TECHNICAL REPORT STYLE & FORMAT GUIDE

For

AUTHORS & TYPISTS

JUNE 1971

DEVELOPMENT DIVISION

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MASTER

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DEVELOPMENT DIVISION

Compiled by

Betty G. Reagh

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FOREWORD

The information contained in this style and format guide has been compiled to assist authors and typists in preparation of technical reports and articles for publication.

Special thanks are due Yvonne Turley, Lou Glasper, Tina Lucero, Cathy Stooksberry, and Gil Perkins for their invaluable assistance in preparing this material.

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I. FORMAT

TECHNICAL REPORT STYLE & FORMAT GUIDE

Technical reports are comprised of several basic elements, each possessing distinctive characteristics and serving a specific purpose. These elements usually appear in the following sequence:

FORMAT

COMPLEX

Front Matter

Title Page
Notices
Foreword
Abstract
Summary
Table of Contents
List of Illustrations
List of Tables
Introduction

Main Body

Technical Discussion
Nomenclature
Conclusions
Recommendations

Terminal Matter

Bibliography or Reference Listing
Appendixes

SIMPLIFIED

Front Matter

Title Page
Abstract

Main Body

Technical Discussion
Conclusions and/or Recommendations

Terminal Matter

Reference Listing

Note: *The simplified format is used for the majority of technical reports resulting from work performed on Process Development projects and for the Design Laboratories. All or any part of the complex format may be used for reports requiring more flexible presentation.*

FRONT MATTER

TITLE PAGE

A title page presents the title, date, author's name, and a brief statement explaining the purpose of the project.

NOTICES

Notices are short paragraphs of a proprietary nature; statements concerning restrictions on patent and publishing rights imposed by the company contract.

If there is only a single short notice, it should be typed in block paragraph style at the bottom of the title page. If there are several notices, they should be typed on a page immediately following the title page.

FOREWORD

A foreword may be used to present information relating to the report, its subject or its preparation, when such information cannot suitably be included elsewhere. It may include the names of individuals or organizations participating in or contributing to the work; it may indicate that the report is one of a series or has been prepared in several parts. The foreword usually gives the contract authorization and administrative aspects of the work. When the author is to be credited, a sentence to this effect would be included in the foreword.

ABSTRACT

The abstract is a brief synopsis of the content of a report. Its purpose is to acquaint the reader with the subject matter so that he may determine whether it contains information of value to him.

An abstract should state the subject, the basic problem, the significant findings, and any resulting conclusions or recommendations.

The abstract should not contain any ideas or conclusions not included in the text.

SUMMARY

The summary tells a reader, in more detail than is possible in the abstract, the significant facts presented in the text, results and how they were obtained, and the conclusions derived. Its purpose is to give those who cannot afford the time to read the entire report the significant information concerning the work being reported. As with the abstract, no information is given in the summary that is not also in the text.

Note: *Lengthy Process Development Reports require a complete summary.*

CONTENTS, ILLUSTRATIONS, AND TABLES

The listings of contents, illustrations, and tables are used in complex reports.

Where possible, figures and tables are placed throughout the text immediately following their initial reference.

Tables and Listings

A table is a concise and orderly form for the presentation of data. The appearance of tables should be as simple as possible to facilitate analysis of the data. Tabulations in text take the form of simple listings (one or two columns). Tabular listings without titles are placed immediately following the paragraph or sentence introducing them. Tables with titles are usually placed on the same page with their text reference or on the page immediately following. (Refer to Section III.)

Figures

Figures consist of photographs, sketches, curves, etc. (Refer to Section III.)

INTRODUCTION

The introduction is a means of preparing the reader for the information which follows. It should contain whatever is necessary to acquaint the reader with the background and history of the material discussed in the text. It may state the scope of the project and what limitations are imposed. Although the introduction should not tell what is in the text, it may define terms or explain the organization of materials presented.

MAIN BODY

BODY OF TEXT

The body of text contains detailed information about the subject being reported. The number of major sections is determined by the requirements of the subject matter. The headings should clearly relate to the subject, and they should indicate logical subordination of the topics discussed.

Heading Systems

Text headings call attention to significant changes in subject matter. They serve a dual role: as titles, headings state the subject of the following paragraphs, enabling the reader to tell whether information he is searching for is likely to be there; and as transition devices, headings indicate whether or not the following topic is subordinate to the preceding topic. (Refer to Section II.)

Nomenclature

If a publication contains a large number of mathematical symbols or uncommon technical terms, it should include a nomenclature list or glossary to explain them, eliminating the need for defining these terms in the text or in footnotes. The nomenclature list normally precedes or follows the body of the text. However, it may be integrated with a particular section of the text if all of the terms appear there or if complexity requires close reference.

Nomenclature is listed in a two-column format, with the symbols aligned on the left-hand margin and the definitions in a wide reading column on the right. Units of measure may be listed in a third column or may be incorporated as part of the definitions. (Refer to Section VI.)

TERMINAL MATTER

BIBLIOGRAPHY OR REFERENCE LISTING

A bibliography is a list of sources of information pertinent to the subject matter of the publication. If the bibliography contains only entries that are referenced in the text, it may be titled "References." (Refer to Section IV.)

APPENDIXES

Additional or supplementary material, having some contributory value but not essential to completeness, should be sub-joined to a document as an appendix. Examples of material that might be appended include portions of other reports, specification requirements, conversion tables, and detailed mathematical analyses.

An appendix is always placed at the end of a technical report. The style and format of an appendix should be consistent with the basic report except when the appendix is a previously published document, reproduced in its original form.

A single appendix in a publication carries only the designation "APPENDIX." Two or more appendixes are designated alphabetically, such as "APPENDIX A," "APPENDIX B." Titles may follow the appendix designation, or appear beneath it. All appendixes should be listed in the table of contents.

Figures, tables, and equations should be numbered separately from the text, such as "A-1."

II. HEADING SYSTEMS

H E A D I N G S

PRIMARY OR FIRST ORDER HEADING

*(Arrange a long centered heading in inverted pyramid form.
All caps - no underscore)*

SECOND-ORDER HEADING

(Left margin - all caps - no underscore)

Third-Order Heading

(Left margin - initial cap and underscore)

Fourth-Order Heading

(Indent 5 spaces from left margin, initial cap - no underscore)

Fifth-Order Heading

*(Indent 10 spaces from left margin, initial cap, underscore.
Underscore this run-in heading, and follow it with a period and
two spaces. Continue the first sentence of the paragraph on the
same line.)*

Avoid a dangling heading, that is, a heading that appears by itself at the end of a page. Each level or order of heading must have at least two lines of text with it. If there is not enough space at the end of a page for both (heading and text), start the heading on the next page.

III. ILLUSTRATIONS AND TABLES

FIGURES

1. A figure title is also called a figure caption. Type the word "Fig.," the Arabic number, and the title below the illustration. A title should not extend beyond the width of the figure.

Fig. 3. Typical Chemical Reactor

2. Number the figures consecutively throughout the report.
3. Place each figure as close as possible to the text it supports and following the point where it is first mentioned.
4. A figure caption may be a short topical phrase, a sentence or two, or a paragraph. Center a one-line title below the figure. Arrange paragraph captions in block paragraph form to the width of the figure.

Fig. 2. (a) Plot of total output current vs. arc voltage for various source pressures. (b) Arc current vs. arc voltage for various source pressures.

TABLES

The following general rules should be observed in preparing tables for final typing:

1. Center the table title over the table. The title is preceded by the word "Table" and the table number, followed by a period.

Table I. Comparison of Type Weight and Type Size

2. Use column headings to avoid repetition. A heading is assumed to refer to all entries in the column below it. Initial letters of major words in headings are capitalized. Units of measure should be lower case and in parentheses. Center headings over columns, and align them horizontally on the bottom line.
3. Use standard abbreviations and symbols to conserve space. (Refer to Section VI.)
4. Leave a space when an entry in a column is omitted, but a dash or a hyphen may be used when the omission occurs in a table that has a high density of data.
5. Divide a tabulation into major parts, when necessary, but using upper case, centered subtitles. If column headings apply to all subdivisions of the table, they appear above the initial subtitle and are not repeated. If column headings differ for the various subdivisions, they appear below each subtitle.
6. Use footnotes when it is necessary to clarify data entries, column headings, or table titles. Use an asterisk (or if more than one or two, use *script* a, b, c, etc., and one-half space above line. (Refer to Section IV.)
7. Capitalize the first word only in column entries that contain text rather than numbers.
8. Center two-column numerical tabulations on a page; allow 3/4 to 1 inch of space between columns. Adjust tabulations with more than two columns so that the space between columns is approximately equal.
9. Align reading column entries on the left.
10. Align all numbers in a column on their decimal points if they are the same units of measure. When the numbers in a column represent different units of measure, align them on the left.

11. When a column consists of a double row of numerals connected by a mathematical symbol or by the word "to," align the symbol or the word.
12. Place plus, minus, and plus-or-minus signs before their corresponding numbers with a space.
13. Use dollar signs with the top entry in a column and with all entries that are totals or subtotals; the signs are aligned.

IV. REFERENCES, BIBLIOGRAPHY, FOOTNOTES

REFERENCES, BIBLIOGRAPHIES, FOOTNOTES

REFERENCES AND BIBLIOGRAPHIES

A report containing no more than three references may be listed at the bottom of the page as follows:

This equation has been successfully used by Hantel and Davis(1) for the calibration...

(1)Hantel, L. W., and W. C. Davis, *Spherical Explosions in Water, Fifth Symposium on Detonation, Pasadena, CA 1970.*

A report containing more than three references or a bibliography will be referenced as shown above in the text, but will be arranged by number on a separate page located at the back of the report and titled "References" or in some cases "Bibliography."

FOOTNOTES

An explanatory statement is not considered an actual reference and should be footnoted at the bottom of the page as follows:

Two compositions were formulated: one was 98 weight percent untreated, Superfine PETN^a in terminated, linear polybutadiene; the other was 97/3. Both compositions were mixed in toluene to 40 weight percent solids. A novel low-pressure spray system was employed. This system is a simple siphon, pressure jet, trigger valve combination mounted on a 15-ounce can of Freon gas used for recharging automobile air-conditioning systems.^b

^aProduct of Hercules Powder Co., Wilmington, Delaware.

^b"Spray Tool" No. 8011, complete with power pack ML-5-22805 (WEP) distributed by Crown Industrial Products Co., Hebron, Illinois.

Footnotes used in tables and illustrations may be indicated by asterisks or any other convenient symbols. Arabic numerals should not be used as they are sometimes confused with exponents.

FOOTNOTE OR REFERENCE CONSTRUCTION

Single-space, double-space between items. Use quotation marks with titles of publication parts; underline titles of complete publications.

ONE AUTHOR	1. Erwin M. Keithley, <u>A Manual of Style for the Preparation of Papers and Reports</u> (Cincinnati: South-Western Publishing Co., 1959), p. 7.
TWO AUTHORS
(AND EDITOR)	2. E. Jerome McCarthy and J. A. McCarthy, <u>Integrated Data Processing Systems</u> , ed. Durward Humes (New York: John Wiley & Sons, Inc., 1966), p. 74.
IBID. ^a	3. <u>Ibid.</u> , pp. 111-113.
THREE AUTHORS	4. A. B. Carson, Arthur E. Carlson, and Clem Boling, <u>Secretarial Accounting</u> (8th ed.; Cincinnati: South-Western Publishing Co., 1967), p. 59.
FOUR OR MORE
AUTHORS	5. M. E. Jansson et al., <u>Handbook of Applied Mathematics</u> (4th ed.; New York: D. Van Nostrand Co., Inc., 1967), p. 42.
UNPUBLISHED
MATERIAL	6. Paul S. Greenlaw, <u>The In-Basket as a Training Instrument</u> (Mimeographed report, Dayton Rubber Company, 1959), p. 8.
OP. CIT. ^b	7. Carson, <u>op. cit.</u> , p. 63.
GOVERNMENT
AGENCY	8. U.S. Treasury Department, Internal Revenue Service, <u>Your Federal Income Tax</u> , Publication No. 17 (Washington: U.S. Government Printing Office, 1964), p. 87.
MAGAZINE
ARTICLE	9. "Why Whirlybirds Are Taking Off," <u>Business Week</u> (April 20, 1968), pp. 100-120.
ARTICLE FROM
A BOUND VOLUME	10. John T. Dunlop, "New Forces in the Economy," <u>Harvard Business Review</u> (Boston: Graduate School of Business Administration, Harvard University, 1968), Vol. 46, No. 2 (March-April 1968), p. 121.
NEWSPAPER
ARTICLE	11. "Factory Orders Surged by 3.4% During March," <u>Wall Street Journal</u> (May 6, 1968), p. 5, col. 1.
LOC. CIT. ^c	12. Keithley, <u>loc. cit.</u>

^aIbid. refers to the immediately preceding source.

^bOp. cit. refers to a different page of a previous citation.

^cLoc. cit. refers to the same location of a previous citation with intervening footnotes.

BIBLIOGRAPHY CONSTRUCTION

Invert the order of only the first author's name. Give page references only for citations of parts of publications. Omit parentheses around publication facts except for periodicals.

- THREE AUTHORS Carson, A. B., Arthur E. Carlson, and Clem Boling. Secretarial Accounting, 8th ed. Cincinnati: South-Western Publishing Co., 1967.
- ARTICLE FROM A BOUND VOLUME Dunlop, John T. "New Forces in the Economy," Harvard Business Review (Boston: Graduate School of Business Administration, Harvard University, 1968), Vol. 46, No. 2 (March-April 1968), p. 121.
- NEWSPAPER ARTICLE "Factory Orders Surged by 3.4% During March," Wall Street Journal. (May 6, 1968), p. 5, col. 1.
- UNPUBLISHED MATERIAL Greenlaw, Paul S. The In-Basket as a Training Instrument, a mimeographed report by the Dayton Rubber Company, 1959.
- FOUR OR MORE AUTHORS Jansson, M. E., et al. Handbook of Applied Mathematics, 4th ed. New York: D. Van Nostrand Co., Inc., 1967.
- ONE AUTHOR Keithley, Erwin M. A Manual of Style for the Preparation of Papers and Reports. Cincinnati: South-Western Publishing Co., 1959.
- TWO AUTHORS (AND EDITOR) McCarthy, E. Jerome, and J. A. McCarthy. Integrated Data Processing Systems, edited by Durward Humes. New York: John Wiley & Sons, Inc., 1966.
- GOVERNMENT AGENCY U.S. Treasury Department, Internal Revenue Service. Your Federal Income Tax, Publication No. 17. Washington: U.S. Government Printing Office, 1964.
- MAGAZINE ARTICLE "Why Whirlybirds Are Taking Off," Business Week. (April 20, 1968), pp. 100-120.

V. CAPITALIZATION AND PUNCTUATION
NUMBER TERMS
MATHEMATICAL EXPRESSIONS
MISCELLANEOUS TYPING STANDARDS

CAPITALIZATION AND PUNCTUATION

CAPITALIZATION

Capitals are used to indicate the beginning of a statement or to identify a proper noun—a particular person, place, or thing as distinct from a general class. A word that begins a complete formal statement following a colon is capitalized. Titles of publications, their subsections, illustrations, and tables are capitalized, as are headings in text. The rules of capitalization in the following list apply to technical reports.

1. Follow standard practice in capitalizing proper nouns. Common nouns that substitute for proper nouns also should be capitalized: Government is capitalized when referring to the United States Government. To avoid confusion, do not capitalize government, division, or corporation when using them as substitutes for other organizations.

The words "north," "south," "east," and "west" are not capitalized except when they form a part of a recognized noun for a specific area, as in "North Pole," or in the "East."

2. Capitalize all the initial letters for words in titles and captions except prepositions and conjunctions. However, prepositions and conjunctions should be capitalized when they consist of four or more letters, or when they are equally important as other words in the title. When the word "to" is part of an infinitive verb form, it is also capitalized.
3. Capitalize a title immediately preceding a person's name, as in "Lieutenant Fowler," or "Superintendent Allen."
4. Capitalize common nouns used with numbers or letters as references to specific parts of a publication or to parts of an engineering program.

Fig. 27 Phase II

Section II Task A

Reference 9 Table II

5. Follow current practice as indicated in the dictionary or by the manufacturer for capitalizing trade names and equipment named for an inventor. (Check the Condensed Chemical Dictionary for capitalization of chemicals.)
6. Capitalize single letters used as syllables unless the letter is lower case in its original context.

