

Guide to

Presentation of tables and graphs

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- British Library
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- Department of Trade and Industry [Management Services and Manpower Division (MSM)]
- Her Majesty’s Stationery Office
- Institute of Information Scientists
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- Institute of Scientific and Technical Communicators
- Library Association
- London College of Printing
- Periodical Publishers’ Association
- Science Museum Library
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The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Open University
- Royal College of Art
- Royal Society
- Royal Statistical Society
- School Curriculum Development Committee
- University of Reading

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Foreword

This British Standard has been prepared under the direction of the Information and Documentation Standards Policy Committee. It supersedes DD 52:1977, which is withdrawn.

This British Standard gives general information about the presentation of the simpler forms of table and graph. It is not concerned with specialist work and complex forms of presentation. It should help those engaged in the design of tables and graphs for general use, whether in government, business, research or the media, to choose a suitable form of presentation and to use it well.

Some kinds of information are easier to understand if they are presented in tabular or graphic form, rather than continuous prose, but such forms of presentation can be confusing. The choice of form will depend on what the originator wishes to communicate and what the reader needs to know.

Since DD 52 was published, changes in technology, in particular the increasing use of VDU screens, word processors, personal computers and desk-top publishing systems have impacted on the presentation of information and now allow the originator a greater freedom of design than the conventional typewriter. It is hoped that this standard will help originators, such as editors, designers and keyboard operators, to make the best use of that freedom of design.

The presentation of information on VDU screens has been taken into account in the preparation of this standard as far as the constant changes in VDU technology allow.

For further information on methods of presenting information in tabular or graphic form, see the bibliography given in Annex A.

Although this standard recommends consistent forms of presentation throughout a document or group of documents, various different forms of presentation are used for the illustrations in the guide itself to show the range available.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 24, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard gives guidance on methods of presenting information in tabular or graphic form in ways that allow the reader to extract information quickly and easily.

The standard applies to quantitative information in general (including ways of showing the relation between different items), timetables and simple lists. It does not apply to specialist information that may require presentation according to the conventions of a particular discipline.

The standard applies whether information is to be presented on paper or on a VDU screen.

2 Normative references

This British Standard incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this British Standard only when incorporated in it by updating or revision.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1

axis

a straight line used for reference in a graph, the *X* axis being horizontal, the *Y* axis vertical and the *Z* axis orthogonal to the other two

3.2

bar graph

a form of presentation in which rectangles represent the quantity of each category shown

3.3

cell

a unit of information within a table (see Figure 1)

3.4

column

a vertical array of cells (see Figure 1)

3.5

data line

a line joining points within a data set

3.6

data point

a point representing an item of information plotted on a graph

3.7

data set

a collection of related data assembled for presentation in graphic form

3.8

graph

a diagram showing the relation between two or more quantities or variables

3.9

line graph

a graph that uses a line to show the relation between two or more variables, measured along a pair of axes

3.10

lining numerals

numerals that align at top and bottom, as in the following:

1234567890

3.11

non-lining numerals

numerals that vary in height, with some that extend below the base, as in the following:

1234567890

3.12

row

a horizontal array of cells (see Figure 1)

3.13

rule

a straight line

3.14

table

a list of facts, numbers, etc., systematically arranged in columns and rows (see Figure 1)

Row title	Multi-column heading				
	Column heading ¹⁾	Multi-column heading			Computed column heading
Row heading	cell	cell	cell	cell	cell
Subtitle Row heading	cell	cell	cell	cell	cell
Computed Row heading	cell	cell	cell	cell	cell

¹⁾The horizontal alignment of this heading depends on the logical relation of the information with that in the other columns. Sometimes it will need to be aligned with the lower column headings if the information is at that level in the hierarchy.

Figure 1 — Terms used for the constituents of a table

4 Basic considerations

4.1 Choice of form

4.1.1 General

The prime considerations in choosing whether to present data in tables or graphs should be the reader's convenience and the use to which the data will be put. In general, tables are preferable for data with a wide range and data from which readings will be taken. Graphs are preferable for showing trends or relations that would be difficult to detect within a table.

4.1.2 Advantages of tables

The advantages of tables are that they:

- a) can hold many data cells;
- b) allow numeric data to be extracted easily and accurately;
- c) can accommodate wide ranges of data;
- d) are effective where data cells need localized comparison.

