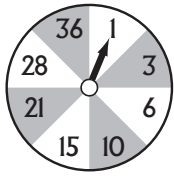
c) Each of the letters in PROBABILITY is put into a bag. If a letter is randomly selected, what is the probability of choosing a consonant? [Give the answer as a fraction in its simplest form.]

$$\frac{FO}{PO} =$$

d) A money bag contains twenty 50-cent coins and sixty 10-cent coins. A coin is randomly selected. What is the probability of a 50-cent coin being selected? [Give the answer as a fraction in its simplest form.]

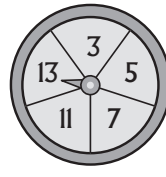
$$\frac{FO}{PO} =$$

- e) A spinner is spun. What is the probability that it will stop on an even number? [Give the answer as a fraction.]



$$\frac{FO}{PO} = \boxed{}$$

- f) A spinner is spun. What is the probability that it will stop on an odd number? [Give the answer as a fraction.]



$$\frac{FO}{PO} = \boxed{}$$

- g) A box has 10 chocolate, 10 plain and 12 creamed biscuits. If a biscuit is randomly selected from the box, what is the probability of choosing a plain biscuit? [Give the answer as a fraction.]

$$\frac{FO}{PO} = \boxed{}$$

- h) A deck of cards has 5 navy, 5 yellow and 5 black cards. A card is randomly picked from the deck. What is the probability of a black card being picked? [Give the answer as a fraction.]

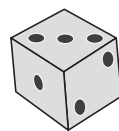
$$\frac{FO}{PO} = \boxed{}$$

- i) What is the probability of rolling a number less than 5 with one roll of a die? [Give the answer as a fraction.]



$$\frac{FO}{PO} = \boxed{}$$

- j) What is the probability of rolling an even number with one roll of a die? [Give the answer as a fraction.]



$$\frac{FO}{PO} = \boxed{}$$

- k) Ben and 11 other athletes are racing in the 800 m event. What is the probability that Ben will win one of 3 medals? [Give the answer as a fraction.]

$$\frac{FO}{PO} = \boxed{}$$

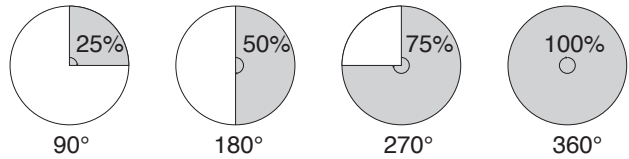
- l) Janet bought 20 raffle tickets. If there are 200 tickets altogether, what is the probability that one of her tickets will win? [Give the answer as a fraction.]

$$\frac{FO}{PO} = \boxed{}$$

- Consider each section of the pie chart as a sector of a circle (pie).

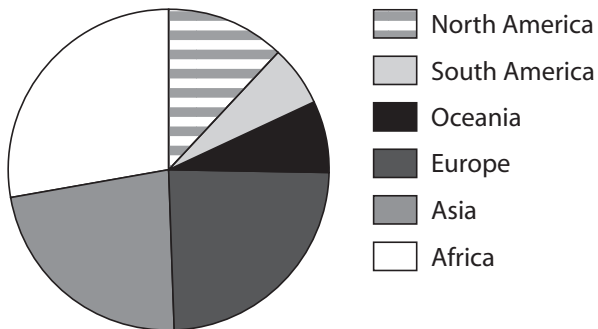
PIE CHARTS

Each piece of pie represents a percentage of the total.



Q. Which continent has the least number of countries?

Number of Countries by Continent

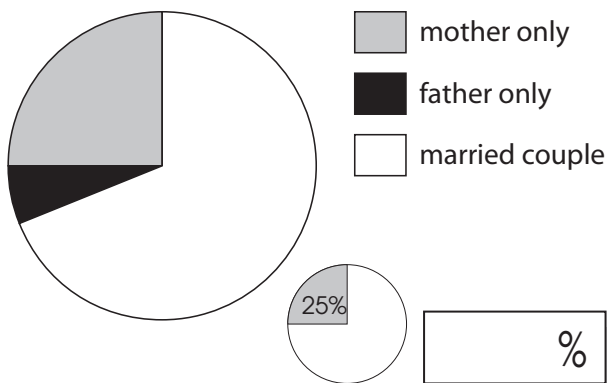


A. *South America*

Look for the smallest sector of the circle.
South America is slightly smaller than Oceania.

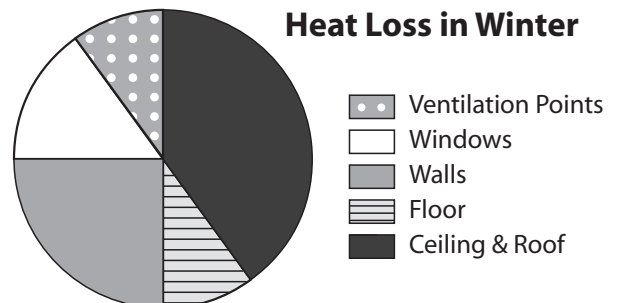
a) What percentage of children in the USA live with their mother only?

Child Population by Household USA



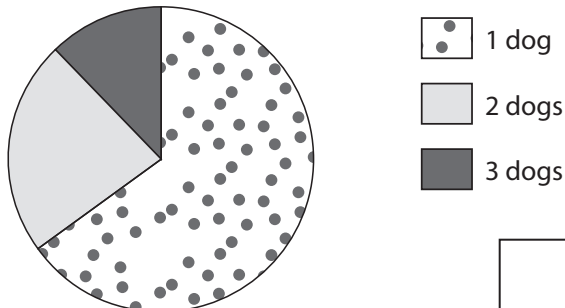
b) Which part of an insulated brick veneer home is responsible for one quarter of the heat loss in winter?

Insulated Brick Veneer Heat Loss in Winter



c) If you were one of the 65 000 000 households in the USA to have dogs as a pet, how many are you most likely to have?

Households With Dogs



d) Which age group accounts for closest to 20% of all facebook users?

Facebook Users by age (years) 2011