X-ray (a noun)

T-fitting

n modes ("n" referring to an equation symbol)

7. Capitalize every letter in all words in the names of switches, controls, indicators, and switch positions.

The switch is in the OFF position.

8. Capitalize the names of programs.

Atlas-Agenda

Apollo

Hound Dog

Flowshare

9. Capitalize all letters in an abbreviation formed of initials of words in proper names. Examples of words formed by the capitalized initial letters of proper names include:

NASA

National Aeronautics and Space Administration

ALO

Albuquerque Operations Office

LASL

Los Alamos Scientific Laboratory

SLA

Sandia Laboratories, Albuquerque

PUNCTUATION

Punctuation practices vary widely, primarily because the kind of written material dictates the punctuation system that will be most effective. There is considerable variation between a punctuation system that would be acceptable for literary publications and one that would be acceptable for technical applications. The methods of punctuation given here have proven to be the most satisfactory for technical material.

Apostrophe

1. Form the possessive singular of common nouns by adding 's; form the possessive singular of proper nouns ending in "s" by adding an apostrophe only. The possessive pronouns—hers, its, theirs, yours, and oneself—do not have an apostrophe.

the boss's secretary

Burns' diary

2. Do not use the apostrophe in abbreviations formed by deleting letters; however, the apostrophe may be used in contractions formed by deleting letters.

ENGRG, not ENG'R'G

can't

3. Use an apostrophe to form plurals of figures, letters, and words that are treated as nouns.

1920's

PBX's

the why's and wherefore's

Colon

1. Use the colon to introduce a series of items or ideas.

Qualitative analysis has revealed the constituent elements of the mixture: tin combined with fluorine, aluminum as both oxide and hydroxide, and minute amounts of copper salts.

2. Use the colon to introduce any subject specified in a sentence.

The following question will be referred to in the Space Medicine group: What is the tolerance level of an astronaut during the period of maximum dynamic pressure?

3. Use the colon to express proportions with numerals.

A ratio of 5:3:1

4. Use the colon to introduce quotations.

A famous writer once said: "Editorial latitude is not license for undisciplined writing."

Comma

1. Use commas to separate the elements in a series, and always place a comma before the final conjunction. The technical meaning of a sentence can be altered if this practice is not observed. A sentence such as

"the values of X, Y, and Z are unknown"

has an obviously different meaning from

"the values of X, Y and Z are unknown"

2. Use commas before and after parenthetic expressions. In addition to words and phrases that are not structurally essential, parenthetic expressions include (1) most appositives; (2) the abbreviations, etc., e.g., i.e., and viz.; (3) nonrestrictive subordinate clauses; (4) introductory phrases and (5) subordinate clauses preceding a main clause.

Colonel Fowler, the Air Force representative, reviewed the new project.

These words are employed in every official Division document, viz., reports, proposals, promotional literature, and special presentations.

The firing site facility, which will be completed in August, will be located at Pantex Plant.

Speaking of publications, you'll enjoy reading the company newspaper.

When the facility is completed, it will accommodate boosters in the million-pound thrust range.

3. Place a comma before the coordinating conjunction in compound sentences.

Logical arrangement of material is important, but even good organization is useless without clear writing.

4. Place a comma in numerals used in text if the numeral contains five or more digits; do not use a comma in numerals containing only four digits.

The maximum altitude was 20,000 feet; the minimum altitude was 5000 feet.

5. Place a comma in numerals containing four digits if they appear in a vertical column with other numerals requiring commas.

2,000

50,000

3,000

280,000

Dash

The dash indicates a sharp break in the sentence. It may be used to create special effects, such as dramatic emphasis, but it should not be overused. The dash should never be combined with a comma, a colon, or a semicolon. Following are the primary uses of the dash in formal technical writing.

1. Use the dash to replace parentheses when the parenthetical material requires a relationship to the main idea of the sentence that is closer than would be indicated by parentheses.

The principal problems confronting man in outer space—weightlessness, high vacuum, radiation, acceleration, and deceleration—have significant biological implications.

2. Use the dash to summarize, emphasize, or contrast a previous statement in a sentence.

Extreme temperatures are necessary for the operation—temperatures well above 700 C.

3. Use the dash to introduce an appositive or further explanation.

The technician will be required to perform various work tasks—from routine operations to emergency maintenance.

Hyphen

Hyphens are used to form compound words and to connect prefixes and suffixes to certain words. The use of a hyphen to break a word at the end of a line is considered a typographical problem rather than a writing problem.

Hyphenated Compounds

1. Use the hyphen to join two normally separate functions.

secretary-treasurer

fighter-bomber

French-German

2. Use the hyphen to form nouns or adjectives from verbs that carry a preposition or adverb with them.

take-off

built-up

go-between

When such words pass into widespread usage, they often lose the individual accent on the second element and become a solid compound, as in "setup" and "overall."

3. Use the hyphen to form a compound adjective from two words that function together as a single adjective modifying a noun.

long-term basis

low-altitude flight

well-designed component

third-stage vehicle

Omit the hyphen if the words follow the noun, or if the first word ends in "ly," as in "newly designed component."

4. Hyphenate compounds beginning with "self."

Self-contained life support system

5. Hyphenate prepositional phrases immediately preceding the word they modify.

A three-to-one ratio

6. Hyphenate more than one term theoretically joined to the same word.

First-, second-, and third-stage firings

Prefixes

Prefixes are usually joined to a word without any hyphenation. The following rules indicate the few exceptions when a hyphen should be used.

1. Hyphenate prefixes and suffixes added to an idea expressed in more than one word.

ex-design-engineer

Stone-Age-like

2. Hyphenate a prefix and a word beginning with a capital letter.

un-American

pro-European

3. Hyphenate a prefix if it will otherwise be misunderstood. "Ex-" meaning "former" always comes under this rule, as do newly coined words and double prefixes.

recreation

re-creation

ex-president

un-American

un-un-American

non-negative

4. Hyphenate prefixes when two identical vowels come together, except with one-syllable prefixes ending in e or o.

multi-investment

tri-industrial

reentry

cooperation

Parentheses

The use of parentheses for enclosing parenthetical expressions requires no explanation. A parenthetical expression within a sentence and enclosed in parentheses should be punctuated exactly as if the expression stood alone, except that the final mark is omitted. Conversely, a sentence containing an expression in parentheses is punctuated as if the parenthetical expression were absent. A comma is rarely used before the first parenthesis.

Period

The standard grammatical rules governing the use of periods are so well known that it is unnecessary to repeat them here. The practices that follow indicate special situations when the period should be omitted.

1. Do not use a period after a figure or table title; but separate the figure or table number from the title with a period.

Fig. 3. Temperature Control Schematic

2. Do not use a period after an entry in a listing unless the entry is a complete sentence.
3. Do not use a period after a heading in text unless the heading is run in with the text.
4. Do not use periods after tabular column headings or after explanatory phrases in illustrations.

Quotation Marks

Quotation marks pose no special problem in technical reports. They are primarily used to set off titles of other reports or proposals. They should be combined with other punctuation marks as follows:

1. The period and comma always go inside the closing quotation mark regardless of their relation to the material quoted.

A final report, "Chemistry of Septa Materials," was presented at the symposium.

A brief summary of the publication is given in Section I, "Publications Procedures."

2. The question mark and exclamation point are placed inside the quotation marks if they are part of the quotation. If they are not part of the quotation, they go outside the quotation marks.
3. The colon and semicolon are always placed outside the quotation marks.

The first volume is entitled "Program Management"; it identifies key project personnel.

Ellipsis Marks

Ellipsis marks consist of three periods; they are used to indicate that words are missing from a quotation. If the ellipsis occurs at the end of a sentence, a period must be added, making a total of four periods.

"Difficulties encountered by fearless but ill-prepared pioneers... could have been anticipated and safeguards taken...."

NUMBER TERMS

Number terms include (1) ordinal numbers such as "second," "third," and "fourth;" (2) cardinal numbers such as "two," "three," and "four;" (3) fractions; and (4) related words (next, last, other, few, many, several, couple, dozen, gross).

The ordinal numbers are primarily adjectives and qualify singular nouns, as in "the third stage." An ordinal followed by "of" and a plural noun, as in "the third stages," is awkward and usually has the same meaning as "the third stage."

Cardinal numbers also are primarily adjective, but they qualify plural nouns, as in "the three stages," however, when they are used to indicate part of a specified group, they must be treated as nouns and followed by the preposition "of," as in "three of the stages."

A hyphen is used in compound ordinals and cardinals, such as "twenty-first" and "twenty-one."

Arabic Numerals

Normally, an Arabic numeral should not be used at the beginning of a sentence. The rules that follow define usage for Arabic numerals in most technical reports:

1. Use numerals in text for explicit numbers greater than ten; numbers from one through ten should be spelled out. Where several numbers, some greater and some less than ten, appear in a sentence, use numerals exclusively.

12 parts

ten flights

11 capacitors, 8 tubes, and 27 feet of wire

2. Spell out numbers used in succession where confusion may occur.

On August 12, eleven transformers burned out.

3. Spell out round-number approximations.

about thirty times a minute

nearly five hundred miles

4. Use numerals for exact numbers associated with units of measure and for all numbers used with abbreviations of units of measure.

640 knots

3 feet

7 F

nearly 100 psi

5. When a compound adjective begins with a numeral and is preceded by another number, spell out one of the two numbers.

Twelve 6-foot cables

12 six-foot cables

6. Use numerals for all decimals. Place a zero before the decimal point to prevent misreading.

0.58 gram

0.34 inch

7. Use a plural noun with numerals that include tolerances.

50 $\pm$ 3 grams

0.1 $\pm$ 0.005 ohms

5 $\pm$ 0.1 ohms

8. Do not follow a spelled-out number by a numeral in parentheses.

Wrong: eight (8) missiles

Correct: eight missiles

9. Use the word "to" or "and" rather than a hyphen or dash to indicate a spread of values expressed by numerals. However, hyphens may be used in tabular material to conserve space.

from 10 to 15 feet

between 15 and 20 psi

Fractions

The use of fractions in technical reports should conform to the rules that follow:

1. Express fractions in Arabic numerals when used with units of measure.

$\frac{3}{4}$ gram

$\frac{6}{10}$ second

2. Use either a singular or plural verb with a fraction, depending on whether the fraction is thought of as a unit or as a certain number of a group.

Three-fourths of the surface of the earth is sea.

Three-fourths of the people are illiterate.

3. Use one hyphen in a fraction, but not two.

one-twentieth

one twenty-fourth

POWERS OF TEN

Numbers and quantities in many scientific fields are often exceedingly large or extremely small, and it is more convenient to express such numbers as powers of 10, in which a superscript number indicates total zeros. For example, it is easier to read, and to type as well, 6×10^{21} (meaning 21 zeros), than 6,000,000,000,000,000,000,000. Negative superscripts are used to express small quantities, where, for example 2×10^{-8} is 0.00000002.

Several powers of 10 are given in the following tabulation:

$10^3 = 1000$	$10^{-1} = 0.1$
$10^2 = 100$	$10^{-2} = 0.01$
$10^1 = 10$	$10^{-3} = 0.001$
$10^0 = 1$	$10^{-4} = 0.0001$

METRIC SYSTEM

Prefixes in the Metric System

A prefix is combined with any base unit to designate value of that particular unit. For example the prefix *kilo* means 1000 times the unit and rather than write "1000 grams," it should be written as *one kilogram* (1 kg).

The following prefixes are used in the Metric System:

atto(a)	= 0.000000000000000001	= 10^{-18}
femto(f)	= 0.000000000000001	= 10^{-15}
pico(p)	= 0.000000000001	= 10^{-12}
nano(n)	= 0.000000001	= 10^{-9}
micro(μ)	= 0.000001	= 10^{-6}
milli(m)	= 0.001	= 10^{-3}
centi(c)	= 0.01	= 10^{-2}
deci(d)	= 0.1	= 10^{-1}
deca(dk)	= 10	= 10^1
hecto(h)	= 100	= 10^2
kilo(k)	= 1,000	= 10^3
mega(M)	= 1,000,000	= 10^6
giga(G)	= 1,000,000,000	= 10^9
tera(T)	= 1,000,000,000,000	= 10^{12}

Metric Weights and Measures

Linear Measure

10 millimeters(mm) = 1 centimeter(cm)
10 centimeters = 1 decimeter(dm) = 100 millimeters
10 decimeters = 1 meter(m) = 1,000 millimeters
10 meters = 1 decameter(dkm)
10 decameters = 1 hectometer(hm) = 100 meters
10 hectometers = 1 kilometer(km) = 1,000 meters

Area Measure

100 square millimeters(mm²) = 1 square centimeter(cm²)
10,000 square centimeters = 1 square meter(m²) = 1,000,000 square millimeters
100 square meters = 1 are(a)
100 ares = 1 hectare(ha) = 10,000 square meters
100 hectares = 1 square kilometer(km²) = 1,000,000 square meters

Volume Measure

10 milliliters(mℓ) = 1 centiliter(cℓ)
10 centiliters = 1 deciliter(dℓ) = 100 milliliters
10 deciliters = 1 liter(ℓ) = 1,000 milliliters
10 liters = 1 decaliter(dkℓ)
10 decaliter³ = 1 hectoliter(hℓ) = 100 liters
10 hectoliters = 1 kiloliter(kℓ) = 1,000 liters

Cubic Measure

1,000 cubic millimeters(mm³) = 1 cubic centimeter(cm³)
1,000 cubic centimeters = 1 cubic decimeter(dm³) = 1,000 cubic millimeters
1,000 cubic decimeters = 1 cubic meter(m³) = 1 stere =
1,000,000 cubic centimeters =
1,000,000,000 cubic millimeters

Weight

10 milligrams(mg) = 1 centigram(cg)
10 centigrams = 1 decigram(dg) = 100 milligrams
10 decigrams = 1 gram(g) = 1,000 milligrams
10 grams = 1 decagram(dkg)
10 decagrams = 1 hectogram(hg) = 100 grams
10 hectograms = 1 kilogram(kg) = 1,000 grams
1,000 kilograms = 1 metric ton(t)

MATHEMATICAL EXPRESSIONS

TYPING AND EDITING

In typing and editing equations, the following practices are observed:

1. If the equation is too long for one line, break it after a plus or a minus sign.
2. Align a series of equations on their equal signs.
3. Check that parentheses, brackets, and braces occur in pairs.
4. When an equation is derived from preceding ones, check for symbols that did not occur in them or were not introduced in text, including changes in subscripts.

Equations are labeled by a reference number so that the writer does not have to repeat the entire equation every time he discusses it. The reference number should be placed in parentheses on the right margin. The numbers should be typed on the same line as the equation. If the equation is broken, the reference number should be in line with the end of the equation.

MISCELLANEOUS TYPING STANDARDS

1. A page should not end or begin with less than two lines of text, nor should a paragraph heading appear near the end of a page unless it is followed by at least two lines of text.
2. Hyphenation of words should be kept to a practical minimum with no more than five per page. As a general rule, hyphenations should not occur more than two or three per paragraph and seldom on two consecutive lines or on the last line of a page. A word should be broken at a syllable or at the hyphen in a compound word. Also, a word should be divided so that at least three letters precede and follow the hyphen.
3. Unless instructions note otherwise, figures and tables should follow their initial reference. When space for figures is indicated to be left in text, the space should fall where noted or at the top of the next page.
4. Numbered listings should be typed with the number at paragraph indent and with double spacing between entries. The text should be blocked on the left and brought to the right-hand margin.
5. Equations between paragraphs should be centered and the equation number typed at the right-hand margin. Two or more equations in a group should be aligned on their equal signs, the longest of the group centered.
6. Equation terms in text having superscripts and subscripts should be typed so that the space between lines does not have to be altered.

VI. ABBREVIATIONS

ABBREVIATIONS

Abbreviations should be used sparingly in text and must always be clear to the reader. If abbreviations are in common usage outside the technical fields, they may be used in text without definition; for example, F for Fahrenheit and K for Kelvin, DDT, IQ, rpm. Abbreviations widely employed in technical work also may be used without definition, such as ac, dc, rms, psi, db, cps, Btu. Most abbreviations, however, should be accompanied by their definitions the first time they appear in a publication. The usual method is to place the abbreviation in parentheses immediately following the word or phrase it represents, as "meta-bromoanisole (MBA)," "exploding bridgewire (EBW)," and "thin-layer chromatography (TLC)."

