

# **E3 Numeracy**

## **Unit 5**

### **Data Handling**

## What does it all mean?

### Activity 1

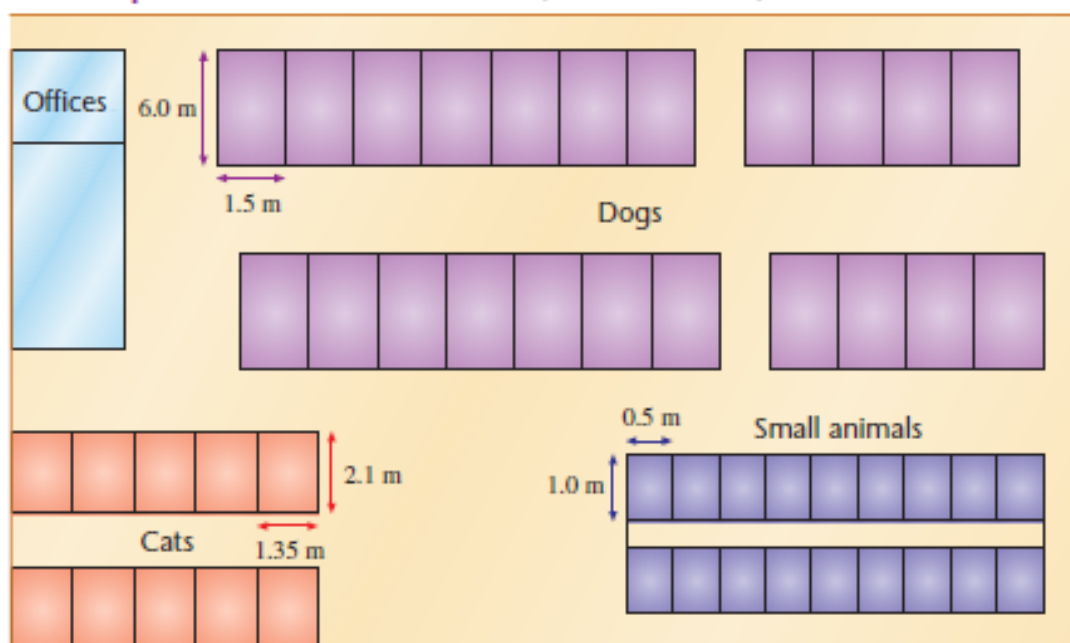
*We have a plan of the animal shelter to help people find their way around. Each animal has its own space. We make sure our animals have plenty of room.*

#### Remember

You need **all** this information to help you make sense of a plan.

- **A title** – this tells you what the plan is for.
- **Labels** – these tell you what the different parts on the plan mean.
- **Measurements** – these show the lengths of parts on the plan.

#### Plan of part of the animal shelter (not drawn to scale)



Each small animal has a space that is 0.5 m wide and 1.0 m deep.

1 How much space does a dog have? ..... m wide and ..... m deep

2 How much space does a cat have? ..... m wide and ..... m deep

There are 18 cages for small animals.

3 Which type of animal has most cages? .....

4 Which animal has fewest cages? .....

## Activity 2

People have to pay to take pets home from the animal shelter. This is called 're-homing'. The people are called 're-homers'. We also charge to look after pets while their owners are away. This is called 'boarding'. This gives us enough money to run the shelter.

Here is a list of our charges.

| THE SANCTUARY ANIMAL SHELTER |                    |                      |
|------------------------------|--------------------|----------------------|
| CHARGES                      |                    |                      |
| RE-HOMING                    |                    | BOARDING             |
| £80.00                       | Dogs               | £7.50 per day        |
| £50.00                       | Cats               | £3.00 per day        |
| £25.00                       | Rabbits            | £2.00 per day        |
| Up to £10.00                 | Various small pets | £2.00–£2.50 per week |

To find out how much it costs to take home a cat, look for 'cats', then look across to the left in the 're-homing' column. You will see £50.00. This is the amount you pay to re-home a cat.

'Various small pets' includes animals such as gerbils, mice, budgies and other birds.

- What is the cost of re-homing a dog? .....
- What is the cost per day for boarding a rabbit? .....
- What is the cost of re-homing a rabbit? .....
- How much does it cost to board a cat for
  - one day? .....
  - two days? .....
  - a week? .....
- What is the maximum price to re-home a mouse? .....
- What is the cost of boarding a gerbil for a week?
  - maximum cost = .....
  - minimum cost = .....