4.1.3 Disadvantages of tables

The disadvantages of tables are that they:

- a) do not always make trends visually apparent;
- b) can be off-putting to the reader, particularly, if they are large.

4.1.4 Advantages of graphs

The advantages of graphs are that they:

- a) can express quantities as shapes that facilitate comparison;
- b) facilitate the understanding of numerical data;
- c) show trends well.

4.1.5 Disadvantages of graphs

The disadvantages of graphs are that they:

- a) make comparison difficult if certain shapes are used;
- b) can make the extraction of exact quantities slow or impossible;
- c) can bias the inferences drawn, by the form of presentation;
- d) cannot easily present data with wide discrepancies of scale.

4.2 Perceptual principles

Certain general perceptual principles that govern the arrangement of related information apply to tables and graphs. Simple methods of presentation should be chosen. Items of information tend to be seen as related if they are displayed close together, are aligned, are given the same graphic treatment (e.g. colour or shading) or share the same enclosed space. Information should not appear cluttered.

4.3 Positioning

Tables and graphs should appear near the related text and in the same orientation if practicable. Any that are mentioned more than once should appear near the first reference to them.

4.4 Organizing information to suit the medium

4.4.1 VDU screens

Tables and graphs can be difficult to understand if they are larger than the window available for viewing them on screen. Where possible, any table or graph to be displayed on a VDU should be designed to fit within the area of the screen or window. If necessary, the information should be restructured so that it can be presented in several smaller displays, each clearly related to the others but coherent on its own. The content will suggest the best method of division. Sometimes an overview should be provided from which a reader can select an area for detailed display.

4.4.2 Projected images

If a table or graph is to be displayed as a slide or overhead projection transparency, the presentation should be simple and uncluttered to enable the audience to read and comprehend the information in the time the speaker allows. A table or graph designed for a printed document is often too complex for successful projection. It may need redesigning as a series of simpler displays and the amount of information that can be presented may be limited by the need to use letters and numerals large enough to be easily legible when projected.

4.5 Legibility

4.5.1 Printed images

Letters and numerals should be large enough to be easily legible in their final printed form. Their final size should be checked if the original is to be reduced in size. It may also be necessary to take account of the special characteristics of potential readers (e.g. poor eyesight) or the likely reading conditions (e.g. low light, movement or vibration).

The placing of text or numerals on a shaded or hatched background should be avoided because their legibility could be seriously impaired.

4.5.2 Projected images

Letters and numerals should be large enough to be easily legible at the maximum likely viewing distance. In general, the original will require letters and numerals larger than those used in printed tables or graphs. It is rarely possible to obtain a satisfactory projected image by reproducing a printed version in its entirety, although sometimes part of a printed table or graph can be enlarged to give a legible projected image.

If shades or hatchings are used, they should be designed to reproduce well and be readily distinguishable at the maximum likely viewing distance. Colours can be used to advantage in place of shades and hatchings. If the colours are carefully chosen, text and numerals can be superimposed without loss of legibility.

4.6 Colour

4.6.1 Uses

The use of colour in the presentation of information is increasing as advances in technology (e.g. colour copiers, laser printers, personal computers and computer-generated slides) make it easier to reproduce. Because colour attracts attention, it is used to emphasize, differentiate and relate information, and the reader will try to group elements according to colour, even if that is not intended. Colour should therefore be used with restraint, logically and consistently.

4.6.2 Limitations

Colour will add to the cost of printing. Falsification of information can occur if colours are printed out of register. Before colour is used, the circumstances in which it will be seen should be considered. Colours may be indistinguishable to the colour-blind or to people with normal sight if seen in poor light. Differences between colours may be lost if the information is reproduced in monochrome (e.g. in photocopies or on microfilm). Colour should not therefore be the sole means of emphasis; it should be used in conjunction with typographic variants (e.g. italic, bold) and shading and space. See also 6.7.

4.6.3 Emphasis

If used for emphasis, the impact of a colour will depend on its contrast (light/dark) with the background. The greater the contrast, the greater will be the impact.

4.6.4 Medium

Colour used in the presentation of information should be adapted to suit its medium and should be reconsidered if information is to be transferred from one medium to another. Paper generally provides a light-coloured background against which colours with a dark tonal value are most legible, black giving the strongest contrast. Screens and slides transmit colours of great brilliance, particularly white, yellow, cyan and green, which show well against a dark background.