Occasionally the need for a large number of abbreviations makes it impractical to define or spell out each term. When this occurs, the abbreviations may be defined in a glossary rather than in text. In illustrations and tables, abbreviations may be used extensively to conserve space. The following rules apply to the use of abbreviations in technical reports:

1. Omit periods in an abbreviation unless the abbreviated form spells a common word, as "in." for "inch," or unless the abbreviation is normally punctuated in non-technical English, such as "Q.E.D.," "etc.," "Co.," and "vs."
2. Retain the singular form for all abbreviations: "sec" represents both second and seconds.
3. Select only one form of an abbreviation that has two or more forms, and use the selected form consistently throughout a report.
4. Use the symbols for "per" and "by" only with abbreviated units of measurement, as in 10 ft/sec and 8 x 10 ft.
5. Omit the degree sign in numerical expressions of temperature. In mathematical expressions involving temperature variation, however, the degree sign is normally used:

32 C 300 K 270 F

but,

inch/°F

CHEMICAL ELEMENTS AND THEIR ABBREVIATIONS

actinium	Ac	mendelevium	Md
aluminum	Al	mercury	Hg
americium	Am	molybdenum	Mo
antimony	Sb	neodymium	Nd
argon	A	neon	Ne
arsenic	As	neptunium	Np
astatine	At	nickel	Ni
barium	Ba	niobium*	Nb
berkelium	Bk	nitrogen	N
beryllium	Be	nobelium	No
bismuth	Bi	osmium	Os
boron	B	oxygen	O
bromine	Br	palladium	Pd
cadmium	Cd	phosphorus	P
calcium	Ca	platinum	Pt
californium	Cf	plutonium	Pu
carbon	C	polonium	Po
cerium	Ce	potassium	K
cesium	Cs	praseodymium	Pr
chlorine	Cl	promethium	Pm
chromium	Cr	protactinium	Pa
cobalt	Co	radium	Ra
columbium*	Cb	radon	Rn
copper	Cu	rhodium	Re
curium	Cm	rubidium	Rh
dysprosium	Dy	ruthenium	Rb
einsteinium	Es	samarium	Ru
erbium	Er	scandium	Sm
europium	Eu	selenium	Sc
fermium	Fm	silicon	Se
fluorine	F	silver	Si
francium	Fr	sodium	Ag
gadolinium	Gd	strontium	Na
gallium	Ga	sulfur	Sr
germanium	Ge	tantalum	S
gold	Au	technetium	Ta
hafnium	Hf	tellurium	Tc
helium	He	terbium	Te
holmium	Ho	thallium	Tb
hydrogen	H	thorium	Tl
indium	In	thulium	Th
iodine	I	tin	Tm
iridium	Ir	titanium	Sn
iron	Fe	tungsten*	Ti
krypton	Kr	uranium	W
lanthanum	La	vanadium	U
lawrencium	Lw	wolfram*	V
lead	Pb	xenon	W
lithium	Li	ytterbium	Xe
lutetium	Lu	yttrium	Yb
magnesium	Mg	zinc	Y
manganese	Mn	zirconium	Zn
			Zr

*Columbium is another name for niobium; wolfram is another name for tungsten.

TWO-LETTER STATE ABBREVIATIONS*

Approved for Use with ZIP Code Only

Alaska.....	AK	Montana.....	MT
Alabama.....	AL	Nebraska.....	NB
Arizona.....	AZ	Nevada.....	NV
Arkansas.....	AR	New Hampshire.....	NH
California.....	CA	New Jersey.....	NJ
Canal Zone.....	CZ	New Mexico.....	NM
Colorado.....	CO	New York.....	NY
Connecticut.....	CT	North Carolina.....	NC
Delaware.....	DE	North Dakota.....	ND
District of Columbia.....	DC	Ohio.....	OH
Florida.....	FL	Oklahoma.....	OK
Georgia.....	GA	Oregon.....	OR
Hawaii.....	HI	Pennsylvania.....	PA
Idaho.....	ID	Puerto Rico.....	PR
Illinois.....	IL	Rhode Island.....	RI
Indiana.....	IN	South Carolina.....	SC
Iowa.....	IA	South Dakota.....	SD
Kansas.....	KS	Tennessee.....	TN
Kentucky.....	KY	Texas.....	TX
Louisiana.....	LA	Utah.....	UT
Maine.....	ME	Vermont.....	VT
Maryland.....	MD	Virginia.....	VA
Massachusetts.....	MA	Virgin Islands.....	VI
Michigan.....	MI	Washington.....	WA
Minnesota.....	MN	West Virginia.....	WV
Mississippi.....	MS	Wisconsin.....	WI
Missouri.....	MO	Wyoming.....	WY

*Canal Zone, District of Columbia, Puerto Rico, and Virgin Islands also included.

ABBREVIATIONS FOR SURFACE AREA MEASUREMENTS

S	Surface area (cm^2)
So	General term for specific surface area (cm^2/g)
So(P)	Air permeability specific surface area (cm^2/g) (FSSS)
So(A)	Gas adsorption specific surface area (cm^2/g)
So(B)	Blaine permeameter specific surface area (cm^2/g)
So(K)	Knudsen flow specific surface area (cm^2/g)
So(Z)	Zeiss specific surface area (cm^2/g)

SYMBOLS

MATHEMATICAL

$\pm$	: plus or minus
$\times$	: multiplied by; times; into
$\cdot$	: multiplied by; times; into
δ	: partial differential
$\equiv$	: identical with
$>$	: is greater than
$<$	: is less than
$\propto$	: varies directly as; is directly proportional to
$\div$	: divided by
∞	: infinity
Δ	: delta, finite difference
∇	: del—(used in vector analysis)
$\sqrt{}$	: radical
$\int$	: integral
π	: Pi - (3.1416)
$\approx$	: nearly equals
ℓ	: liter
$\sim$	: approximate(ly)

CHEMICAL

$\rightarrow$	: give, pass over to, or lead to
$\leftarrow$	: forms and is formed
$\downarrow$	: indicates precipitation of the substance
$\uparrow$	: indicates that the substance passes off as a gas

GREEK ALPHABET

<u>Upper Case</u>	<u>Lower Case</u>
	α : Alpha
	β : Beta
Γ	γ : Gamma
Δ	δ : Delta
	ϵ : Epsilon
	ζ : Zeta
	η : Eta
Θ	θ : Theta
	ι : Iota
	κ : Kappa
Λ	λ : Lambda
	μ : Mu
	ν : Nu
Ξ	ξ : Xi
	$\omicron$: Omicron
Π	π : Pi
	ρ : Rho
Σ	σ : Sigma
	τ : Tau
Υ	υ : Upsilon
Φ	ϕ : Phi
	χ : Chi
Ψ	ψ : Psi
Ω	ω : Omega

LANGUAGE ACCENTS

' : acute
 ` : grave
 " : dieresis
 ~ : tilde
 ^ : circumflex

PHYSICS

α : alpha particle
 β : beta ray
 λ : wave length
 μ : micron, permeability,
 coefficient of viscosity,
 index of refraction
 μμ : micromicron
 ρ : density

MISCELLANEOUS

¶ : paragraph
 § : section
 † : dagger; died
 = : double underscore

SUPER SCRIPT AND SUB SCRIPT NUMBERS

1 2 3 4 5 6 7 8 9 0

SYMBOL - IBM SELECTRIC

✓		{	}	±	∇	ℓ	ℓ	ℓ	ℓ	—	ℓ
1	2	3	4	5	6	7	8	9	0	=	ℓ
Γ	Δ	←	Θ	→	T	E	↑	↓	ℓ	Π	
γ	δ	ε	θ	τ	υ	ξ	ι	ο	ρ	π	
∇	Σ	Φ	<	Λ	Π	>	§	Ω	^	•	
α	σ	φ	ι	λ	η	ι	κ	ω	..	÷	
≈	≡	Ψ	α	∞	~	∂	~	†	∫		
ζ	χ	ψ	×	β	ν	μ	~	~	ℓ		

TECHNICAL AND SCIENTIFIC ABBREVIATIONS

abscissa	absc	backward wave oscillator.....	BWO
absolute.....	abs	barometer.....	bar.
acre.....	spell out	barrel.....	bbl
acre-foot.....	acre-ft	Baumé.....	Bé
air horsepower.....	air hp	board feet (feet board measure)...	fbm
alternating-current (as adjective).....	a-c	boiler pressure.....	spell out
altitude.....	alt	boiling point.....	bp
ambient.....	amb	brake horsepower.....	bhp
ampere.....	amp	brake horsepower-hour.....	bhp-hr
ampere-hour.....	amp-hr	Brinell hardness number.....	Bhn
amplitude, an elliptic function.....	am.	British thermal unit.....	Btu
Angstrom unit.....	Å	bushel.....	bu
anode.....	an		
antenna.....	ant	calculated.....	calc
antilogarithm.....	antilog	calorie.....	cal
approximate.....	approx	candle.....	c
atmosphere.....	atm	candle-hour.....	c-hr
assembly.....	assby	candlepower.....	cp
atomic number.....	at. no.	capacitance.....	c
atomic weight.....	at. wt	capacity.....	cap
audio frequency.....	af	carat.....	Kt
average.....	avg	cathode.....	cath
avoirdupois.....	avdp	cathode-ray tube.....	CRT
azimuth.....	az or α	cent.....	c or ¢

center of gravity.....c.g.	cord.....cd
center to center.....c to c	cosecant.....csc
centigram.....cg	cosine.....cos
centiliter.....cl	cosine of the amplitude, an elliptic function.....cn
centimeter.....cm	cost, insurance, and freight.....cif
centimeter-gram-second (system).....cgs	cotangent.....cot.
centimeters per second.....cm/sec	coulomb.....spell out
centimeters per second per second.cm/sec ²	counterclockwise.....ccw
chemical.....chem	counter electromotive force.....cemf
chemically pure.....cp	cubic.....cu
circuit.....cct	cubic centimeter.....cu cm, cm ³
circular.....cir	
circular mil foot.....circ mil ft	cubic foot.....cu ft
circular mils.....cir mils	cubic feet per minute.....cfm
clockwise.....cw	cubic feet per second.....cfs
coefficient.....coef	cubic inch.....cu in.
colinear.....colin	cubic meter.....cu m or m ³
cologarithm.....colog	cubic micron.....cu μ or cu μ u or μ^3
concentrate.....conc	cubic millimeter.....cu mm or mm ³
concentration of hydrogen.....pH	cubic yard.....cu yd
conductivity.....cond	current density.....spell out
congruent.....congr	cycles per second.....cps
constant.....const	cylinder.....cyl
continental horsepower.....cont hp	
continuous wave.....cw	day.....spell out

deceleration.....	decel	electromagnetic unit.....	emu
decibel.....	db	electromotive force.....	emf
definition.....	def	electron volt.....	ev
degree.....	deg or °	electrostatic unit.....	esu
degree centigrade.....	C	elevation.....	el
degree Fahrenheit.....	F	equation.....	eq
degree Kelvin.....	K	equivalent.....	equiv
degree Réaumur.....	R	exponent.....	exp
delta amplitude an elliptic function...	dn	external.....	ext
diagonal.....	diag	extrapolate.....	extrap
diameter.....	diam		
differential.....	diff	farad.....	spell out or f
dimension.....	dim	feet board measure (board feet)...	fbm
diopter.....	spell out	feet per minute.....	fpm
direct current.....	dc	feet per second.....	fps
direct current (as adjective).....	d-c	fluid.....	fl
divergence.....	div	foot.....	ft
dollar.....	\$	foot-candle.....	ft-c
dozen.....	doz	foot-lambert.....	ft-L
dram.....	dr	foot-pound.....	ft-lb
		foot-pound-second (system).....	fps
efficiency.....	eff	foot-second(see cubic feet per second)	
electric.....	elec	franc.....	fr
electromagnetic.....	e-m	free aboard ship.....	spell out
electromagnetic force.....	emf	free alongside ship.....	spell out

free on board.....fob	hour.....hr
freezing point.....fp	hour (in astronomical tables)....h
frequency.....spell out	hundred.....C
frequency modulation.....f-m	hundredweight (112 lb).....cwt
fusion point.....fnp	hyperbolic cosine.....cosh
	hyperbolic cosecant.....csch
gallon.....gal	hyperbolic sine.....sinh
gallons per minute.....gpm	hyperbolic tangent.....tanh
gallons per second.....gps	
grain.....gr	inch.....in.
gram.....g	inch-pound.....in.-lb
gram-calorie.....g-cal	inches per second.....ips
greatest common divisor.....gcd	indicated horsepower.....ihp
	indicated horsepower-hour....ihp-hr
harmonic.....harm	infrared.....IR
haversine.....hav	inside diameter.....ID
hectare.....ha	instrument.....inst
henry.....h	integral.-.....int, integ
high frequency.....h-f	intermediate-frequency.....i-f
high-pressure (adjective).....h-p	intermediate-pressure (adjective)..i-p
high voltage.....h-v	internal.....int
hogshead.....hhd	
horizontal.....horiz	joule.....j
horsepower.....hp	
horsepower-hour.....hp-hr	kilo-.....k

kilocalorie.....	kcal	logarithm (natural).....	log. or ln
kilocycles per second.....	kc	longitude.....	long. or λ
kilogram.....	kg	low-pressure (as adjective).....	l-p
kilogram-calorie.....	kg-cal	lumen.....	l or lm
kilogram-meter.....	kg-m	lumen-hour.....	l-hr or lm-hr
kilograms per cubic meter....	kg per cu m or kg/m^3	lumens per watt.....	lpw
kilograms per second.....	kgps	magnetic.....	mag
kiloliter.....	kl	magnetomotive force.....	mmf
kilometer.....	km	mass.....	spell out
kilometers per second.....	kmps	mathematics (ical).....	math
kilovolt.....	kv	maximum.....	max
kilovolt-ampere.....	kva	mean effective pressure.....	mep
kilowatt.....	kw	mean horizontal candlepower....	mhcp
kilowatthour.....	kwhr	megacycle.....	spell out
kinetic energy.....	KE	megohm.....	spell out
lambert.....	L	melting point.....	mp
latitude.....	lat or ϕ	meter.....	m
least common multiple.....	lcm	meter-kilogram.....	m-kg
linear foot.....	lin ft	micro.....	μ
liquid.....	liq	microampere.....	μa or μa
lira.....	spell out	microfarad.....	μf
liter.....	l	microgram.....	μg
logarithm (common).....	log	microhenry.....	μh
		microinch.....	$\mu\text{in.}$

micromho..... μ mho
 micromicrofarad..... $\mu\mu$ f
 micromicrohenry..... $\mu\mu$ h
 micromicron..... $\mu\mu$ or μ μ
 micron..... μ or μ
 microsecond..... μ sec
 microvolt..... μ v
 microwatt..... μ w or μ w
 mile.....spell out
 miles per hour.....mph
 miles per hour per second.....mphps
 milli-.....m
 milliampere.....ma
 milligram.....mg
 millihenry.....mh
 millilambert.....mL
 milliliter.....mℓ
 millimeter.....mm
 millimicron..... μ m or m μ
 million.....spell out
 million gallons per day.....mgd
 millisecond.....msec
 millivolt.....mv
 milliwatt.....mw
 minimum.....min

minute.....min
 minute (angular measure)..... $'$
 minute (time)(in astronomical tables)
m
 modulation.....mod
 modulus.....mod
 mole.....spell out
 molecular weight.....mol wt
 month.....spell out

 nano-.....n
 nanosecond.....nsec
 National Electrical Code.....NEC
 natural logarithm.....nl
 negative-positive-negative.....NPN

 ohm.....spell out or Ω
 ohm-centimeter.....ohm-cm
 optimum.....opt
 ordinate.....ord
 oscillate.....osc
 ounce.....oz
 ounce-foot.....oz-ft
 ounce-inch.....oz-in.
 outside diameter.....OD

parts per billion.....ppb	quadrant.....quad
parts per million.....ppm	quantity, quantitative.....quant
peck.....pk	quart.....qt
penny (pence).....d	quotient.....quot
pennyweight.....dwt	
peso.....spell out	radian.....spell out
pico-.....p	radio frequency.....r-f
picofarad.....pf	reactive kilovolt-ampere.....kvar
pint.....pt	reactive volt-ampere.....var
positive-negative-positive.....PNP	reciprocal.....recip
potential.....spell out	revolutions per minute.....rpm
potential difference.....spell out	revolutions per second.....rps
pound.....lb	rod.....spell out
pound-foot.....lb-ft	root mean square.....rms
pound-inch.....lb-in.	
pound sterling.....£	secant.....sec
pounds per brake horse-power-hour..lb per bhp-hr	second.....sec
pounds per cubic foot.....lb per cu ft	second (angular measure)....."
pounds per square foot.....psf	second-foot (see cubic feet per second)
pounds per square inch.....psi	second(time)(in astronomical tables)s
pounds per square inch absolute.....psia	shaft horsepower.....shp
pounds per square inch gage.....psig	shilling.....s
power factor.....spell out or pf	sine.....sin
precipitate.....ppt	

VII. WORD USAGE

COMMONLY CONFUSED WORDS

The following alphabetical list contains over 200 of the most frequently misused words and pairs of similar words, both technical and nontechnical, which are encountered in our work.