### Activity 3

At the animal shelter, we divide the dogs into two types: pedigrees and crossbreeds. Most of the dogs in the shelter are crossbreeds but there are always a few pedigree dogs. The dogs are of different sizes: small, medium and large. We use a table to show people how many dogs we have, in which sizes and of which type.

**Types and sizes of dogs in the animal shelter – June 2002**

| Type of dog | Size of dog |        |       |
|-------------|-------------|--------|-------|
|             | Small       | Medium | Large |
| Pedigree    | 1           | 2      | 6     |
| Crossbreed  | 7           | 11     | 13    |

*To find out how many medium-sized pedigree dogs we have, I find the heading 'Pedigree' in the first column ... look along the top row until I see 'Medium'... and I see that we have two medium-sized pedigree dogs.*

#### Remember

##### Making sense of tables

- Tables are made up of **rows** and **columns**. Rows are horizontal. Columns are vertical. You need all this information to help you to make sense of a table.
- **A title** – this tells you what the table is about.
- **Row heading** – this tells you what is in the row.
- **Column heading** – this tells you what is in the column.



Look at all the parts of the table – the title, the rows and the columns – to answer these questions.

- 1 When was the information gathered? .....
- 2 How many large pedigree dogs do we have? .....
- 3 How many medium-sized crossbreed dogs do we have? .....
- 4 How many small pedigree dogs do we have? .....

How many small dogs are there altogether?

Look down the column headed 'small'. There is one pedigree dog and seven crossbreed dogs, so there are eight small dogs altogether.

- 5 How many large dogs are there in the shelter altogether? .....
- 6 How many crossbreed dogs do we have? .....
- 7 How many dogs do we have in the shelter altogether? .....

## How many dogs?

### Activity 4

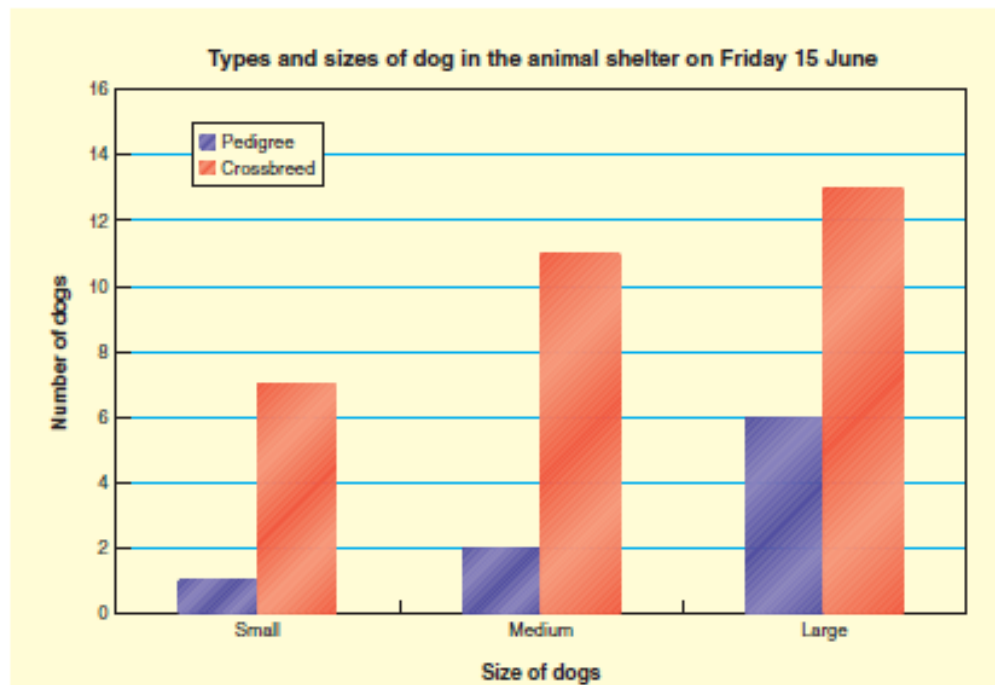
*I use bar charts to show information. The vertical axis shows the number of dogs.*

#### Remember

**Making sense of bar charts.**

- Read the **title** to find out what the bar chart is about.
- The **horizontal axis** is the line going along the bottom. There is a name under each bar. There is a label telling you what the bars represent.
- The **vertical axis** is the line going up the left-hand side. It has numbers at equal intervals. There is a label telling you what the numbers represent. Make sure you look closely at the numbers on the vertical axis.
- Look at the **labels** on the **axes**.
- There is a **key** telling you what the colours mean.

