GENERAL
SCIENCE TOOLKIT | # Creating Data Tables |

Goal • Practise constructing and interpreting tables.

Think About It

Science is based on observations, both qualitative and quantitative. Because scientists must communicate their observations to others, they often organize their quantitative data (sets of observations) in tables. An example follows.

Number of Species of Parasites Eliminated by a Deworming Medication for Horses

Type of parasite	Number of species eliminated
nematode worms	41
botfly larvae	6
ascaris worms	3
pinworms	2
lungworms	2
neck threadworm	1
tapeworm	1
others	3

The deworming medicine was Zimecterin Gold.

To construct a table to display data from a lab activity, follow the steps below.

1. Display data in columns, not rows.

2. Use the manipulated variable as the heading of the left-hand column. Enter the data for this column in a logical sequence: for example, from smallest to largest.

3. Use the responding variable as the heading of the right-hand column. Sometimes more than one such column is used to express the responding variable, as in the example below.

4. Include any units with the heading at the top of each column in the table. Do not write units with the data in the columns.

5. Give your table a title. The title should reflect the variables, as in "The effect of (the manipulated variable) on (the responding variable)." For example, "The Effect of Steroids on Muscle Growth" could be a title for a table that shows the results of a study on the effects of metabolic steroids on muscle development.

6. Use a pencil and ruler when constructing tables by hand, or use computer software to quickly and neatly generate tables of data.

What to Do

1. The following table shows some recent data about the amount of genetic material in single cells from different organisms. Study it to see how it illustrates the steps for constructing data tables. Then use the data in the table to answer the questions that follow.

The Amount of Genetic Material in the Nuclei of Cells

Type of cell	Amount of DNA (number of base pairs × 10)	Approximate number of genes
wheat	16 000	50 000
human	3 100	30 000
mouse	2 700	26 250
rice	420	50 000
mosquito	289	14 000
fruit fly	137	14 000
slime mold	34	11 000
baker's yeast	12	6 294
HIV	0.009	9

Note: Geneticists determine the amount of DNA by measuring the number of base pairs that make up the organism's DNA. Numbers given here indicate how many million base pairs there are ($n \times 10$). For example, each wheat cell has 16 billion base pairs that make up 50 000 genetic instructions (genes) while a mouse cell has 2.7 billion base pairs and 26 250 genes.

(a) Do all types of cells contain the same amount of DNA? Explain your answer.

(b) Based on the cells in the table, do animal cells have more genes than plant cells? Support your answer.

(c) Does having more DNA in a cell always result in more genes being present? Support your answer using at least one example.

(d) A set of observations often stimulates questions that could be the basis of further scientific inquiry. Pose a question based on these data that could generate further study about the amount of genetic material in cells.

2. Students measured the effect of dropping a rubber ball from different heights on how high the ball bounced. Their observations were recorded in the following data table. Study the table, and identify how the students erred in several ways to follow the steps for constructing data tables. List the errors in the students' table and, in the space provided, construct a table to display the data properly.

Students' Table   *Your Corrected Table*

Height of bounce	Distance of drop
40 cm	50 cm
8 cm	10 cm
24 cm	30 cm
56 cm	70 cm
80 cm	100 cm

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Errors:

1. _____

2. _____

3. _____

4. _____