A, AN

It is *sound*, not spelling, that determines the correct usage of the indefinite article. Before all consonant sounds, use *a*; before all vowel sounds, use *an*. But note that some vowels are sounded as consonants, and vice versa.

a BLS report	an AEC report
a ZI base	an FAA ruling
a human being	an NSA proclamation
a 4-year old study	an 8-year old study
a historical review	an honor
a union ("y" sound)	an altimeter
a oneness ("w" sound)	an hour

ACCURACY

Refers to the discrepancy between the true value and the result obtained by measurement.

PRECISION

Refers to the agreement among repeated measurements of the same quantity.

ADJUST

Adjustments or changes—usually slight ones—may be made without even hinting at calibration. *Adjust* is now and then confused with *calibrate*.

CALIBRATE

Suggests the determination of exact gradations, as of a measuring device.

ADVISE

To counsel or warn; should not be used for *inform*.

INFORM

To communicate knowledge to, tell, or acquaint.

ABSORPTION

A taking up or drinking in; an engrossment.

ADSORPTION

The adhesion of gas or liquid to the surface of a solid.

ADAPT

To adjust.

ADEPT

Skilled.

ADOPT

To choose or take as one's own.

AFFECT	Verb meaning to act upon; to change.
EFFECT	Noun meaning a result; may also be used as a verb meaning <i>to cause</i> or <i>to bring about</i> . The change does not <i>affect</i> me. The change will have no <i>effect</i> on me. They will <i>effect</i> a change in procedure.
AFFLUENT	Abundant or copious.
EFFLUENT	Outflowing; that which outflows.
ELUENT	The solvent used in eluting (washing out).
ALTERNATE	Means reciprocal, occurring or succeeding by turns.
ALTERNATIVE	Offers two things, one of which must be chosen, as the alternative of using an aqueous or a nonaqueous solvent.
ALTITUDE	The height above sea level at which an aircraft is flying.
ATTITUDE	The position of something in relation to a frame of reference.
AMONG	Used with more than two things.
BETWEEN	Used with two things.
ANION	A negatively charged ion.
ONION	A familiar edible plant.
ANTE-	A prefix meaning <i>before</i> .
ANTI-	A prefix meaning <i>against</i> .
ANTENNAS	The plural of a radio or radar antenna is <i>antennas</i> , not <i>antennae</i> , which is a zoological term meaning an insect's "feelers."
APOGEE	The point <i>farthest</i> from earth in the orbit of a satellite.
PERIGEE	The point <i>nearest</i> the earth.

APPARENT Open to view. Appearing as actual to the eye or mind.
OBVIOUS Unavoidably clear, so clear as to need no explaining.
EVIDENT Demonstrable by facts or evidence.

APT Suggests habitual tendency.
LIABLE Exposed to risk; limited to expressions of something unpleasant.
LIKELY Merely probable.

A project director is *apt* to have many responsibilities.
This broken filter is *liable* to cause trouble.
It is *likely* that our project will succeed.

ARGON An element - not capitalized.

AS Do not use as a substitute for *since* or *because*. The word *as* is a very busy word; it is used in so many different ways that to burden it with another responsibility is liable to confuse the reader. To illustrate, here are some of the uses of *as*:

My instructions are the same *as* yours.
As a result of his trip, he was tired.
This coupler is not *as* good *as* that one.
As time goes on, the radioactivity decays.
It looks *as* though it might rain.
Do *as* I do.

Therefore, do NOT say:

As the hatch is defective, we shall have to hold the countdown. (Use *since*.)

The alpha particle emitters represent little hazard externally, *as* these emissions are stopped by the outer layer of skin. (Use *since* or *because*.)

AS, LIKE (See LIKE.)

ASSIMILATE To absorb or appropriate.

SIMULATE To assume the appearance of, to feign.

ASSURE	To confirm or to make (one) certain.
INSURE	To assure against a loss by a contingent event, on certain stipulated conditions or at a given rate, <i>i.e.</i> , to underwrite.
ENSURE	To make sure, certain, safe, to guarantee.
ASYMMETRY	The opposite of symmetry (note one <i>s</i> and two <i>m</i> 's).
SYMMETRY	Balance, or correspondence in size or shape.
AT	Used for a thing.
WITH	Used for a person. ...angry <i>at</i> the decision. ...angry <i>with</i> her.
BESIDE	At the side of.
BESIDES	In addition to. They stood <i>beside</i> the tower. <i>Besides</i> the amplifier, there is also the receiver to consider.
BETWEEN	(See AMONG.)
BI-	A prefix meaning TWO (<i>bifocals, bilateral</i>); also, it means OCCURRING EVERY TWO, as in <i>biweekly</i> (every two weeks), <i>bimonthly</i> (every two months), <i>biennial</i> (every two years).
SEMI-	A prefix meaning half (<i>semicircle, semisolid</i>); also, it means OCCURRING TWICE, as in <i>semiweekly</i> (twice a week), <i>semimonthly</i> (twice a month), <i>semiannual</i> (twice a year).
BRIDGEWIRE	Written as one word - not capitalized.
BRING	To convey toward. (<i>bring</i> : come)
TAKE	To convey away from. (<i>take</i> : go)

CANNOT	Written as one word unless very great emphasis is desired on the <i>not</i> .
CANVAS	A tent cloth.
CANVASS	A survey; to make a survey or to solicit.
CAPITAL	First quality; upper case; punishable with death; of or relating to capital [adjective]; the capital city of a state or country; accumulated wealth [noun].
CAPITOL	Noun only. When capitalized, it means the official building of Congress in Washington, D.C.; when uncapitalized, it means the capitol building where a state legislature meets.
CEDE	To give up or grant.
SEED	Part of a plant.
CLIMACTERIC	A critical or decisive period; pertaining to it.
CLIMACTIC	Relating to a climax.
CLIMATIC	Pertaining to climate.
COARSE	Not precise; rough or loose in texture.
COURSE	A path or progression. A <i>coarse</i> versus a fine grid. The missile went off <i>course</i> .
COMPARE TO	Used for broad, general comparisons.
COMPARE WITH	Used for specific, detailed comparisons. Compared <i>to</i> a hurricane, this wind is mild. Compare our proposal <i>with</i> theirs.
COMPLEMENT	To complete; that which completes.
COMPLIMENT	To praise; praise given.
COMPREHENSIBLE	Understandable.
COMPREHENSIVE	Extensive, of wide range.

CONTINUAL	Occurring in steady and rapid succession; constant.
CONTINUOUS	Without interruption or break; unlike <i>continual</i> , it may apply to space as well as time. They were <i>continually</i> being interrupted. The rain was <i>continuous</i> for three hours.
CONTRAST	(TO) (WITH) (BETWEEN) When <i>contrast</i> is a noun, <i>to</i> and <i>with</i> are interchangeable; when <i>contrast</i> is a verb, <i>with</i> is used. This new theory is in contrast <i>to</i> (<i>with</i>) the old one [noun]. Let us contrast this new theory <i>with</i> the old one [verb]. In the following type of construction, <i>between</i> should be used. Observe the contrast <i>between</i> these two theories.
CORE	The central part.
CORPS	An organized body of persons, usually consisting of two or more military divisions. Singular and plural are spelled the same, but the <i>s</i> is pronounced only in the plural. The <i>p</i> is never pronounced.
DATA	Originally the plural of <i>datum</i> and always used with a plural verb.
DEFINITE	Clear, unmistakable.
DEFINITIVE	Fixed, unalterable, not subject to revision.
DETTASHEET	Capitalized (trademark) (<i>pronounced Dettasheet</i>).
DIALECTICS	A branch of logic teaching the art of debate.
DIELECTRIC	A nonconducting material.
DIFFERENT	(FROM) (THAN) <i>Different from</i> is the preferred form. Your job is <i>different from</i> mine.

Sometimes, however, the word *from* may necessitate an awkward, roundabout construction; so for the sake of smoothness, *than* may be used.

We are studying this project from a different point of view *than* they are.

DISCREET Prudent, circumspect, possessed of good judgment.
DISCRETE Separate, composed of discontinuous elements.

DISINTERESTED Impartial, not prejudiced.
UNINTERESTED Indifferent, having no interest.

A *disinterested* person should evaluate this paper.
He is *uninterested* in art.

DISTINGUISH Means to recognize (and point out) those aspects
 of something that mark its separate identity.
DIFFERENTIATE Means to point out the difference between two things.
 Also to take the derivative of a function.

DUE TO (BECAUSE OF) There is disagreement among writers
 about this usage, but the most careful writers avoid
 using *due to* as a substitute for *because of* or *owing*
 to. Strictly speaking, *due to* should be used only
 after some form of the verb *to be*.

NOT: *Due to* the narrow field of view of the
 camera, it was difficult to collimate
 the antenna with the biasing network.

BUT: *Because of* the narrow field of view...

OR: The difficulty with the antenna *was due to*
 the narrow field of view of the camera.

DU PONT Capitalized when *Du Pont* only is used, but see example
 below when using the full name:

E. I. du Pont de Nemours & Co.

EFFLUENT (See AFFLUENT, ELUENT.)

EFFECT (See AFFECT.)

ELECTRIC	(ELECTRICAL) The preferred adjective to <i>electrical</i> (electric motor, electric lights, electric wiring), except in special phrases like <i>electrical engineer</i> .
ELECTRONIC	Refers to the use of electron tubes, transistors, etc., in the fields of radio, TV, computers, and related fields. Usually written in plural form when referring to the <i>electronics</i> industry.
ELUENT	(See AFFLUENT, EFFLUENT.)
EMINENT	Distinguished, notable.
EMANATE	To emit or issue forth.
IMMANENT	Inherent, indwelling, subjective.
IMMINENT	Impending or threatening to occur immediately.
ENABLE	To provide power or competency to be or do something.
PERMIT	To allow or authorize.
EVOLVE	To work out or derive; to give off or emit.
INVOLVE	To implicate; to complicate; to contain.
EXTRUDABILITY	Spelled with <u>ability</u> .
FARTHER	Should be restricted to expressions of physical distance.
FURTHER	Is used for all other concepts. He traveled <i>farther</i> than he realized. <i>Further</i> research is necessary.
FEWER	(See LESS.)
FIBERGLAS	Capitalized (trademark).
FIBERGLASS	This word is spelled with double "s" and not capitalized when used other than trademark.
FIGURATIVELY	(See LITERALLY.)

FISSION	The splitting of a heavy atomic nucleus, resulting in the release of energy (e.g., the atom bomb).
FUSION	The union of light-weight atomic nuclei, also resulting in the release of energy (e.g., the hydrogen bomb).
FLAMMABLE	Both words have the same meaning. However, <i>flammable</i> is preferred. (Same as above.)
INFLAMMABLE	
FLORESCENT	Flourishing; about to bloom or unfold.
FLUORESCENT	Emitting electromagnetic radiation in the form of usable light.
FOREWORD	A preface; literally, <i>a word before</i> .
FORWARD	Near the front; advanced.
FORMULAS	The plural of <i>formula</i> should be written <i>formulas</i> , not <i>formulae</i> .
FUSE	A metallic device for breaking an overloaded circuit; also, a continuous train of explosive for setting off a dynamite charge.
FUZE	A detonating device for setting off a bomb or the war-head of a missile or rocket.
GERANIUM	A flowering plant.
GERMANIUM	A hard, brittle, nonmetallic element resembling silicon, used as a semiconductor.
GUARANTEE	To warrant the reliability of something [verb]; a warranty [noun].
GUARANTY	A financial security [noun only]. This word is never used as a verb.

HE (*high explosive*) Written without periods.

INSURE	Use <i>insure</i> , not <i>ensure</i> or <i>assure</i> , in the sense of to make certain or to enter into an insurance contract.
INTERPOLATE	To insert new material into a text.
INTERPELLATE	To question formally about a governmental policy.
EXTRAPOLATE	Opposite of <i>interpolate</i> ; to draw out.
INTO	Written as one word. Do not confuse with expressions like "He went in to see where they were."
IRRADIATE	To affect or treat by exposure to radiation; <i>irradiation</i> : the exposure to rays or the application of rays for therapeutic purposes.
RADIATE	To emit rays, to be radiant; <i>radiation</i> : the process of emitting radiant energy or the actual energy radiated. He was <i>irradiated</i> by radiation.
ITS IT'S	Possessive adjective made from the pronoun <i>it</i> . Contraction of <i>it is</i> .
LESS	Used to indicate amount in bulk or mass; never used with plurals.
FEWER	Used to indicate numbers of units; used with plurals. <i>Fewer</i> dollars... <i>less</i> money <i>Fewer</i> missiles... <i>less</i> production <i>Fewer</i> calories... <i>less</i> food <i>Fewer</i> pounds... <i>less</i> weight
LIABLE, LIKELY	(See APT.)
LIKE, AS	<i>Like</i> is a preposition requiring an object and should never be used as a conjunction to introduce clauses. <i>As</i> , <i>as if</i> , or <i>as though</i> should be used, depending upon the construction. WRONG: Do it <i>like</i> I showed you. RIGHT: Do it <i>as</i> I showed you. WRONG: This looks <i>like</i> it might be a successful test. RIGHT: This looks <i>like</i> a successful test. OR: This looks <i>as if</i> it might be a successful test.

HYPER-	A prefix meaning <i>over, above, beyond</i> .
HYPO-	A prefix meaning <i>under, less than, beneath</i> .
HYSTERESIS	A retardation of effect, or a lagging in values.
HYSTERIA	An emotional outburst.
IDENTICAL WITH	<i>Identical with</i> is the correct form, not <i>identical to</i> . The emission capability of this unit is <i>identical with</i> that of the other.
IF, WHETHER	The best modern authorities list these words as interchangeable when introducing noun clauses; however, when the phrase <i>or not</i> is included, <i>whether</i> must be used. He did not know <i>if (whether)</i> the ground equipment would check out all right. He did not know <i>whether or not</i> the ground equipment would check out all right.
IMPLY	To express indirectly, to hint.
INFER	To surmise, guess, or assume. A reader (or listener) <i>infers</i> something the writer (or speaker) <i>implies</i> . He <i>implied</i> by his remark that something had gone wrong in the lab. I <i>inferred</i> from his remark that something had gone wrong in the lab.
INCREDIBLE	Extraordinary, unbelievable.
INCREDULOUS	Skeptical; indicating disbelief.
INFORM, ADVISE	(See ADVISE.)
INGENIOUS	Clever, inventive, shrewd.
INGENUOUS	Free from guile, candid, honorable, naive.
INSIDE	Not <i>inside of</i> ; the <i>of</i> is superfluous.