Look at the **blue bar** for medium dogs. It is for pedigrees.



The horizontal axis shows the sizes and types of dog.

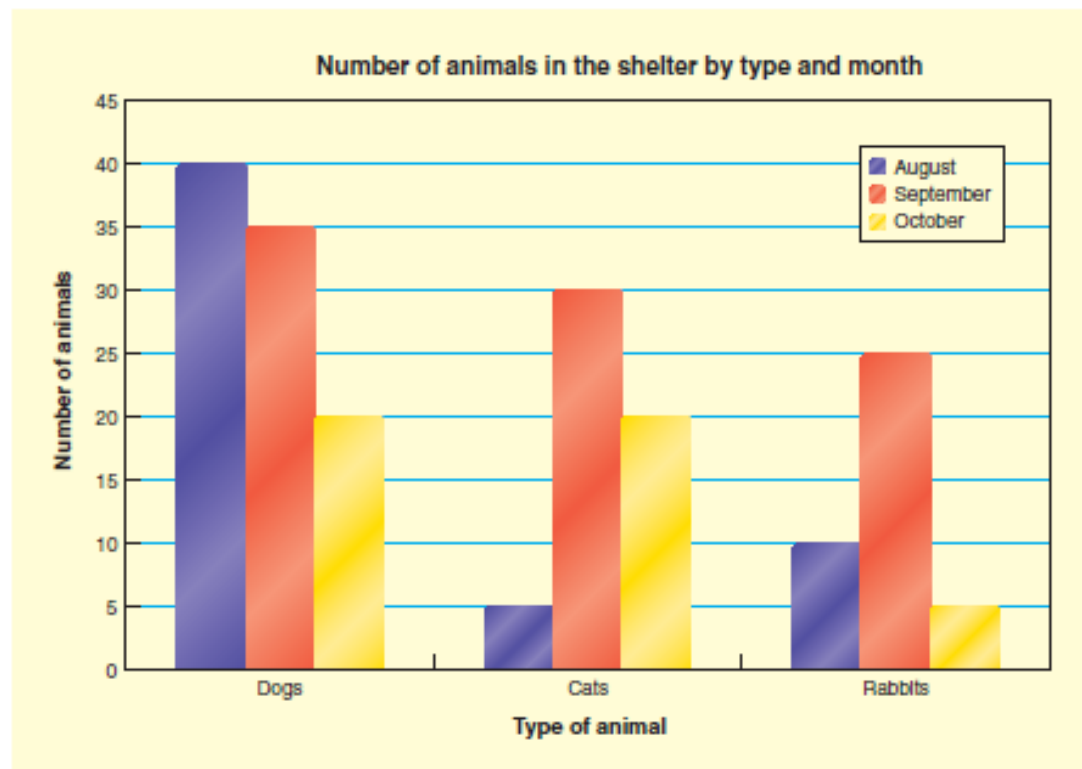
- 1 When was the information gathered? .....
- 2 What do the red columns show? .....
- 3 How many large crossbreeds do we have? .....
- 4 How many small pedigree dogs do we have? .....
- 5 How many medium dogs do we have altogether? .....
- 6 Which size of dog do we have most of? .....
- 7 How many pedigree dogs are there in the shelter? .....

# Are there more or less?

We need to compare the numbers of animals we have in the shelter from month to month.

## Activity 5

We use bar charts to help us compare figures about the animals.  
Here is a bar chart showing the number of dogs, cats and rabbits at the shelter in August, September and October.



The yellow columns show the numbers for October.

1 Which month is represented in blue? .....

The shortest column for dogs is yellow, so we had fewest dogs in October.

