

Basic document structure

Here's the skeleton of a \LaTeX document. These three lines are *compulsory*: your document will not work without them:

```
\documentclass{article}
  your preamble goes here (extra setups, if any)
\begin{document}
  your document text goes here
\end{document}
```

- ☞ The document class name must be one of book, article, or report, or one you have installed yourself (eg ucthesis, memoir, etc).
- ☞ There are paper size options a4paper (210 mm×297 mm) and letterpaper (8½"×11") and others (eg a5paper).
- ☞ There are base type size options 10pt (the default), 11pt, and 12pt.

Front matter

The **preamble** is where you specify any extra **packages** (\LaTeX plugins) such as typefaces or special formatting requirements, and where you put any changes to standard features.

```
\documentclass[a4paper,11pt]{report}
\usepackage{charter,graphicx}
\setlength{\parindent}{1em}
\begin{document}
\title{your document title}
\author{your name}
\date{date of publication}
\maketitle
\begin{abstract}
  the paragraphs of the abstract go here
\end{abstract}
\tableofcontents
  rest of the document goes here
\end{document}
```

In a typical report or article, the title, author, date, abstract (summary), and table of contents (optional) all go at the start, followed by your text.

Leave a blank line between paragraphs. This does *not* mean you get a blank line typeset, it just means 'start a new paragraph here'. \LaTeX will format your text according to the document class and packages you are using.

Sections and cross-references

Sections get numbered automatically in bold type, and get included in the Table of Contents (if any). Numbering can be turned off selectively. Section heading layout can be modified with the sectsty, titlesec, and other packages.

```
(Preamble, titling, and abstract as above)
\tableofcontents
\section{heading of a section}
  text for the section goes here
...as shown in section \ref{blah}.
\subsection{heading of a subsection}
  text for the subsection goes here
\section{heading of a new section}
\label{blah}  make up a name for the label
  text for the section goes here
\end{document}
```

For cross-references, use `\label{...}` to label the target and `\ref{...}` and/or `\pageref{...}` to refer to it. Make up the label values: \LaTeX will use them to work out the right numbers to print.

Example: ...section `\ref{blah}` on p. `\pageref{blah}`. ➡ ...section 3 on p.9.

Typefaces

\LaTeX 's default typeface is Computer Modern. There is a selection of other typeface packages (use them in your Preamble):

Times	mathptmx	Courier	courier
Palatino	mathpazo	Avant Garde	avant
Bookman	bookman	Helvetica	helvet
Charter	charter	Zapf Chancery	chancery
Utopia	utopia	Pandora	pandora
New Century Schoolbook			newcent

Dozens of others are available, including mathematical fonts. To switch to a sans-serif type family (eg Helvetica, Avant Garde), use `\sffamily` in your text. To change font for a word or phrase, use these commands (they can be nested—see below):

Italics	<code>\textit{Hello}</code>	➡	<i>Hello</i>
Boldface	<code>\textbf{Hello}</code>	➡	Hello
Smallcaps	<code>\textsc{Hello}</code>	➡	HELLO
Sans-serif	<code>\textsf{Hello}</code>	➡	Hello
Monospace	<code>\texttt{Hello}</code>	➡	Hello

Example: `\textit{\textbf{\textsf{bold ital sans}}}` ➡ **bold ital sans**

Font sizing is automatic for titles, headings, and footnotes. There are named step-size commands (in points, relative to the base size):

<code>\normalsize</code>	10	11	12
<code>\tiny</code>	5	6	7
<code>\scriptsize</code>	6	7	8
<code>\footnotesize</code>	7	8	9
<code>\small</code>	9	10	11
<code>\large</code>	11	12	14
<code>\Large</code>	12	14	17
<code>\LARGE</code>	14	17	20
<code>\huge</code>	17	20	24
<code>\Huge</code>	20	24	28

but you can specify an exact size with `\fontsize{pp}{bb}\selectfont` for any point size (*pp*) on any base-line (*bb*) you need. Group (enclose) the command *and* its applicable text in curly braces to prevent it affecting the rest of the document. For wider line-spacing (eg in theses) use the setspace package. You can also use colour with the  xcolor package and the `\color{colorname}` command.

