# Conditional probability: two-way tables

ANSWERS

**1**

A book is chosen at random. **Given that** the book was borrowed by a child, which group do you look at? Find its total.

| | Fiction | Non-fiction | Total |
|---|---|---|---|
| Adult | 23 | 17 | |
| Child | 31 | 9 | 40 |
| Total | | | |

Look at: Child  Total: 40

**2**

A student is chosen at random. **Given that** the student is in Year 8, which group do you look at? Find its total.

| | Running | Jumping | Total |
|---|---|---|---|
| Year 7 | 16 | 19 | |
| Year 8 | 22 | 13 | 35 |
| Total | | | |

Look at: Year 8  Total: 35

**3** *Notice the change!*

A plant is chosen at random. **Given that** the plant has flowers, which group do you look at? Find its total.

| | Flowers | No flowers | Total |
|---|---|---|---|
| Indoor | 12 | 18 | |
| Outdoor | 27 | 13 | |
| Total | 39 | | |

Look at: Flowers  Total: 39

**4**

A student is chosen at random. **Given that** the student chose the zoo, which group do you look at? Find its total.

| | Museum | Zoo | Beach | Total |
|---|---|---|---|---|
| Year 9 | 14 | 21 | 10 | |
| Year 10 | 18 | 15 | 12 | |
| Total | | 36 | | |

Look at: Zoo  Total: 36

**5**

A cake is chosen at random. **Given that** the cake is chocolate, find the probability that the cake is large.

| | Large | Small | Total |
|---|---|---|---|
| Chocolate | 18 | 24 | 42 |
| Lemon | 11 | 7 | 18 |
| Total | 29 | 31 | 60 |

Look at: Chocolate  Total: 42

Of these, Large: 18

Probability: $\frac{18}{42} = \frac{3}{7}$

**6**

A bike is chosen at random. **Given that** the bike is a mountain bike, find the probability that the bike is red.

| | Red | Blue | Total |
|---|---|---|---|
| Road | 9 | 16 | 25 |
| Mountain | 21 | 14 | 35 |
| Total | 30 | 30 | 60 |

Look at: Mountain  Total: 35

Of these, Red: 21

Probability: $\frac{21}{35} = \frac{3}{5}$

**7** *Notice the change!*

A piece of fruit is chosen at random. **Given that** the piece of fruit is green, find the probability that the piece of fruit is an apple.

| | Green | Red | Total |
|---|---|---|---|
| Apple | 15 | 25 | 40 |
| Pear | 20 | 4 | 24 |
| Total | 35 | 29 | 64 |

Look at: Green  Total: 35

Of these, Apple: 15

Probability: $\frac{15}{35} = \frac{3}{7}$

**8**

A dog is chosen at random. **Given that** the dog is a puppy, find the probability that the dog is large.

| | Puppy | Adult | Total |
|---|---|---|---|
| Small | 6 | 14 | 20 |
| Medium | 9 | 21 | 30 |
| Large | 5 | 25 | 30 |
| Total | 20 | 60 | 80 |

Probability: $\frac{5}{20} = \frac{1}{4}$

# Conditional probability: two-way tables *further practice*

ANSWERS

**9**

The table shows how 90 people travelled to a festival. A person is chosen at random. Given that the person is under 25, find the probability that they came by train.

| | Train | Car | Total |
|---|---|---|---|
| Under 25 | 27 | 18 | 45 |
| 25 and over | 21 | 24 | 45 |
| Total | 48 | 42 | 90 |

27 out of the 45 under 25

Answer: $\frac{27}{45} = \frac{3}{5}$

**10**

The table shows the ice creams a van sold. An ice cream is chosen at random. Given that it is strawberry, find the probability that it was in a tub.

| | Vanilla | Mint | Strawberry | Total |
|---|---|---|---|---|
| Cone | 19 | 8 | 12 | 39 |
| Tub | 11 | 14 | 16 | 41 |
| Total | 30 | 22 | 28 | 80 |

16 out of the 28 strawberry

Answer: $\frac{16}{28} = \frac{4}{7}$

**11**

The table shows the students in a school's choir and band. One is chosen at random.
(a) Given that the student is in Year 7, find the probability that they sing in the choir.
(b) Given that the student sings in the choir, find the probability that they are in Year 7.

| | Choir | Band | Total |
|---|---|---|---|
| Year 7 | 15 | 10 | 25 |
| Year 8 | 9 | 16 | 25 |
| Total | 24 | 26 | 50 |

(a) 15 out of 25

(b) 15 out of 24

Answer: (a) $\frac{3}{5}$ (b) $\frac{5}{8}$

**12**

Complete the table. A student is chosen at random. Given that the student has a dog, find the probability that they are in Year 10.

| | Dog | No dog | Total |
|---|---|---|---|
| Year 9 | 13 | 22 | 35 |
| Year 10 | 17 | 28 | 45 |
| Total | 30 | 50 | 80 |

30 − 13 = 17 in Year 10 have a dog

Answer: $\frac{17}{30}$

**13**

Complete the table. A customer is chosen at random. Given that the customer paid by card, find the probability that they bought juice.

| | Coffee | Tea | Juice | Total |
|---|---|---|---|---|
| Card | 24 | 15 | 9 | 48 |
| Cash | 6 | 10 | 16 | 32 |
| Total | 30 | 25 | 25 | 80 |

48 − 24 − 15 = 9 bought juice by card

Answer: $\frac{9}{48} = \frac{3}{16}$

**14**

A climbing club has 60 members. 25 are juniors. 14 of the juniors and 21 of the seniors can lead a climb. Complete the table. Given that a member can lead a climb, find the probability that they are a junior.

| | Can lead | Cannot lead | Total |
|---|---|---|---|
| Junior | 14 | 11 | 25 |
| Senior | 21 | 14 | 35 |
| Total | 35 | 25 | 60 |

14 out of the 35 who can lead

Answer: $\frac{14}{35} = \frac{2}{5}$

**15**

Max says the probability that a student plays netball, given that they are in Year 8, is $\frac{16}{30}$. Is Max right? Explain.

| | Year 7 | Year 8 | Total |
|---|---|---|---|
| Football | 18 | 12 | 30 |
| Netball | 14 | 16 | 30 |
| Total | 32 | 28 | 60 |

28 students are in Year 8, not 30

Answer: No, $\frac{16}{28} = \frac{4}{7}$

**16**

The table shows the customers at a café's two shops. Ali says a customer at the Station shop is more likely to order food, because more of them did. Is Ali right? Show how you know.

| | Food | Drink only | Total |
|---|---|---|---|
| Station | 36 | 54 | 90 |
| Market | 28 | 22 | 50 |
| Total | 64 | 76 | 140 |

$\frac{36}{90} = 0.4$, $\frac{28}{50} = 0.56$

Answer: No: 0.4 < 0.56