Speeds	Convenient tabulation				
	$\frac{v}{10^{-3} \text{ m}\cdot\text{s}^{-1}}$	or	$\frac{v}{\text{mm}\cdot\text{s}^{-1}}$	or	$\frac{10^3 v}{\text{m}\cdot\text{s}^{-1}}$
$v = 1 \times 10^{-3} \text{ m}\cdot\text{s}^{-1}$	1		1		1
$v = 2 \times 10^{-3} \text{ m}\cdot\text{s}^{-1}$	2		2		2

Figure 2 — Powers of 10 in headings

4.6.5 Colour coding

If colour coding is used to distinguish related pieces of information, no one colour should be too prominent or too retiring. All colours should give sufficient contrast with the background. Any coloured area should be large enough for the eye to distinguish the colour. Not more than seven colours should be used in any scheme and not more than four if the reader is required to memorize their significance.

4.7 Powers of 10

When, for example to save space or typing, powers of 10 appear in the headings of columns in tables or in the labels of graph axes, it is essential that the information is presented unambiguously to obviate any possible misinterpretation of the order of magnitude of the quantities recorded. They should be treated according to the ordinary rules of algebra in the same way as other elements, especially quantities and units, in such headings and labels. As an example of applying the principles involved, Figure 2 indicates some convenient ways of tabulating a group of speeds.

5 Tables

5.1 Purpose

Tables should be used to supplement, clarify, summarize or replace text, to avoid repetition or to compare differences or similarities. They may also be used on their own for reference (e.g. timetables). Often two or more simple tables will be clearer than one complex one.

The information should be easy for the reader to use. Some tables are given merely to enable the reader to look up isolated figures. Many are given for a more specific purpose (e.g. as part of a report or article). If the purpose is to show a trend, the organization of the table should be chosen to ensure that the trend is easy to see. If the reader has to compare one column with another, the columns should be close enough to make that visually easy, and there should be column averages or totals to summarize the effect in question.

If the purpose is merely to record a collection of figures, the originator should make that clear. If readers find difficulty in extracting messages from the data, they are unlikely to remember them. The characteristic of a good table is that the main patterns and exceptions are self-evident, at least once they have been explained in the text or caption.

5.2 Message structure

The information in rows and columns within a table should normally be arranged to suit the main purpose of the table, see Figure 3 and Figure 4. If the table is one of a series, information within each table should be presented in the same sequence throughout the series. If the same information is going to several different groups of readers, it may be presented in a different sequence for each group, if that will best serve the reader’s needs.

The numerical trends within a table may be brought out by:

- a) ordering by size;
- b) providing row and column averages, because these give readers reference points that help them to see both the main patterns and the outlying values;
- c) use of space and rules (see 5.8 and 5.12).
- d) rounding numbers.

Methods of presentation that are concise but difficult to understand should be avoided (e.g. the practice of giving one column two different meanings). See Figure 5 b).

5.3 Rounding numbers

Cell entries should, if appropriate and not misleading, be rounded because long numbers are difficult for readers to use. The nature and degree of rounding may be given in row or column headings or in a caption. Whether rounding is appropriate will depend on the nature of the data and the uses to which the information is to be put.

Cities in alphabetic order	Average monthly sales of products			
	A	B	C	D
Belfast	148.5	497.3	29.7	172.3
Bolton	31.3	229.1	25.2	29.3
Coventry	81.5	168.2	141.4	119.6
Derby	110.6	321.3	107.6	129.2
Edinburgh	135.1	326.9	132.1	208.3
Hull	70.3	281.3	70.9	132.0
Leeds	276.8	458.6	223.0	336.2
Plymouth	41.4	244.0	33.2	50.2
Reading	99.4	290.4	94.7	99.3
Sheffield	233.4	420.1	193.6	220.9
Swansea	23.5	227.5	22.7	27.1
Wolverhampton	62.3	226.4	61.8	76.7

NOTE This arrangement provides rapid access to particular cells, which makes it easier to find the sales figures for any particular city and product; space inserted every fifth line aids the scanning of the rows (see 5.8). It is difficult, though, to see any general patterns, trends and exceptions.

Figure 3 — Alphabetic arrangement