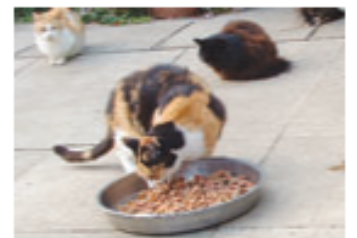
2 We had most dogs in .....

3 We had fewest cats in .....

Now use the chart to find the numbers of animals.

4 We had ..... rabbits in September.


















5 We had ..... cats during the three months shown.







## Activity 6

People come to the shelter to choose a pet. I use pictograms to help them understand and compare information.

The number of people who took cats from the shelter in the first four months of 2002

| Month    |  |
|----------|--|
| January  |      |
| February |     |
| March    |      |
| April    |      |

 represents 5 people.  represents 4 people.

- 1 What does  represent? .....
- 2 What does  represent? .....
- 3 Count up the symbols and complete the table below to show the numbers of people who re-homed cats.

| January | February | March | April |
|---------|----------|-------|-------|
|         |          |       |       |

- 4 In which month were most cats re-homed? .....
- 5 Write down a quick way of finding the answer. ....
- 6 In which month were fewest cats re-homed? .....
- 7 Write down a quick way of finding the answer. ....

### Remember

#### Pictograms


- Try to use a simple symbol or picture – remember, you may have to draw each one many times and they **must** be identical!
- Symbols must be in neat columns and rows.
- Include a key to show the number of items a symbol stands for.
- Use part of the symbol to represent smaller numbers.

# Tally!

*We collect lots of information about our animals.  
We use a tally chart to record the information.*

## Remember

### Tallying

- For each unit, you write a tally mark, like this | .
- When you have five units, make your fifth line go through the other four, like this: . You can then count the answers in batches of 5.
- Tick or cross off each entry as you put it into the tally chart. This will help you to keep track of which results you have not yet tallied.

## Activity 7

We need to find out if the new owners already own a dog.

We asked 20 people wanting to re-home a dog how many dogs they already had.

These were the answers.

|         |         |          |         |
|---------|---------|----------|---------|
| 0 dog ✓ | 0 dog ✓ | 0 dog ✓  | 0 dog ✓ |
| 0 dog ✓ | 1 dog ✓ | 2 dogs ✓ | 0 dog ✓ |
| 1 dog   | 0 dog   | 0 dog    | 0 dog   |
| 0 dog   | 0 dog   | 2 dogs   | 1 dog   |
| 0 dog   | 0 dog   | 0 dog    | 3 dogs  |




Most people had no dogs but some have one or two, or even three.

Use the tally chart below to count the answers. The first two rows have been done.

1 Finish the tally chart below.

The number of dogs re-homers already have

| Number of dogs | Tally   | Frequency |
|----------------|---|-----------|
| 0              |  |           |
| 1              |   |           |
| 2              |   |           |
| 3              |   |           |
|                | Total   |           |

- 2 When you have finished tallying, count the number of tallies in each row. Write the totals in the last column.

Use the tally chart to answer these questions.

- 3 How many re-homers have only one dog? .....
- 4 How many re-homers have no dogs? .....
- 5 How many re-homers have two dogs? .....
- 6 We must visit any home with two or more dogs before we allow another dog to go there. How many homes must we visit? .....

### Activity 8

These figures show the number of cats re-homed each week during the first half of 2002.

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 3 | 2 | 4 | 1 | 2 | 4 | 2 |
| 1 | 3 | 3 | 1 | 1 | 0 | 1 |
| 0 | 1 | 0 | 5 | 2 | 3 |   |
| 5 | 1 | 2 | 2 | 3 | 0 |   |

- 1 Complete the tally table below.

Cats re-homed each week during the first half of 2002

| Number of cats | Tally | Total |
|----------------|-------|-------|
|                |       |       |
|                |       |       |
|                |       |       |
|                |       |       |
|                |       |       |
|                |       |       |
|                | Total |       |

- 2 In how many weeks were no cats re-homed? .....
- 3 What was the largest number of cats re-homed in any one week? .....

## A picture is worth a thousand words

### Activity 9

Here are the results of our survey of how many dogs people already own.

Fourteen people do not own a dog, three people own one dog, two people own two dogs, and one person owns three dogs.

You can use a table to make the figures easier to read.