Lists

There are three basic kinds: **itemized** lists (random order with bullets); **enumerated** lists (in order with digits or

letters); and **descriptive** lists (topic-and-explanation format).

<code>\begin{itemize}</code> <code>\item 1lb Sugar</code> <code>\item ½pt Cream</code> <code>\item Chocolate</code> <code>\end{itemize}</code>	<code>\begin{enumerate}</code> <code>\item Mix together</code> <code>\item Boil to 112°C</code> <code>\item Stir and cool</code> <code>\end{enumerate}</code>	<code>\begin{description}</code> <code>\item[Fudge] is fun...</code> <code>\item[Broccoli] sucks...</code> <code>\item[Exercise] is good</code> <code>\end{description}</code>
• 1lb Sugar • ½pt Cream • Chocolate	1. Mix together 2. Boil to 112°C 3. Stir and cool	Fudge is fun but fattening if made too often. Broccoli sucks, period. Exercise is good for you if taken daily and not to extremes.

You can nest lists inside each other. See packages like paralist and mdwlist to control list formatting.

Tables and figures

Formal tables and figures *float* (change position to fill available space) so they may not be printed where you typed them.

```
\begin{table}
\caption{Mean growth rate and intakes
of supplement, milk, and water for 4
diets.}
\label{dietgrowth}\centering
\begin{tabular}{|l|r|r|r|r|}\hline
&Growth&Supplement&Milk&Water\\
&Supplement&rate&intake&intake&intake\\
&&&(g/day)&(ml/kg$^{0.75}$)&(ml/kg$^{0.75}$)\\\hline
Lucerne &145&450&10.5&144\\
Sesbania&132&476&9.2&128\\
Leucaena&128&364&8.9&121\\
None &89&0&9.8&108\\\hline
\end{tabular}
\end{table}
```

Table 2: Mean growth rate and intakes of supplement, milk, and water for four diets (after Sherington, J, undated)

Supplement	Growth rate (g/day)	Supplement intake (g/day)	Milk intake (ml/kg ^{0.75})	Water intake (ml/kg ^{0.75})
Lucerne	145	450	10.5	144
Sesbania	132	476	9.2	128
Leucaena	128	364	8.9	121
None	89	0	9.8	108

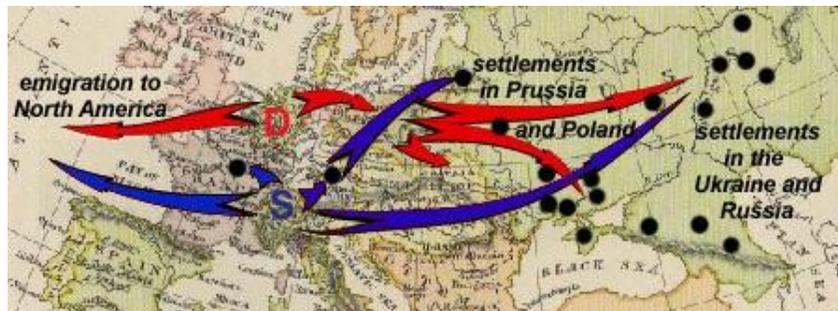
Packages like longtable and array can help with more complex table formats.

For help, see the links on the front and back pages. There is a summary of common commands at www.stdot.org/~winston/latex/latexsheet.pdf and a comprehensive list at computing.ee.ethz.ch/~soft/latex/green/1tx-2.html.

```

\begin{figure}
\caption{Swiss and Dutch Mennonite migrations of the 1700s and 1800s}
\label{langmig}
\centering (graphics must be in EPS format for standard LATEX; JPG, PNG, or PDF for pdfLATEX)
\includegraphics[width=.9\columnwidth]{menno-a}
\\tiny Courtesy of Paul C. Adams, Department of Geography and the Environment,
University of Texas at Austin. \cite{adams}
\end{figure}