LINEAL	Referring to ancestral family lines.
LINEAR	Referring to measurement, as <i>linear feet</i> .
LITERALLY	According to the "letter," or true to the fact.
FIGURATIVELY	By resemblance; by analogy; hypothetically.
LOOSE	Not fastened [adjective]; to make loose [verb].
LOSE	To miss, fail, or be deprived of [verb].
MACRO-	A prefix meaning <i>large</i> or <i>long</i> .
MICRO-	A prefix meaning <i>small</i> or <i>minute</i> .
MATERIAL	Substance, or parts, of which anything is made.
MATERIEL	Equipment and supplies of an organization.
MAY	To have permission to; to be possible.
CAN	To be able to.
MEMENTO	A remembrance, souvenir. This word is not spelled "momento," which is the Spanish word for "moment."
MOMENTUM	Quantity of motion; the property of a moving body which determines the length of time required to bring it to rest.
MISSILE	An unmanned aircraft; any thrown weapon or object.
MISSIVE	A letter.
MYLAR	Capitalized (trademark).
NAVAL	Pertaining to the Navy.
NAVEL	A part of the body; a "navel" orange.
NUMBER OF	"A" <i>number</i> is plural; "the" <i>number</i> is singular.
NYLON	Not capitalized - no longer a trademark.

ORDINANCE	A municipal law; a decree.
ORDNANCE	Military supplies of weapons and ammunition.
OUTSIDE	Never use <i>outside of</i> . <i>Outside</i> the building, the guards maintained a 24-hour watch. (NOT: <i>outside of</i> .) <i>Except for</i> a few minor adjustments, the prototype was ready for testing. (NOT: <i>outside of</i> .)
PARTIALLY	Completely.
PARTLY	Wholly. Although for many uses <i>partially</i> and <i>partly</i> may be synonymous, <i>partly</i> is preferred.
PASSED	Past tense of the verb <i>pass</i> .
PAST	Gone by or preceding [adjective]; beyond [preposition]; time gone by [noun]. The satellite <i>passed</i> its apogee at 6:30 pm [verb]. It went <i>past</i> its apogee [preposition]. <i>Past</i> progress has been good [adjective]. Progress in the <i>past</i> has been good [noun].
PER, AS PER	<i>Per</i> should be limited to expressions of measure: per diem, per annum, 5 bbl per day. Never use <i>per</i> as a substitute for <i>according to</i> , and never use <i>as per</i> for any reason! WRONG: <i>As per (per)</i> our contract, we must mail you the final report. RIGHT: <i>According to</i> our contract, we must mail you the final report.
PERIGEE	(See APOGEE.)
PHYSICAL	Pertaining to the body.
PSYCHICAL	Pertaining to the mind.

PORTION	A part of a whole.
PROPORTION	The relation of one portion to another, or to the whole, or of one thing to another, as respects magnitude, quantity, or degree.
PART	Should be reserved to express a comparative relation between things or magnitudes.
PLEXIGLAS	Capitalized (trademark).
PRACTICABLE	Capable of being worked out or developed.
PRACTICAL	Useful or serviceable—the opposite of theoretical or imaginative.
PRE-	A prefix meaning <i>before</i> .
POST-	A prefix meaning <i>after</i> .
PRECEDENCE	Priority in rank or time; note that the accent is on the second syllable, and the <i>e</i> is long.
PRECEDENTS	Plural of the noun <i>precedent</i> , meaning something which serves as an example or rule for future action. Accent on the first syllable.
PRECESSION	A turning, or moving off course.
PRECISION	State of being precise; accuracy.
PROCESSION	Continuous course; progression, moving onward.
PRESCRIBE	To issue a rule; to remedy; to ordain.
PROSCRIBE	To denounce or condemn.
PRESSABILITY	Spelled with <u>ability</u> .
PREVENTIVE	That which prevents; note that this word should not be written "preventative."
PRINCIPAL	Means (in technical usage) <i>main, chief, most important</i> ; <i>principal</i> is an adjective in technical writing.
PRINCIPLE	Means a physical truth or an accepted code of conduct. <i>principle</i> is always a noun.

QUALITATIVE	Relating to quality or kind; <i>qualitative analysis</i> : a branch of chemistry concerned with detecting and characterizing the elements in a pure substance or identifying the components of a mixture.
QUANTITATIVE	Relating to measurement of quantities; <i>quantitative analysis</i> : a branch of chemistry concerned with determining the amounts of elements in a pure substance or the percentages of components in a mixture.
RADIATE	(See Irradiate.)
REASON IS THAT	Do not say "the reason is because." "Because" is the answer to "why," and you would not ask "Why is the reason for..." WRONG: The reason we cannot test today is <i>because</i> we are having an electric storm. RIGHT: The reason we cannot test today is <i>that</i> we are having an electric storm. OR: We cannot test today <i>because</i> we are having an electric storm.
REGARDLESS	Do not use "irregardless" or "disregardless."
REMAINDER	Use <i>remainder</i> , not <i>balance</i> , when referring to the "rest" of something.
BALANCE	A financial balance. The <i>remainder</i> of the week was spent in proofreading. (NOT: <i>balance</i> .)
RESPECTFULLY	Full of respect.
RESPECTIVELY	Each in the order given.
SALINE	Consisting of salt.
SALIENT	Prominent; noticeable.
SEED	(See CEDE.)

SEMI-	(See BI-.)
SIGHT	Vision; to see.
SITE	The scene or position of something.
CITE	To call upon; to quote.
SILICON	Spelled without an <u>e</u> when used as an element.
SILICONE	Spelled with an <u>e</u> when used as molecular constituent.
SILASTIC	Capitalized (trademark).
SIMULATE	(See ASSIMILATE.)
SOLUTE	A dissolved substance.
SOLVENT	A substance capable of dissolving other substances.
SPECIMEN	Singular.
SPECIMENS	Plural.
STATIONARY	Fixed, stable.
STATIONERY	Articles sold by stationers—paper, notebooks.
SYLGARD	Capitalized (trademark).
THERE IS, THERE ARE	Avoid the use of these weak expressions when a more emphatic construction can easily be substituted.
THIS, THAT	Remember that <i>this</i> and <i>that</i> are singular; <i>these</i> and <i>those</i> are plural.
	WRONG: We cannot use <i>these</i> kind of filters.
	RIGHT: We cannot use <i>this</i> kind of filters.
	OR: If you would feel more comfortable, you may take the <u>s</u> off <i>filters</i> and say, "We cannot use this kind of filter."

TRANSMISSION	The transmitting of intangible things such as radio waves, heat, light, etc.; also, a gear mechanism or drive shaft.
TRANSMITTAL	The transmitting of tangible things such as mail, supplies, etc.; also, that which is transmitted.
TURBAN	A headdress.
TURBINE	A rotary engine actuated by steam, water, or air pressure.
UNDER WAY	Written as two words, means "moving" or "progressing," as "The project is <i>under way</i> ."
UNDERWAY	Written as one word, is always an adjective, meaning "while in a state of motion," as in " <i>underway</i> refueling."
UNINTERESTED	(See DISINTERESTED.)
UN-IONIZED	Not ionized.
UNIONIZED	Formed into a union.
UTILIZE, USE	As a verb, <i>use</i> has the same meaning as utilize, since nothing is gained in precision of meaning by using the longer word, the shorter words <i>use</i> , <i>used</i> , <i>using</i> should be used in place of <i>utilize</i> , <i>utilized</i> , <i>utilizing</i> .
VARIOUS	An adjective meaning different, changeable, inconstant.
VARYING	From the verb <i>to vary</i> , means modifying, altering in form, appearance, substance, position.
VICE	Corruption; a bad habit.
VISA	An endorsement made on a passport.
WISE	A mechanical device for holding work.
VISCOSE	A synthetic material made from cellulose; pertaining to or made from viscose.
VISCOSITY	Stickiness.
VISCOUS	Sticky.

WAVE To flutter; move to and fro.
WAIVE To relinquish something; to forego.

WHETHER, IF (See IF.)

WHILE *While* is used to introduce adverbial clauses of time.

While the report was being processed, the author
 took a vacation.

Never use *while* as a substitute for *although*, *whereas*,
or *but*.

WRONG: *While* the report is well written, it is
 inconclusive.

RIGHT: *Although* the report is well written, it
 is inconclusive.

WRONG: Your radio takes a-c current, *while* mine
 takes d-c.

RIGHT: Your radio takes a-c current, *but (whereas)*
 mine takes d-c.

FREQUENTLY ENCOUNTERED NAMES OF SCIENTISTS AND ENGINEERS

The names listed in this glossary are used so often that they have ceased to be just names and have become scientific words. Like other scientific words they are now fair game to be modified with prefixes and suffixes. In such cases they may even be written without capitalizing their first letters.

When a name is used as an adjective, to describe something, as for example,

Laplace transform	Poynting vector	Poisson ratio
Wheatstone bridge	Venturi nozzle	Taylor series
d'Arsonval galvanometer	Avogadro's number	Heaviside layer
van de Graaf generator	Young's modulus	Fermi level
Bunsen burner	Barkhausen effect	Dewar flask
Van Allen belt	Stokes' law	Planck's constant
	Bohr atom	

the capital remains at the front of the word as it would for any name. On the other hand, when a name has been made into a unit, the first letter is small, and the word is prey to the addition of prefixes and suffixes. For example,

watt, wattage, kilowatt
volt, voltage, microvolt
ohms, microhm
farad, micromicrofarad

An exception is the Ångstrom Unit, called the Ångstrom or Ångstrom Unit, with the little Scandinavian circle over the capital A.

There are also many cases where usage is not so standard where a name has prefixes and suffixes added to it but does not stand for a physical unit. So, sometimes, "Hamiltonian" is written with a capital, and sometimes it is written "hamiltonian." The same is true for "Lagrangian," "Laplacian," and many other words.

Ampere	Debye	Jacobi	Rabi
Angstrom	De Forest	Jeans	Rankine
Archimedes	Descartes	Joule	Raoult
Armstrong	Dewar	Kelvin	Réaumur
Avogadro	Dirac	Kepler	Reimann
Barkhausen	Doppler	Kirchhoff	Reynolds
Baumé	Edison	Lambert	Rumford
Bell	Einstein	Laplace	Russell
Bernoulli	Euclid	Laue	Rydberg
Berzelius	Euler	Lenz	Seebeck
Bessemer	Faraday	Leibniz	Shockley
Bohr	Fermat	Lissajous	Snell
Boltzmann	Fermi	Lorentz	Solvay
Boole	Fresnel	Maxwell	Sommerfeld
Bose	Fahrenheit	Mendeleev	Steinmetz
Boyle	Fourier	Michelson	Stokes
Bragg	Fraunhofer	Morley	Szilard
Brahe	Galileo	Morse	Taylor
Bridgman	Galvani	Nernst	Tesla
Bunsen	Gauss	Newton	Thomson
Cavendish	Gay-Lussac	Oersted	Torricelli
Cantor	Gibbs	Ohm	Urey
Compton	Gilbert	Pascal	Van Allen
Carnot	Haber	Pauli	van de Graaff
Celsius	Haldane	Pauling	van der Waals
Clausius	Hall	Peirce	van't Hoff
Clapeyron	Hamilton	Peltier	Venn
Clerk-Maxwell	Heaviside	Pitot	Venturi
Colpitts	Heisenberg	Planck	Volta
Coulomb	Helmholtz	Poisson	Von Braun
Curie	Henry	Poynting	Watt
Dalton	Hertz	Priestley	Wheatstone
d'Alembert	Hooke	Purcell	Wiener
d'Arsonval	Huygens	Pythagoras	Young
			Zeeman

SPECIAL INTERESTS

Chemistry-Spectroscopy

Henkin
Raman

High Explosives

Chapman-Jouquet
Hugoniot

VIII. PROOFREADER'S MARKS

PROOFREADER'S MARKS

INSERT MARKS FOR PUNCTUATION

✓	Apostrophe	└	Move down; lower
[/]	Brackets	┐	Move up; raise
: Ⓞ	Colon	└	Move to left
↗ /	Comma	┐	Move to right
xxx /	Ellipsis	¶	Paragraph
! /	Exclamation point	no ¶	No new paragraph
- /	Hyphen	out	Out; omit; see copy
↙ ↘	Inferior figure	s.c.	
..... /	Leaders	⊖	Reverse; upside down
(/)	Parentheses	rom	Roman, change to
⊙	Period	⤵	Run in material
? /	Question mark	run in	Run in material
↖ ↗	Quotation mark	on same line	
; Ⓞ	Semicolon	#	Space, add (horizontal)
✓ ✓	Superior figure	>	Space, add (vertical)
		○	Space, close up (horizontal)

OTHER MARKS

	Align type; set flush	<	Space, close up (vertical)
bf	Boldface type	Ⓢ	Spell out
x ⊗	Broken letter	tr	Transpose
≡ cap	Capitalize	(?) Ⓢ	Verify or supply information
C + m	Capitals and small capitals	wf	Wrong font

(Proofreader's Marks Cont'd)

ƒ Delete
ƒ Delete and close up
^ Insert (caret)
ital Italic, change to
bf ital Italic boldface
stet Let type stand
lc Lower case type

All marks should be
made in the margin on
same the line in which the
the error occurs; if more
than one correction
occurs in one line,
they should appear in
their order separated
by a slanting line.

Errors should not be
blotted out.

IX. BIBLIOGRAPHY

BIBLIOGRAPHY

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X. APPENDIX

Glossary of Scientific and Engineering Terms

GLOSSARY OF SCIENTIFIC AND ENGINEERING TERMS

A

- ab-er-ra-tion (n.), an imperfection in a lens
- ab-la-tion (n.), the removal of material by erosion, or melting and evaporation
- abort (v.), to end (an experiment) earlier than planned, usually because of failure
- abrade (v.), to wear away by rubbing (friction)
- ab-scis-sa (n.), the horizontal base line of a graph; also one of the coordinates of a point on a graph
- ab-so-lute (adj.), fundamental, basic, not relative to anything else, complete in itself
- ac-celer-ate (v.), to increase (or add to) speed
- ac-cel-er-omet-er (n.), a meter to measure acceleration
- ac-cep-tor (n.), one of a small group of atomic additives to semiconductors, the opposite of donor
- ac-cu-mu-la-tive (adj.), that which accumulates; added up
- ac-cu-mu-la-tor (n.), that which takes in; also a type of electronic circuit
- ace-tic acid (n.), an organic acid
- ace-to-(prefix), see acetic acid
- ac-e-tone (n.), an organic chemical compound, a solvent
- ace-tyl (n.), a radical of acetic acid
- a-cet-y-lene (n.), an organic chemical compound
- ach-ro-mat-ic (adj.), that light which, in passing through a compound lens, is not broken into its constituent colors
- acid (n.), from sour, a class of chemical compounds containing the hydrogen ion (H^+); can combine with a suitable base or alkali to form a salt
- acid-ic (adj.), that which is acid
- acid-i-fy (v.), to make acid; to turn into an acid
- acid-i-ty (n.), the degree to which something is acid
- acid-u-late (v.), to make slightly acid
- acous-tics (n.), the science of sound
- acryl-ic (n.), an organic chemical compound; also a synthetic plastic
- ac-tin-ic (adj.), pertaining to light rays that hit a surface and bring about a chemical change
- ac-tin-i-um (n.), a radioactive chemical element, Ac
- ac-tiv-i-ty (n.), a measure of the tendency of a chemical to react
- ac-tu-ate (v.), to set into action
- acute an-gle (n.), an angle smaller than 90°
- adapt-er (n.), a gadget or structure used to connect two parts or to change the possible uses of a piece of equipment
- ad-dend (n.), a number which is to be added to another number; see augend
- add-er (n.), an electrical circuit, usually in a computer
- add-ing (adj.), pertaining to a kind of electronic circuit
- ad-di-tive (adj.), able to be added, produced by addition; (n.), a substance added to another to effect some change
- ad hoc (adv.), for this particular situation only
- adi-a-batic (adj.), pertaining to an occurrence which proceeds without loss or gain of heat
- ad in-fi-ni-tum (adv.), without end or limit
- ad-mix (v.), to mix together
- aer-ate (v.), to cause air to flow through something

aer-o-dy-namics (n.), the science of movement through the air
aero-sol (n.), a cloud of fine particles floating in the air
af-fini-ty (n.), a measure of the tendency of two specified materials to react chemically
age (v.), a treatment involving exposure to some condition for a certain period of time
ag-glomer-ate (v.), to cluster together; (n.), a cluster
ag-gre-gate (v.), to cluster together loosely; (n.), a loose cluster; material used in mixing concrete, plaster, etc.
al-co-hol (n.), an organic chemical compound
al-de-hyde (n.), an organic chemical compound
al-ge-bra (n.), the branch of mathematics which treats numerical problems using a technique where items are represented by symbols (generally letters of the alphabet)
al-i-phat-ic (adj.), pertaining to a class of chemical compounds
al-ka-li (n., adj.), a class of chemical compounds containing the hydroxide radical (OH); also called a base
al-ka-line (adj.), see alkali
al-ka-lin-i-ty (n.), see alkali
al-ka-loid (adj.), see alkali
al-kyd (n.), a class of synthetic chemical compounds
al-kyl (n.), a class of organic chemical radicals
al-lo-trope (n.), a variation of structure for a given chemical or element, implying two or more forms; for example, two different crystal formations
al-lot-ro-py (n.), see allotrope
al-loy (n.), a mixture of metals; (v.), to melt metals together
al-lu-vi-al (adj.), silt deposited by running water
al-lu-vi-um (n.), see alluvial
al-lyl (n., adj.), a class of organic chemical radicals