Results of the dog owner survey

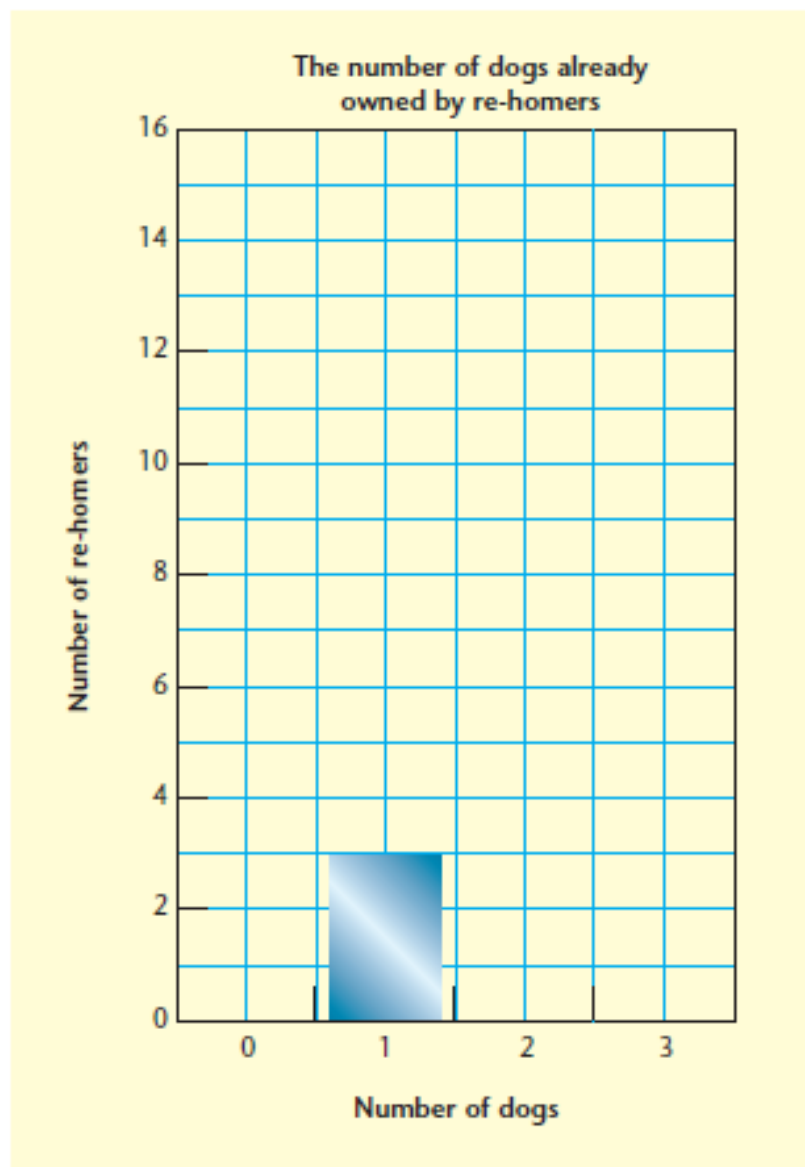
| Number of dogs   | 0 | 1 | 2 | 3 |
|------------------|---|---|---|---|
| Number of owners |   | 3 |   |   |

Put the rest of the results into the table.

### Activity 10


I decide to use a bar chart to show the results of how many dogs re-homers own already.

Use the information in the table in Activity 9 to finish the bar chart.





### Activity 11

I decide to draw a pictogram. I think it is a good way to show my information.

The first thing to do is to decide how I can show the people. I think stick people are easy to draw. I can use a stick person to show two people .

How many dogs do re-homers already have?

| Number of dogs | Re-homers   |  |  |  |  |  |  |
|----------------|---|--|--|--|--|--|--|
| 0              |  |  |  |  |  |  |  |
| 1              |   |  |  |  |  |  |  |
| 2              |   |  |  |  |  |  |  |
| 3              |   |  |  |  |  |  |  |

| Key   |                           |
|---|---------------------------|
|  | represents<br>2 re-homers |