```

Figure 1: *Swiss and Dutch Mennonite migrations of the 1700s and 1800s*

Courtesy of Paul C. Adams, Department of Geography and the Environment, University of Texas at Austin. [1]

Footnotes, citations and references

Footnotes are done with a simple command,² see below. Citations using BIB_T_E_X (Patashnik, 1988) are also simple (see [2], §7.4.2) but there are packages capable of more complex formats, especially for journals and publishers. Cross-reference and citation numbers automatically synchronise.

```

Footnotes are done with a simple command,\footnote{Like this.} see below.
Citations using BIBTEX \citeauthoryear{oren} are also simple (see
\cite[§7.4.2]{flynn} but there are packages capable of more complex formats,
especially for journals and publishers.
add the following at the end of your document and create myrefs.bib (see BIBTEX manual [3])
\bibliography{myrefs}\bibliographystyle{apalike}

```

References

- Adams, Paul C. *Linguistic Chaos in Montreal*, www.utexas.edu/depts/grg/adams/chaos.ppt, 2/59, Oct 2006.
- Flynn, P. *Formatting Information*, Silmaril Consultants, 2005, latex.silmaril.ie/
- Patashnik, O. *BIB_T_E_Xing*, T_E_X Users Group, 1988.
- Sherington, J. example table in 'Informative Presentation of Tables, Graphs and Statistics', 4.2, Statistical Services Centre, University of Reading, www.reading.ac.uk/ssc/publications/guides/toptgs.html
- T_E_X Users Group, *Free T_E_X Live software on CD/DVD*, www.tug.org/texlive/

Note. Commercial implementations of T_E_X with business support are available from Personal T_E_X, Inc (PCT_E_X); Blue Sky Research (Textures [Mac]); MacKichan Software, Inc (Scientific Word); Micropress, Inc (V_T_E_X), and TrueT_E_X Software (TrueT_E_X).

The very short guide to typesetting with L^AT_EX

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Description

L^AT_EX is a document preparation system for the T_E_X typesetting program. It enables you to produce publication-quality output with the maximum of accuracy and consistency. L^AT_EX works on any computer and produces PDF documents from standard plain-text input files. It is available both in free (open-source) and commercial implementations. L^AT_EX is ideal for documents of any length, but especially those with complex structure, repetitive formatting, mathematics¹, technical stability, and dimensional accuracy.

Syntax (how to type L^AT_EX commands)

- **All L^AT_EX commands begin with a backslash.**
Example: `\tableofcontents`
- **If a command needs text to work with, it goes in curly braces.**
Example: `\title{Global Warming}\author{George W Bush}`
- **If options are used, they go in square brackets first.**
Example: `\documentclass[a4paper,11pt]{book}`
- **Space after commands *without* braces gets suppressed.**
Example: `Copyright \copyright 2007` ➤ `Copyright ©2007` ✗
To prevent this, put empty curly braces after the command.
Example: `Copyright \copyright{} 2007` ➤ `Copyright © 2007` ✓
- **Curly braces are also used to restrict the scope of effects inside them.**
Example: `Some {\tiny tiny} word` ➤ `Some tiny word`

Creating and typesetting your document

- Create your document using any suitable plain-text editor with L^AT_EX controls, eg *T_E_Xshop* (Mac), *T_E_XnicCenter* (Win), *Kile* (Linux), *Emacs* (all);
- Save the file with a name ending in `.tex` (*never* use spaces in filenames!);
- Use the toolbar buttons or menu items in your editor to typeset and display the document;
- Make any changes needed in your original document and repeat step 3.

Note. This guide shows only a tiny fraction of L^AT_EX's power. For information, visit the T_E_X Users Group (www.tug.org). For help, see the FAQ (www.tex.ac.uk/faq) and the Usenet newsgroup `comp.text.tex`. For packages, use the Comprehensive T_E_X Archive Network (www.ctan.org). For documentation, use the source in the *References* [2].

²Like this.

¹For reasons of space this guide does not cover details of mathematics typesetting.