Al-ni-co (n.), a magnetic alloy of iron, aluminum, nickel, and, in different combinations, cobalt, copper, or titanium
al-pha (n.), the first letter of the Greek alphabet α ; used as a symbol in many scientific terms, such as alpha metal, alpha ray, alpha particle
al-pha-nu-mer (-ic) (n., adj.), a code of characters made up of both letters and numbers
al-ter-nate (n.), every other one; (adj.), to occur in turns or succession
al-ter-nat-ing cur-rent (n.), an electric current which changes its direction (or polarity) in a regular manner; a-c
al-ter-na-tor (n.), an electric generator which produces alternating current
al-um (n.), a chemical compound; a salt
alu-mi-na (n.), the chemical compound aluminum oxide, Al_2O_3
alu-mi-nate (n.), a chemical radical of aluminum and oxygen
alu-mi-num (n.), a metallic chemical element, Al
al-u-nite (n.), a chemical compound; a mineral
amal-gam (n.), an alloy of mercury and another metal; a mixture of different metals
amal-ga-mate (n.), to mix to form a single compound
am-bi-ent (n., adj.), the surrounding environment; completely surrounding
am-big-u-ous (adj.), uncertain; having more than one meaning
am-er-i-ci-um (n.), a chemical element, Am
amine (n.), a class of chemical compounds derived from ammonia
ami-no (adj., prefix), a class of chemical compounds containing a particular radical (NH_2) or related radicals

am-me-ter (n.), a meter for measuring electrical current in amperes
 am-mo-nia (n.), the chemical compound NH_3
 am-mo-ni-a-cal (adj.), pertaining to the compound ammonia
 amor-phous (adj.), noncrystalline; having no definite shape
 am-per-age (n.), the unit of electric current flow, one coulomb per second; current strength
 am-pere (n.), the unit of electric current flow
 ampere-hour (n.), a unit describing the number of electrons that flow in an hour when there is a steady current of one ampere
 ampere-second (n.), the same as ampere-hour except the time interval is one second
 ampere-turn (n.), an electrical unit related to transformers
 am-pho-ter-ic (adj.), pertaining to a compound capable of reacting either as an acid or as an alkali
 am-pli-dyne (n.), a type of electrical-current generator
 am-pli-fi-ca-tion (n.), the act of making something bigger (usually an electrical quantity)
 am-pli-fi-er (n.), something which amplifies; a type of circuit
 am-pli-fy (v.), to make bigger
 am-pli-tron (n.), a class of high-power microwave tube
 am-pli-tude (n.), the size of a wave (height, loudness, or intensity)
 amplitude modulation (n.), regulation of wave size to achieve certain effects; abbreviated am
 am-pul or am-poule or am-pule (n.), a small vial or container
 amyl (n.), a class of chemical radicals
 an-a-log or an-a-logue (n.), similar to or like another
 anal-o-gous (adj.), resembling, corresponding, like

anal-o-gy (n.), resemblance, similarity; inference that if substances, things, or ideas are similar in some respects that they may be similar in other respects
 anal-y-sis (n.), intellectual investigation; the identification of components or constituents of a substance
 an-a-lyst (n.), one who analyzes
 an-a-lyt-ic (adj.), see analysis
 an-a-lyz-able (adj.), see analysis
 an-a-lyze (v.), see analysis
 an-as-tig-mat-ic (adj.), relating to a property of a lens
 an-echo-ic (adj.), without echoes; referring to a soundless room or chamber
 an-gle (n.), the geometric shape formed by two straight lines meeting at a point
 ang-strom unit (n.), one ten billionth of a meter; also Angstrom or Å
 an-gu-lar (adj.), having or forming an angle or angles
 an-hy-dride (n.), the compound that remains when water is removed from one that normally has water associated with it
 an-iso-trop-ic (adj.), having different properties or reactions in different directions or circumstances
 an-isot-ropy (n.), see anisotropic
 an-neal (v.), to heat a metal in order to soften it and make it less brittle
 an-nu-lar (adj.), having a ring or doughnut shape
 an-nu-lus (n.), a structure with a ring shape
 an-ode (n.), the positive terminal of a battery
 an-od-ize (v.), to subject a metal to electrolytic action (in an electrolytic cell)
 anom-a-lous (adj.), having no explanation, not conforming to the expected or to the rule

anom-a-ly (n.), that which does
 not conform to the general rule
 an-ten-na (n.), the wire or rod
 which receives electromagnetic
 (radio) waves and brings these
 signals into a radio or television
 set
 an-ti-log-a-rithm (n.), the number
 corresponding to a given logarithm;
 abbreviated anti log
 an-ti-mo-ny (n.), a chemical
 metallic element, Sb
 apex (n.), the topmost part
 ap-er-ture (n.), a small opening,
 usually in an optical system
 arc (n.), something arched or
 curved; a spark
 ar-ma-ture (n.), part of a motor
 or dynamo
 ar-senic (n.), a metallic chemical
 element, As
 aspher-i-cal (adj.), not quite
 spherical
 as-ta-tine (n.), a radioactive
 chemical element, At
 astig-ma-tism (n.), a lens defect
 asym-met-ric (adj.), not symmetric,
 askew, unbalanced
 asymp-tote (n.), a line on a graph
 that gets nearer and nearer to
 another line but never touches it
 at-mos-phere (n.), the layer of air
 around the earth; also any
 surrounding gaseous environment
 at-om (n.), the smallest particle
 of an element that can exist and
 still show all the properties
 of that element
 atom-ic (adj.), referring to atoms
 or atomic energy
 at-om-ize (v.), to break up into
 tiny particles
 at-ten-u-ate (v.), to reduce or make
 something less
 at-ten-u-a-tion (n.), see attenuate
 at-trac-tion (n.), a force pulling
 objects together
 at-tri-bute (n.), a basic quality or
 characteristic of something
 at-tri-tion (n.), wearing down by
 grinding or rubbing

atyp-i-cal (adj.), not as expected,
 not typical
 au-di-ble (adj.), able to be heard
 au-dio (adj.), pertaining to sound
 au-gend (n.), a number to which
 another is added; see addend
 aus-ten-ite (n.), a constituent of
 some types of steel made up of a
 solid solution of carbon in iron
 au-to-mate (v.), to change over to
 automatic production
 au-to-ma-tion (n.), the operation
 of machinery with a minimum of
 human operation, decision-
 making, or tending
 av-a-lanche (n.), a great rush of
 something, usually sudden
 avi-on-ics (n.), the science or
 study of electrical and electronic
 instruments used in flying vehicles
 ax-i-al (adj.), in the neighborhood
 of the axis of something, where
 the axis is a straight center line
 ax-i-om (n.), a proposition or
 statement considered to be true
 without proof
 ax-is (n., pl. axes), see axial
 ax-le (n.), the shaft on which a
 wheel rotates
 azide (n.), a group of chemical
 compounds containing an NH₃
 group
 az-i-muth (n.), a navigational
 or astronomical measurement
 azine (n.), a group of organic
 chemical compounds

B

Bab-bitt met-al (n.), an alloy
 used in parts that bear or
 wear on each other (as bearings)
 baf-fle (n.), a surface or other
 device used to deflect or regu-
 late the flow of something
 bal-ance (v.), to equalize in
 weight; in chemistry, to make
 two sides of an equation come
 out equal in terms of amounts
 used and valences

bal-last (n.), heavy material used in a vehicle of any sort in order to stabilize it

bal-lis-tics (n.), the study of any object in flight or its flight characteristics

band (n.), a range or spread of frequency or energy

bar-i-um (n.), a metallic chemical element, Ba

ba-rom-e-ter (n.), an instrument used to measure air pressure (an aid in weather forecasting) or height of ascent

bas-al (adj.), referring to a basic quality or to the base of something

ba-salt (n.), a kind of mineral or rock

base (n.), a class of chemical, also called an alkali; also the number to which an exponent or a logarithm is applied

ba-sic-ty (n.), the degree of alkalinity in a chemical solution

batch (n.), the quantity of something treated or processed at any one time

bath (n.), a liquid in a vessel for some specific purpose (as heating, cooling); the vessel containing the liquid

bat-tery (n.), a device which generates electricity as a result of a continuous chemical reaction; the device has two terminals, one positively charged, the other negatively charged

baux-ite (n.), a mineral

bea-con (n.), a radio transmitter that sends a signal used by aircraft or ships for guidance

bead (n.), the track or path of a weld joint in metals or plastics

bea-ker (n.), a cup-like container used in chemistry

beam (n.), a vertically supported horizontal member used in construction

bear-ing (n.), a structure used in machinery in which a pin or axle turns

beat (n.), the difference frequency between two frequencies

bell jar (n.), a dome-shaped chamber in which a vacuum or other gaseous environment may be produced; also a cover for something

bel-lows (n.), an extendible or expandable part, usually used for blowing or stretching (to increase a distance)

ben-zene (n.), an organic chemical used as a solvent or a fuel

ben-zene ring (n.), an arrangement of chemical bonds, in organic chemistry

ben-zol (n.), benzene; also a mixture of benzene with similar liquids

berke-li-um (n.), a radioactive element, Bk

ber-yl (n.), a mineral

beryl-li-um (n.), a metallic element, Be

be-ta (n.), the second letter of the Greek alphabet β , used as a symbol in physics and chemistry (beta-rays, etc.)

be-ta-tron (n.), an electron accelerator

bev-el (n.), an angle, made by two intersecting parts, which is other than a right angle

bi- (prefix), two, twice

bi-as (n.), a voltage impressed on a given point, particularly on the electrodes of a tube or transistor

bi-ax-i-al (adj.), having two axes

bib-li-og-ra-phy (n.), a list of books and/or articles on a given subject

bi-fi-lar (adj.), having two linear marks or threads, usually scribed or scratched on a lens

bi-fur-cate (v.), to divide into two branches

bi-met-al (n.), a strip made up of two different kinds of metal joined or layered onto each other

bi-me-tal-lic (adj.), see bimetal
 bi-na-ry (adj.), made up to two parts; also a numbering system
 bin-au-ral (adj.), relating to sound received from two directions
 bi-nis-tor (n.), a solid-state component with two leads
 bin-oc-u-lar (adj.), relating to receiving a light image from two lens systems, as with a telescope having a separate eyepiece for each eye
 bi-no-mi-al (adj.), a mathematical expression having two terms connected by a plus or minus sign
 bi-o-chem-is-try (n.), the science that involves the chemical reactions of living materials
 bio-lu-mi-nes-cence (n.), giving off light as a result of biological action; the light itself
 bi-phe-nyl (n.), a chemical radical; see diphenyl
 bi-re-frin-gence (n.), refraction of light through a system or substance in two separate directions to produce two rays
 bi-sect (v.), to cut into two separate parts, usually of equal size
 bis-muth (n.), a metallic element, Bi
 bisque (n.), a piece of hardfired unglazed ceramic
 bit (n.), the smallest possible piece of information in computer language, a choice between "yes" or "no"
 bi-va-lent (adj.), having a valence of two, i.e., a chemical element capable of taking on or giving off two ionic charges
 bleed-er (n.), an electronic circuit
 boil (v.), to go through a change of state from liquid to gas; to raise to the boiling point
 bo-lom-e-ter (n.), a sensitive thermometer
 bomb (n.), a chamber for containing compressed gases
 bom-bard (v.), to subject to particles or rays
 bond (n.), the force of attraction that holds atoms or ions together in chemical compounds
 bond-er-ize (v.), to coat metal with a chemical primer base
 boom (n.), a long strut or spar used in construction cranes
 bor-ane (n.), a chemical compound of boron and hydrogen
 bo-rate (n.), a salt containing boron
 bo-rat-ed (adj.), mixed or combined with borate
 bo-rax (n.), a chemical compound, essentially sodium borate
 bore (v.), to drill a hole
 bo-ron (n.), a metalloid element, B
 bort (n.), an imperfect diamond or diamond fragment used abrasively
 boss (n.), a projection
 brack-et (n.), one of the pair of marks used to enclose a chemical or mathematical expression that must be marked off as an entity
 brake (v.), to stop or slow down
 brass (n.), an alloy of the metals copper and zinc
 Bri-nell hard-ness (n.), a numerical measure of the hardness of metal
 Brit-ish ther-mal unit (n.), a unit of heat; Btu
 brittle (adj.), easily broken or cracked
 bro-mine (n.), a nonmetallic element, Br
 bronze (n.), an alloy of the metals copper and tin
 brush (n.), part of a motor or generator
 buff-er (v.), to add a substance capable of stabilizing the acid level of a solution
 Bun-sen burn-er (n.), a gas burner used in chemistry to produce a very hot, torchlike flame
 buoy-an-cy (n.), the tendency of an object to float in a liquid

bu-rette (n.), a glass tube marked
 off in cubic centimeters, used to
 measure out accurate quantities
 of liquid
 burr (n.), a sharp projection or
 roughness formed accidentally
 as a result of machining
 bu-ta-di-ene (n.), a flammable
 organic compound
 bu-tane (n.), a flammable organic
 compound
 bu-ta-nol (n.), an alcohol
 butt (n.), the heavier, thicker
 end of something; (v.), to
 place two things together, end
 to end
 butt weld (n.), the joint between
 two objects welded end to end
 bu-tyl (n.), a chemical radical
 bu-tyl-ene (n.), an organic
 compound