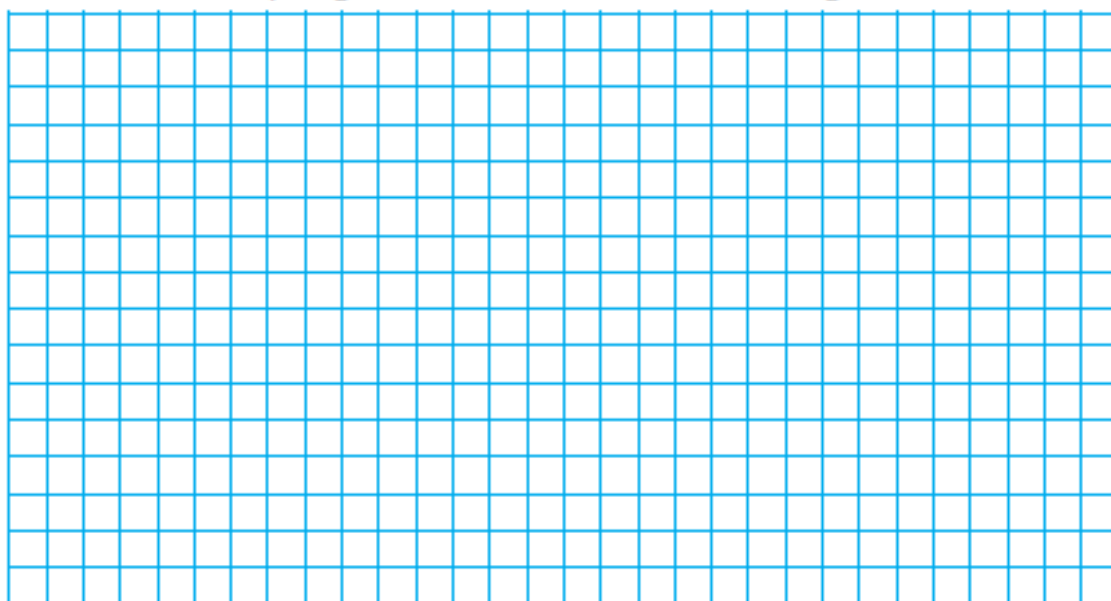
Complete the pictogram.

### Activity 12

The numbers of rabbits already owned by people re-homing a rabbit are shown in the table.

| Number of rabbits owned | 0  | 1 | 2 | 3 |
|-------------------------|----|---|---|---|
| Number of re-homers     | 10 | 5 | 2 | 3 |

Draw a bar chart or pictogram to show this information on the grid below.



## Activity H1

People come to the animal shelter when they are looking for a pet. They want to give a new home to an animal that has no home. If you are looking for a new pet, you need to know when the animal shelter is open. Here are the opening times.

| Day       | Opening times        |
|-----------|----------------------|
| Monday    | 12:00 noon – 4:00 pm |
| Tuesday   | [Closed]             |
| Wednesday | 12:00 noon – 4:00 pm |
| Thursday  | 12:00 noon – 4:00 pm |
| Friday    | 12:00 noon – 4:00 pm |
| Saturday  | 11:00 am – 2:00 pm   |
| Sunday    | 11:00 am – 2:00 pm   |



- 1 On what day is the animal shelter closed?
- 2 What time does the animal shelter open on Mondays?
- 3 What time does the animal shelter close on Thursday afternoons?
- 4 What are the opening times on Saturdays and Sundays?





## Activity H2

Dog pens have a special area for a bed and a large area for the dog to run.



- 1 How long is the pen? ..... metres
- 2 How wide is the run? ..... metres
- 3 How long is the bed area? ..... metres