C

cad-mi-um (n.), a metallic
 element, Cd
 calc-, calci-, calco- (prefix),
 pertaining to calcium
 cal-car-e-ous (adj.), resembling
 the mineral calcite; containing
 calcium
 cal-ci-fer-ous (adj.), containing
 or producing calcium compounds
 cal-cine (v.), to heat in order
 to cause certain physical and
 chemical changes
 cal-cite (n.), a mineral containing
 calcium
 cal-ci-um (n.), a metallic element,
 Ca
 cal-cu-la-ble (adj.), able to be
 determined by calculation
 cal-cu-late (v.), to determine
 mathematically
 cal-cu-lus (n.), a branch of
 mathematics
 cal-i-ber (n.), the diameter of a
 round object or the inside
 diameter of a cylinder

cal-i-brate (v.), to determine
 exactly with reference to a
 standard the value of readings
 on a meter or some other device
 cal-i-for-ni-um (n.), a radioactive
 chemical, Cf
 cal-i-per or cal-i-pers (n.), an
 instrument for measuring small
 distances
 ca-lo-ric (adj.), related to heat
 cal-o-rie (n.), a unit of heat
 energy; the amount of energy;
 the amount of energy required to
 raise the temperature of one gram
 of water one degree centigrade;
 abbreviated cal
 cal-o-rif-ic (adj.), producing heat
 cal-o-rim-e-ter (n.), a device for
 measuring quantities of heat
 cam (n.), in machinery, a sliding
 part which controls the movements
 of other parts
 cam-ber (n.), a slight curvature
 cam-phor (n.), a crystalline organic
 compound
 can-dle-power (n.), a unit of light
 intensity
 can-ti-le-ver (n.), a structural
 beam that extends horizontally,
 held only at one end
 ca-pac-i-tance (v.), a quality of
 an electrical device that permits
 the storage of energy
 ca-pac-i-tor (n.), a component of
 an electrical system which can
 store electrical energy; also
 called a condenser
 ca-pac-i-ty (n.), the ability of
 a capacitor to store electrical
 energy
 cap-il-lar-i-ty (n.), the rising
 of a liquid in a small tube
 cap-il-lary (n.), a long narrow tube
 cap-sule (n.), a small closed
 container
 car-at (n.), a unit of weight used
 to measure precious stones, equal
 to one-fifth of a gram
 car-bide (n.), a chemical compound
 of carbon

car-bo-hy-drate (n.), a class of chemical compounds containing carbon, hydrogen, and oxygen
 car-bol-ic (adj.), referring to a class of chemicals; also called carbolic acid or phenol
 car-bon (n.), a nonmetallic element, C
 car-bo-na-ceous (adj.), containing carbon
 car-bon-ic (adj.), referring to carbon-containing compounds
 car-bon-if-er-ous (adj.), containing carbon
 car-bon-ize (v.), to dissociate a chemical compound of carbon, leaving uncombined carbon as a residue, see also carburize
 car-bon-yl (n.), a class of chemical compounds containing the radical CO
 car-box-yl (n.), a class of organic radicals
 car-boy (n.), a large cylindrical container for dangerous liquids
 car-bu-ret (v.), combining chemically with carbon
 car-bu-ret-or (n.), a device which measures and mixes a fuel with air
 car-bu-rize (v.), to impregnate a material with carbon; see also carbonize
 car-ri-er (n.), an electrical wave upon which signals are impressed (as modulation)
 Car-te-sian (adj.), referring to a system for making graphs
 cas-cade (adj.), a series; (n.), an electronic circuit
 case (n.), a skin or surface
 ca-sein (n.), a chemical compound produced from milk
 cast (v.), to shape liquid or a semisolid in a mold so that the solid material which results takes on the shape of the mold
 cast-ing (n.), an item which has been cast
 ca-tal-y-sis (n.), the process in which a chemical reaction is speeded up by the presence of a material that does not itself enter into the reaction

cat-a-lyst (n.), substances which can produce catalysis
 cat-a-lyze (v.), see catalysis
 cat-e-go-rize (v.), to put into a group or classification
 cat-e-go-ry (n.), a group or classification
 cat-e-na-ry (n.), the shape of a flexible line or cord when it is held loosely between two points
 cath-ode (n.), the negative electrode of a battery; the electrode that emits electrons in a vacuum tube
 ca-thod-ic (adj.), pertaining to the cathode
 ca-thod-o-lu-mi-nes-cence (n.), light resulting from electron impact
 cat-ion (n.), a positively charged ion, attracted toward the negative electrode (cathode)
 caulk (v.), to fill up a hole to prevent leakage
 caus-tic (adj.), having alkaline qualities, a chemical; corrosive
 cell (n.), the smallest functional unit of an organized mechanism or structure, a small enclosure
 cel-lu-lar (adj.), consisting of or related to cells
 cel-lu-lose (n.), a carbohydrate in plant cell walls
 ce-ment (n.), a material that binds particles together
 ce-ment-ite (n.), a constituent of steel
 centi- (prefix), referring to a hundred or a hundredth
 cen-ti-grade (adj.), referring to a temperature scale where the range between the freezing and boiling points of water is divided into a hundred equal parts
 cen-ti-me-ter (n.), a unit of distance in the metric system, a little less than a half inch
 cen-trif-u-gal (adj.), referring to a direction away from the center
 cen-tri-fuge (n.), a machine that makes use of centrifugal force, rotating solutions in a circle to separate substances of differing weights

cen-trip-e-tal (adj.), referring to a direction toward the center
 ce-ram-ics (n.), the technology of making structures out of clay and like materials
 ce-ram-ist or ce-ram-i-cist (n.), one who works in ceramics
 ce-ri-um (n.), a metallic element, Ce
 cer-met (n.), an alloy of a heat-resistant substance and a metal
 cer-ti-fy (v.), to claim that something is true, in the sense of guarantee
 ce-si-um (n.), an alkali metallic element, Cs
 ce-tane (n.), a hydrocarbon found in petroleum
 cgs (adj.), abbreviation for centimeter-gram-second system of measurement (also known as the metric system)
 chan-nel (n.), a U- or V-shaped groove in a metal bar; a frequency band for radio or television
 chan-nel-ize (v.), to direct a certain way
 cha-os (n.), a confusion, with no order or regularity
 char (v.), to burn partly
 char-ac-ter-is-tic (n.), a particular distinguishing quality or trait
 charge (n.), the amount of voltage on a point; (v.), to place voltage on a point
 chas-sis (n.), the metal frame or shelf on which electrical circuit components are mounted
 che-late (v.), a variety of chemical reaction
 chem-i-lu-mi-nes-cence (n.), light resulting from a chemical reaction
 chi (n.), a letter of the Greek alphabet; used as a symbol in mathematics
 chip (n.), a small fragment; (v.), to break off small fragments

chis-el (n.), a tool with a wedge-shaped cutting or hacking edge
 chlo-rine (n.), a nonmetallic element, Cl
 chlo-ro-form (n.), a toxic organic solvent containing chlorine
 chlo-ro-phyll (n.), the green photosynthetic chemical, naturally occurring in plants
 choke (n.), a coil used to provide inductance in an electronic circuit
 chop-ping (n.), an electronic circuit
 chro-mat-ic (adj.), relating to color
 chro-mi-um (n.), a metallic element, Cr
 chro-no-log-i-cal (adj.), in regular time sequence
 chro-nom-e-ter (n.), a very accurate instrument for measuring time
 cin-der (n.), residue, ash, or slag after burning
 ci-pher (n.), zero, denoting absence of magnitude or quality
 cir-cuit (n.), a path ending where it started, an electrical setup consisting of the conventional electrical components and performing a given electrical function
 cir-cu-i-tous (adj.), indirect, roundabout
 cir-cuit-ry (n.), the study or plans of electric circuits
 cir-cum-scribe (v.), to enclose by a circle or boundary
 cir-cum-vent (v.), to avoid or check
 cite (v.), to quote, generally as an authority
 cit-ric (adj.), referring to an organic acid
 clad (adj.), covered with a metallic sheet, metal bonded on metal
 clad-ding (n.), the clad metal sheath
 clamp-ing (n.), an electronic circuit

clear-ance (n.), the space by which objects are separated from each other
 cleav-age (n.), the ability of a mineral or a crystal to be split along a (crystal) plane
 cleave (v.), see cleavage
 co-ag-u-lant (n.), a substance or process producing coagulation
 co-ag-u-la-tion (n.), the clustering together in a jelly-like mass of particles in a suspension
 co-ax-i-al (adj.), two or more structures having the same axis
 co-balt (n.), a metallic element, Co
 co-ef-fi-cient (n.), a number describing the quantity of something and written as part of that thing
 co-er-civ-i-ty (n.), an attribute of a magnetizable material
 co-ex-ten-sive (adj.), sharing the same space and extending to the same limits
 cog (n.), a tooth on a gear or wheel
 co-here (v.), to stick together firmly
 co-her-ence (n.), see cohere
 co-her-ent (adj.), consistent; also light beams whose waves act together (in phase)
 co-he-sion (n.), the state of cohering
 coil (n.), a spiral-wound wire
 coin (v.), to make a pattern in metal by pressing or stamping
 co-in-ci-dent (adj.), occupying the same space or occurring at the same time
 co-lin-e-ar (adj.), lying in the same straight line
 col-late (v.), to compare carefully; also to set in order
 col-lat-er-al (adj.), parallel
 col-lec-tor (n.), the electrode that collects electrons to ions; also the anode of a transistor
 col-li-mate (v.), to make rays of light parallel

col-li-ma-tor (n.), a device to produce the effect of parallel rays of light
 col-loid (n.), a suspension of extremely fine particles
 col-loi-dal (adj.), see colloid
 col-or-im-e-ter (n.), an instrument used to discriminate between colors
 Col-pitts (n.), an electronic circuit
 co-lum-bi-um (n.), a metallic element, Cb; also called niobium
 col-umn (n.), a vertical structural member
 col-um-nar (adj.), in columns or rows
 com-bus-tion (n.), the act of reacting rapidly with oxygen: oxidation, burning
 com-mon (adj.), shared
 com-mu-ta-tor (n.), part of an electrical motor; also a switch
 com-pact (v.), to press into a limited space, to increase in density; (n.), a pressed mass
 com-pa-ra-tor (n.), an instrument used to compare sizes and shapes of objects
 com-part-men-tal-ize (v.), to separate into groups or categories
 com-pat-i-ble (adj.), able to exist together without damage
 com-pen-sate (v.), to counter-balance or neutralize
 com-plex (adj.), in mathematics, the sum of a real and an imaginary number; also a more-than-simple grouping
 com-pli-ant (adj.), yielding easily into a required shape or condition
 com-po-nent (n.), a part of something; also a device used in electronics; also a vector
 com-pound (n.), a chemical formed by the combination of two or more other chemicals (elements, radicals)
 com-press (v.), to squeeze or flatten
 com-pres-sion (n.), see compress

com-prise (v.), to make up,
 constitute
 com-pute (n.), to calculate
 com-put-er (n.), a machine for
 calculating
 con-cave (adj.), rounded inward
 con-cav-i-ty (n.), a concave surface
 con-cen-trate (v.), to make less
 dilute, make more intense
 con-cen-tra-tion (n.), the strength
 of a solution referring to the
 amount of a specified component
 con-cen-tric (adj.), having the
 same center point
 con-crete (adj.), real; also formed
 by a solid particulate mass
 con-cur-rent (adj.), happening at
 the same time
 con-den-sate (n.), material that
 condenses
 con-den-sa-tion (n.), the physical
 change where material in vapor
 form changes to liquid or solid
 con-dens-er (n.), an apparatus for
 condensing; also a capacitor
 con-duct (v.), to serve as a medium
 in which movement of material or
 electrons can occur
 con-duc-tance (n.), the capacity
 for conduction
 con-duc-tiv-i-ty (n.), the measure
 of an object's conductance
 con-duc-tor (n.), a medium in which
 conduction occurs
 cone (n.), a geometrical figure,
 circular at the bottom and coming
 to an evenly tapered point
 con-fig-u-ra-tion (n.), arrangement
 of parts
 con-form (v.), to agree with or be
 similar to
 con-gru-en-cy (n.), the state of
 being identical in size and shape;
 coincidence
 con-ic (n.), a piece cut from a
 cone; (adj.), relating to a cone
 con-jec-ture (n.), a guess
 con-ju-gate (adj.), joined together
 con-junc-tion (n.), something which
 has been joined together from
 parts

con-se-quence (n.), resulting from
 a cause or a certain condition
 con-ser-va-tion (n.), the act of
 saving or preserving
 con-serve (v.), see conservation
 con-sis-tent (adj.), in agreement
 with other factors; also of a
 firm or coherent nature
 con-sol-i-date (v.), to bring
 together into a single unit
 con-stant (n.), a number or
 condition that does not change
 while one or more others do
 con-stit-u-ent (n.), a component,
 part, or element
 con-straint (n.), an imposed limit
 con-strict (v.), to squeeze or draw
 together
 con-sum-e (v.), to use up or use
 fully
 con-tent (n.), that which is
 contained
 con-ti-gu-ity (n.), the state of
 being next to and touching
 con-tig-u-ous (adj.), see contiguity
 con-tin-gent (adj.), depending on
 something else
 con-tin-gen-cy (n.), something
 that may happen
 con-ti-nu-i-ty (n.), something
 that keeps happening without
 interruption
 con-tin-u-um (n.), the same
 continuous thing or happening
 con-tour (n.), outline
 con-tract (v.), to become smaller
 con-vec-tion (n.), the movement
 of a gas or liquid in a roughly
 circular path
 con-verge (v.), to come together
 con-ver-gence (n.), see converge
 con-vex (adj.), rounded outward
 cool-ant (n.), a cooling agent
 co-or-di-nate (n.), a set of numbers
 or variables used to show the
 position, state, or motion of
 something in space
 co-pol-y-mer (n.), a molecule which
 is the result of polymerizing
 other molecules together

cop-per (n.), a metallic element, Cu
 cor-ol-lar-y (n.), something that follows naturally from a preceding argument
 co-ro-na (n.), a glowing region that surrounds an object, as a glow on a conductor at high voltage
 cor-pus-cu-lar (adj.), in separate particles
 cor-re-late (v.), to show the relationship between
 cor-re-spon-ding (adj.), equivalent or parallel
 cor-rob-o-rate (v.), to make a position stronger by presenting supporting data
 cor-rode (v.), to eat away a material, usually with a chemical
 cor-ru-gat-ed (adj.), shaped in regular ridges and grooves
 co-sec-ant (n.), the trigonometric ratio of the hypotenuse over the side opposite an angle in a right triangle
 co-sine (n.), the trigonometric ratio of the side adjacent over the hypotenuse of an angle in a right triangle
 cos-mic ray (n.), a stream of atomic nuclei from outer space
 cost-plus (adj.), a contractual payment based on the cost with a fee added on
 co-tan-gent (n.), the trigonometric ratio of the side adjacent over the side opposite an angle of a right triangle
 cot-ter pin (n.), a pin used to fasten parts of machinery
 cou-lomb (n.), the number of electrons moved in one ampere of electrical current in one second
 count-er (adv.), against, opposed to
 coun-ter-bal-ance (v.), to offset
 coun-ter-clock-wise (adv.), in a direction opposite to that in which the hands of a clock move
 coun-ter-sink (v.), to drill a hole to leave space to accommodate the head of a screw

count-ing (n.), an electronic circuit
 co-va-lent (adj.), referring to atoms that join together by reason of shared electrons
 craze (v.), to produce a network of fine cracks on a surface
 creep (n.), the slow changing of shape of a material
 cre-o-sote (n.), a liquid chemical used in preserving
 cres-cent (n.), arc shaped
 cross hair (n.), a thread or wire in an optical system used as a reference line
 cross sec-tion (n.), the surface of something exposed when it is cut through at a right angle to its axis
 cross-talk (n.), electrical interference in a communication line
 cru-ci-ble (n.), a container with high heat-resistance used for melting materials
 crude (adj.), not refined or processed chemically
 cry-o-gen-ics (n.), the science of very low temperatures
 cryo-stat (n.), equipment used to maintain very low temperatures
 crys-tal (n.), a type of formation where the atoms occur in a regular (periodic) arrangement
 crys-tal-lize (v.), to produce a crystal or crystals
 crys-tal-log-ra-pher (n.), one who studies crystals
 crys-tal-log-ra-phy (n.), the science of crystals
 cube (n.), a solid made up of six sides of equal size at right angles to each other; (v.), to raise to the third power
 cu-bic (adj.), see cube
 cu-bic cent-i-me-ter (n.), a metric system measure of volume equal to 0.06 cubic inch
 cull (n.), a reject piece; (v.), to select and separate out the good from the bad
 cum (prep.), with

cu-mu-la-tive (adj.), to add up with successive additions
 cu-pric (adj.), relating to copper
 cu-rie (n.), a unit to measure radioactivity, cu, Cu, Ci
 cu-ri-um (n.), a radioactive element, Cm
 curl (n.), a mathematical operation with vectors
 cur-rent (n.), a flow; in electricity, of electrons
 cur-tail (v.), to shorten
 cur-vi-lin-ear (adj.), referring to a curved line or boundary
 cush-ion (v.), to protect against shock; (n.), a structure to protect against shock
 cusp (n.), a sharp point made by two intersecting curves
 cut-off (n.), the point at which an electric circuit ceases to work
 cy-an-a-mide (n.), an acidic compound of cyanide
 cy-a-nide (n.), a salt of hyrdocyanic acid
 cy-cle (n.), a complete sequence that repeats itself; (v.), to repeat regularly
 cy-clic (adj.), see cycle
 cyc-loid (n.), a particular shape of curve
 cy-clo-tron (n.), a machine that accelerates atomic particles
 cyl-in-der (n.), geometrically, an object shaped like a round, straight-walled tube
 cy-lin-dri-cal (adj.), see cylinder