### Activity H3

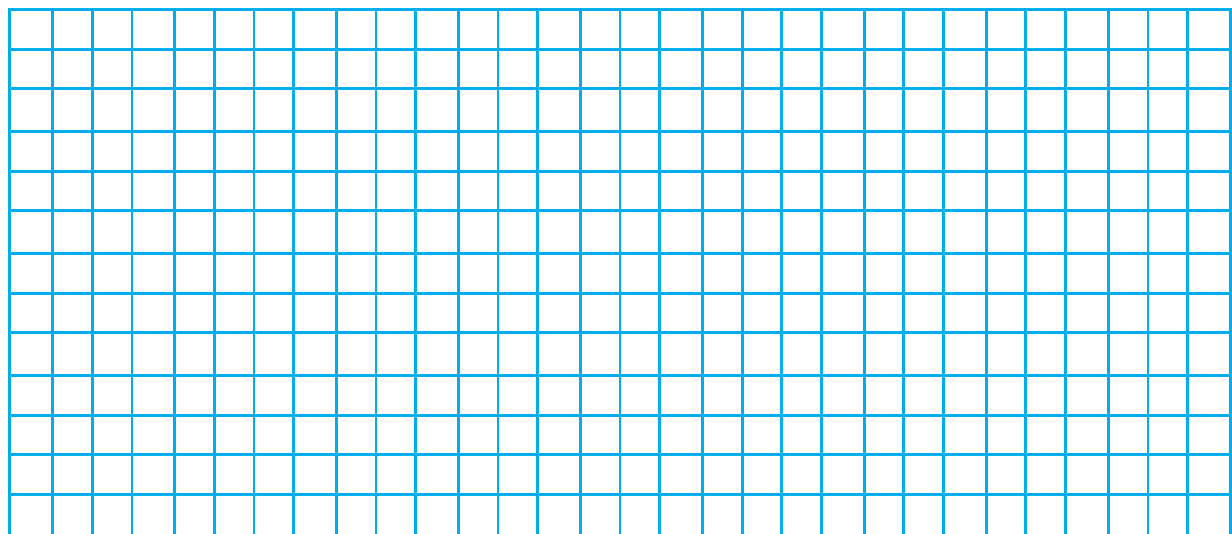
Most visitors come to the animal shelter on Saturday. I decided to count them as they arrived. Some people came on their own (1), others came as a couple (2) or group (3 or more). Here are my results:

2   3   1   2   2   2   1   2   4   3  
3   1   2   4   3   3   2   2   2   2  
2   4   3   3   2   4   3   1   3   2  
1   2   2   3   1   1   3   3   2   1

Visitors to the animal shelter on Saturday

| Number of people<br>in group | Tally | Frequency |
|------------------------------|-------|-----------|
| 1                            |       |           |
| 2                            |       |           |
| 3                            |       |           |
| 4                            |       |           |
|                              | Total |           |

- 1 Tally the results.
- 2 Draw a bar chart to show the number of visitors.



- 3 On separate paper, draw a pictogram to show the number of visitors.

## Activity E1

There is a whiteboard above the reception desk. Each day we write information about all the dogs that are waiting to find new owners so that everyone can see it.

**Saturday: dogs in the shelter**

| Age<br>In years | Sex<br>M / F |
|-----------------|--------------|
| 1               | F            |
| 3               | M            |
| 1               | M            |
| 3               | M            |
| 4               | F            |
| 3               | M            |
| 1               | F            |
| 5               | F            |

| Age<br>In years | Sex<br>M / F |
|-----------------|--------------|
| 3               | M            |
| 2               | M            |
| 2               | F            |
| 1               | F            |
| 1               | F            |
| 4               | F            |
| 1               | F            |
| 5               | F            |

| Age<br>In years | Sex<br>M / F |
|-----------------|--------------|
| 5               | M            |
| 3               | M            |
| 1               | F            |
| 2               | M            |
| 5               | M            |
| 2               | M            |
| 5               | M            |
| 3               | M            |

| Age<br>In years | Sex<br>M / F |
|-----------------|--------------|
| 2               | F            |
| 5               | M            |
| 3               | M            |
| 1               | M            |
| 2               | M            |
| 2               | M            |
| 2               | F            |
| 2               | F            |

- 1 What does M / F mean? .....
  - 2 On what day of the week was the information gathered? .....
  - 3 On separate paper, tally the information into two charts, one for males and the other for females. Tally the dogs by age.
  - 4 Work out how many male dogs and how many female dogs were in the shelter that day.  
Male: ..... Female: .....
  - 5 On separate paper, draw pictograms to show how many male dogs and how many female dogs were in the shelter that day.
  - 6 On separate paper, draw a bar chart to compare dogs by ages and sex.
- Check that your diagrams have all the information needed.



## Check it



### Activity C1

These are the numbers of dogs that were brought into the shelter each week during a 26-week period in 2002.

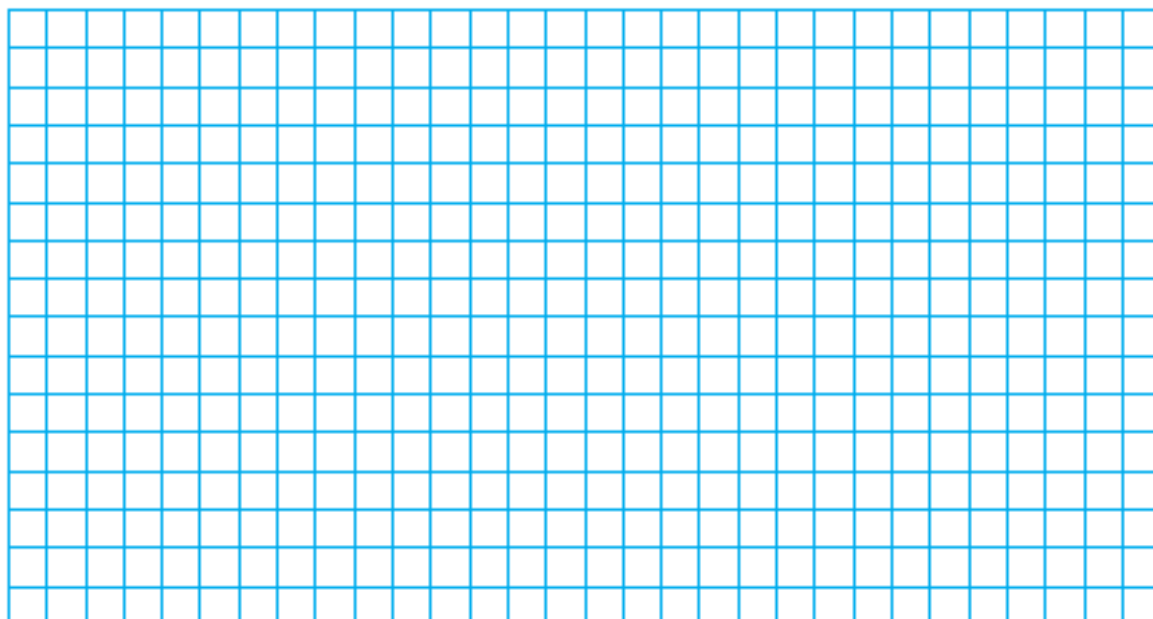
5   3   4   4   6   5   3  
4   2   1   4   4   3   4  
3   3   2   3   5   2  
1   1   3   1   6   1

- 1 Tally the results in the chart.

Dogs brought into the shelter in part of 2002

| Number of dogs | Tally | Frequency |
|----------------|-------|-----------|
| 1              |       |           |
| 2              |       |           |
| 3              |       |           |
| 4              |       |           |
| 5              |       |           |
| 6              |       |           |
|                | Total |           |

- 2 Draw a bar chart to show the number of dogs.





## Activity C2

I am responsible for feeding puppies at the animal shelter. I use this table to work out how much food each puppy needs. To use the table, I need to know the age of the puppy and its weight in kilograms (kg).

Most of the time I feed the puppies with dry food. Sometimes I give them canned food. The food weights are recorded in grams (g).

**Total quantity of canned or dry food per day**

| Up to 3 months     |                                     |                         | 3–6 months         |                                     |                         |
|--------------------|-------------------------------------|-------------------------|--------------------|-------------------------------------|-------------------------|
| Puppy weight in kg | Amount of canned food in 415 g cans | Amount of dry food in g | Puppy weight in kg | Amount of canned food in 415 g cans | Amount of dry food in g |
| 1                  | $\frac{1}{2}$                       | 50                      | 2.5                | 1                                   | 100                     |
| 3                  | 1                                   | 105                     | 5                  | 1.5                                 | 135                     |
| 7                  | 2                                   | 220                     | 15                 | 2                                   | 320                     |
| 13                 | 3                                   | 380                     | 25                 | 4                                   | 490                     |
| 17                 | 4                                   | 475                     | 40                 | 6                                   | 835                     |

- 1 How much dry food do I need to give to a three-month-old puppy weighing 7 kg?

- 2 a How many tins of food do I need to give to a six-month-old puppy weighing 25 kg?

- b What weight is each can?

- c How much is this each day?

- 3 This week I have a litter of four three-month-old puppies. They weigh 3 kg each. How many cans do I need for them?

- a ..... each day

- b ..... each week