D

damp (v.), to restrain or check vibration
 da-tum (n. sing., pl: data), a piece of factual information, usually quantitative
 de-cal-ci-fy (v.), to remove calcium from

de-cant (v.), to pour liquid from one container to another leaving lower liquid levels or solid matter behind
 de-car-bon-ize (v.), to remove carbon from
 de-car-bur-ize (v.), to remove carbon from a metal, usually steel
 de-cel-er-ate (v.), to lessen speed
 deci-bel (n.), a unit for measuring the loudness of sound or the voltage of an electrical signal; db
 dec-i-mal (n.), fraction expressed in powers of ten
 dec-li-na-tion (n.), an angle pointing downward
 de-code (v.), to convert a coded message to ordinary language
 de-com-pose (v.), to break up a compound into its constituent parts
 de-com-press (v.), releasing pressure
 de-con-tam-i-nate (v.), to be rid of contamination
 de-duce (v.), to draw conclusions from data or a general principle
 de-fer (v.), to put aside, to delay
 de-flate (v.), to release gas from
 de-flect (v.), to turn aside
 de-form (v.), to alter the shape of something
 de-for-ma-tion (n.), the act or state of being deformed
 de-gauss (v.), to demagnetize
 de-gen-er-ate (adj.), having lower standards or at a lower standard
 de-gen-er-a-ting (n.), an electronic circuit
 de-gen-er-a-tion (n.), deterioration
 de-grade (v.), in chemistry, to make simpler; also to wear down
 de-gree (n.), unit of temperature; also a relative level

de-hy-drate (v.), to remove water
 de-lay line (n.), an electronic circuit that builds in lag in phase of a wave
 del-e-te-ri-ous (adj.), harmful
 de-lete (v.), to remove
 de-lim-it (v.), to impose boundaries or limits
 del-i-ques-cence (n.), said of a material which takes up available water or water vapor, becoming moist or dissolving
 del-ta (n.), the fourth letter of the Greek alphabet used as a symbol for an increment involving a changing factor; also: an electronic circuit
 del-ta star (n.), an electronic circuit
 del-ta wye (n.), an electronic circuit
 demi- (prefix), partly or half
 de-mod-u-late (v.), to remove a modulating electrical signal from a carrier wave
 de-mon-strate (v.), to show, prove, or illustrate
 den-drite (n.), a crystalline constituent in alloys
 de-nom-i-na-tor (n.), the below-the-line number in a fraction
 den-si-tom-e-ter (n.), an instrument used to measure the darkness of regions in a photographic film, used in X-ray diffraction or spectrographic analysis
 den-si-ty (n.), the weight of a unit volume of a material
 de-ox-y-ge-nate (v.), to remove oxygen from
 de-pen-dence (n.), the relationship in which the condition of one factor is determined by another factor
 de-plete (v.), to use up, to make less
 de-po-lar-ize (v.), to remove or prevent polarity
 de-press (v.), to cause to flatten vertically; also to lessen

de-riv-a-tive (n.), the mathematical function that is the result of differentiating; also the result of a chemical process
 de-salt (v.), to remove salt
 de-sign (n.), a plan derived from a concept
 de-sorb (v.), to release an adsorbed or absorbed gas from a material
 de-tail (v.), to add the fine points to a design
 de-tec-tion (n.), demodulation of an electrical signal
 de-tec-tor (n.), a kind of electronic circuit
 de-ter-mi-nant (n.), an array of numbers used in carrying out a mathematical manipulation
 det-o-nate (v.), to cause to explode
 deu-te-ri-um (n.), an isotope of the element hydrogen
 de-vi-ate (v.), not conforming to a norm; to cause deviation
 de-vice (n.), a gadget
 de-vise (v.), to conceive; to invent
 Dew-ar flask (n.), a flask that keeps its contents hot or cold
 dew point (n.), the temperature at which vapor in a gas condenses to moisture on a surface
 dex-trose (n.), an organic compound, a sugar
 di- (prefix), two
 di-ag-no-sis (n.), analysis of the cause of a condition
 di-ag-on-al (n.), a straight line connecting two corners of a geometrical figure
 di-a-gram (n.), a line drawing
 di-al-y-sis (n.), the process of separating particles in solution from each other
 di-a-mag-net-ic (adj.), describing the magnetizability of a material
 di-a-met-ric (adj.), completely opposite to
 di-a-phragm (n.), a thin, flexible disc; a partition
 dia-ther-my (n.), generating heat in organic materials by electrical means

di-atom-ic (adj.), consisting of
 . two atoms
 di-chot-o-my (n.), a division into
 two parts
 di-chro-ism (n.), color changes
 in a material by transmitted
 light as through a crystal or
 layers of varying thickness, or
 with changes in solution
 concentration
 die (pl. dice) (n.), a small,
 cubicle object; also a tool used
 to give a desired shape to a
 material
 di-elec-tric (n.), a nonconductor
 of electricity, a fundamental
 part of the condenser or capacitor
 die-sel en-gine (n.), a kind of
 internal combustion
 dif-fer-en-tial (n.), an increment
 or difference in amount between
 two quantities, a term used
 in calculus
 dif-fer-en-ti-ate (v.), to perform
 a mathematical operation which
 shows how one function varies
 with another
 dif-fer-en-ti-at-ing (adj.), a kind
 of electronic circuit
 dif-frac-tion (n.), an effect
 produced on light rays passing
 through narrow slits
 dif-fuse (adj.), all spread out;
 (v.), to undergo diffusion; see
 diffusion
 dif-fu-sion (n.), the intermingling
 of particles; an equalizing of
 physical states thereby
 di-ges-tion (n.), the breaking down
 of materials by solution and
 chemical reaction
 dig-it (n.), any number from 0 to 9
 dig-i-tal (adj.), involving the
 use of numbers
 di-he-dral (adj.), made up of
 two intersecting planes
 di-late (v.), to spread wide
 di-la-tom-e-ter (n.), instrument
 to measure expansion
 di-lute (v.), to make thinner or
 less concentrated
 di-men-sion (n.), measurement of
 size in one direction
 dim-mer (n.), a device for making
 light less intense
 di-mor-phic (adj.), having the
 qualities of two kinds of things
 at once
 dim-ple (n.), a small indentation;
 (v.), to make a small indentation
 di-ode (n.), a type of tube having
 two terminals; a semiconductor
 rectifier
 di-op-ter (n.), a unit of measure
 of the power of a lens to bend
 light rays
 di-ox-ide (n.), an oxide containing
 two atoms of oxygen
 di-phe-nyl (n.), a chemical radical;
 see biphenyl
 di-plex (adj.), relating to two
 electromagnetic signals being
 sent together
 di-pole (n.), a usually small, or
 atomic size object having its
 two ends oppositely charged with
 static electricity or oppositely
 magnetized
 di-rect cou-pled (adj.), referring
 to a type of electronic circuit
 di-rect current (n.), an
 electrical current that
 flows in one direction only;
 d-c
 dis-as-so-ci-ate or dis-so-ci-ate
 (v.), to separate into its
 constituents
 disc (n.), see disk
 dis-charge (v.), to release poten-
 tial voltage or energy; to remove
 a charge; (n.), the action that
 results from the release of
 voltage or energy
 dis-crete (adj.), separate, not
 continuous (not to be confused
 with "discreet," meaning having
 good judgment)
 dis-crim-i-nate (v.), to notice
 the difference between things
 dis-crim-i-na-tor (n.), a device,
 usually an electric circuit,
 that discriminates

dis-in-te-grate (v.), to break
 into fragments
 disk (n.), a flat, round object
 dis-lo-ca-tion (n.), a defect in
 crystal regularity
 dis-or-dered (adj.), without
 regularity
 dis-ori-ent (v.), to cause to lose
 position or relationship
 dis-pense (v.), to give out in
 measured quantities
 dis-perse (v.), to cause to
 separate and spread out
 dis-per-sion (n.), a dispersed
 material
 dis-pro-portion-ate (adj.), out
 of proportion
 dis-sect (v.), to cut up for
 examination; to analyze
 dis-si-pate (v.), to cause to
 break up and disappear
 dis-so-ci-ate (v.), see disassociate
 dis-solve (v.), to cause something
 to break up or go into solution
 or both
 dis-till (v.), the process of
 boiling a liquid to its vapor and
 then recondensing the vapor to
 a liquid in order to purify it
 dis-til-late (n.), the resulting
 product of the process of
 distillation
 dis-tor-tion (n.), an abnormal
 change in shape
 dis-trib-ute (v.), to spread out
 dis-tri-bu-tion (n.), the way
 something is spread out, in-
 dicating exactly how much of it
 is in each place
 di-ver-gence (n.), a spreading
 apart
 di-vert (v.), to turn aside
 di-vide (v.), to separate into
 parts
 di-vid-end (n.), a number that is
 to be divided
 di-vid-ers (n.), an instrument,
 resembling a compass, that
 consists of two sharp points
 hinged together

di-vi-sor (n.), the number by which
 the dividend is divided
 do-deca- (prefix), twelve
 do-main (n.), a sphere of influence;
 also a basic magnetic region
 do-nor a source of a material;
 a source of electrons in semi-
 conductors
 dop-ant (n.), the material added in
 doping; the doping agent
 dope (v.), to add a small amount
 of something
 dop-pler (adj.), a type of elec-
 tronic circuit
 Dopp-lér effect (n.), changes in
 wave frequency (sound or light)
 as the wave source moves
 dor-mant (adj.), quiescent
 do-sim-e-ter (n.), an instrument
 for measuring the amount of
 exposure to X-rays
 doub-ler (n.), a kind of electronic
 circuit
 dou-blet (n.), a pair of identical
 objects
 dow-el (n.), a pin of wood or
 metal that fits into a particular
 hole
 DPDT (adj.), double pole, double
 throw; a type of electric switch
 DPST (adj.), double pole, single
 throw; a type of electric switch
 dregs (n.), sediment or sludge
 remaining in a container after
 liquid has been drained or
 decanted off
 drone (n.), a pilotless vehicle
 du-al (adj.), referring to an
 object that consists of two parts
 duo- (prefix), two
 du-plex (adj.), double
 du-ra-tion (n.), the amount of
 time that something lasts
 dy-nam-ic (adj.), active
 dy-nam-ics (n.), a branch of
 mechanics dealing with
 movement
 dy-na-mo (n.), a generator of
 electricity
 dy-na-mom-e-ter (n.), an instru-
 ment for measuring mechanical
 force

dy-na-tron (n.), a type of vacuum tube
 dyne (n.), a unit of force
 dyne cen-ti-me-ter (n.), a unit of energy
 dy-node (n.), a part of a type of vacuum tube
 dys-pro-si-um (n.), a chemical element, Dy

E

e- (prefix), out, not
 ec-cen-tric (adj.), not following a circular path; having a center different from that of a related sphere
 ech-e-lon (n.), a grade or level
 echo (n.), a reflected sound
 eclipse (n.), the obscuring of an object by another object of its shadow
 ed-dy (n.), a circular current
 ef-fer-vesce (v.), to bubble out
 ef-fi-cien-cy (n.), a measure of the amount of production of an effort
 ef-flo-resce (v.), to lose water to the extent that a substance crumbles into powder
 ef-flu-ence (n.), that which flows out
 ein-stein-i-um (n.), a chemical element, Es
 e-ject (v.), to cast out from within with force
 elab-o-rate (adj.), with great detail
 elas-tic (adj.), able to resume its original shape after stretching
 elas-tic-i-ty (n.), see elastic
 elas-to-mer (n.), one of a class of elastic, rubbery materials
 el-bow (n.), a piece of pipe having a right angle
 elec-tric-i-ty (n.), the phenomenon relating to charged particles and their movement

elec-tro- (prefix), referring to electricity
 elec-tro-chem-is-try (n.), the science dealing with the interaction of electricity and chemicals
 elec-trode (n.), a metallic contact point of an electric circuit; a basic element of an electrical component
 elec-tro-form (v.), to form structures by building up metal by electroplating
 elec-to-lu-mi-nes-cence (n.), voltage-produced light
 elec-trol-y-sis (n.), producing an electric current through an electrolyte to effect chemical change
 elec-tro-lyte (n.), a chemical solution which conducts electric current by means of ions
 elec-tro-lyze (v.), to subject to electrolysis
 elec-tro-mag-net (n.), a magnet operating as a result of an electrical current passing through it
 elec-trom-e-ter (n.), an instrument used to measure small voltages
 elec-tro-mo-tive (adj.), relating to the voltage force that moves electrons
 elec-tron (n.), a basic sub-atomic particle having a negative charge and essentially no weight
 elec-tron-ics (n.), the science dealing with the behavior of electrons
 elec-tro-pho-re-sis (n.), the movement of particles in a liquid suspension by means of electrical forces
 elec-tro-plate (v.), the deposition of metal on an electrode by electrochemical processes
 elec-tro-stat-ics (n.), the science dealing with the behavior of electrical charges without continuous current flow

elec-tro-ther-mal (adj.), relating to the production of heat by electrical means

el-e-ment (n.), one of 103 basic constituents of matter that ordinarily cannot be subdivided; also a basic part

el-e-men-ta-ry (adj.), simple, basic

el-e-va-tion (n.), a kind of drawing made by a draftsman; also altitude

elu-tri-ate (v.), to remove by washing

em-a-na-tion (n.), that which is sent out of something

em-bed (v.), to enclose an object in another substance

em-boss (v.), to raise a surface in desired places for ornamental or other purposes

em-bryo (n.), the early and undeveloped state of something

em-ery (n.), an abrasive powder used in grinding and polishing

emf (n.), abbreviation for electromotive force

emis-sion (n.), the act of sending material out from within

emis-siv-i-ty (n.), the ease with which something is emitted

em-pha-sis (n.), the giving of particular importance to something

em-pir-i-cal (adj.), based upon actual experimental data and observation

emul-si-fy (v.), see emulsion

emul-sion (n.), a liquid in which tiny droplets of another liquid are suspended

enam-el (v.), to form a glassy layer on metal; (n.), a glassy layer which may be formed on metal

en-cap-su-late (v.), to enclose in a capsule or packaging structure

en-code (v.), to convert information into a code, usually for computer programming

en-do-ther-mic (adj.), a chemical reaction in which heat is absorbed

en-er-gy (n.), the capability of doing work

en-gine (n.), a machine that converts one form of energy usually into mechanical energy

en-gi-neer-ing (n.), the science of making use of the properties of materials and of energy

en-grave (v.), to cut a pattern into a surface

en-hance (v.), to heighten, to intensify

enig-ma (n.), something difficult to understand

enig-mat-ic (adj.), see enigma

en-thal-py (n.), a measure of the amount of heat involved in any chemical or physical change, ΔH

en-ti-ty (n.), something that is complete in itself

en-tro-py (n.), a thermodynamic quantity relating to the amount of disorder in a system, ΔS

en-ve-lope (n.), that which surrounds and encloses

en-vi-ron-ment (n.), all the factors and materials that surround something

epi- (prefix), after, outer

ep-i-isode (n.), an occurrence complete in itself

epit-o-me (n.), a summary or an ideal

ep-oxy (n.), a type of arrangement of oxygen atoms in a chemical compound, usually a plastic

ep-si-lon (n.), a Greek letter, ϵ

equal-ize (v.), to make equal

equate (v.), to treat mathematically as equals

equa-tion (n.), a mathematical or chemical statement that shows the relationship between two things

equi- (prefix), equal

equi-an-gu-lar (adj.), having equal angles

equi-lat-er-al (adj.), having equal sides

equi-lib-ri-um (n.), a condition of balance which tends to remain stable

equi-po-ten-tial (adj.), having the same voltage

equiv-a-lent (adj.), virtually identical, having the same significance; also a kind of electronic circuit

equiv-o-cal (adj.), uncertain

equiv-o-cate (v.), to take an uncertain position

erad-i-cate (v.), to remove completely

er-bi-um (n.), a chemical element, Er

erg (n.), a unit of work

er-go (adv), therefore

erode (v.), to wear away

ero-sive (adj.), having the ability to erode

er-ra-ta (n.pl., sing: erratum), list of errors accompanying a publication or appearing in a subsequent issue

er-rat-ic (adj.), following no predictable course, eccentric

erupt (v.), to burst forth

es-pouse (v.), to support

ester (n.), an organic chemical grouping

es-tim-ate (n.), a detailed analysis and appraisal

eta (n.), a Greek letter, η

etch (v.), to dissolve away some of the surface of a material

eth-ane (n.), a chemical compound

eth-a-nol (n.), an alcohol

eth-ene (n.), a chemical compound

ether (n.), a chemical compound

ethyl (n.), a chemical radical

eth-yl-ene (n.), a chemical radical; also a chemical compound

Eu-clid-e-an (adj.), referring to the geometry of Euclid, conventional geometry

eu-ro-pi-um (n.), a chemical element, Eu

eu-tec-tic (n.), the lowest melting point of an alloy system

evac-u-ate (v.), to empty, to create a vacuum

evap-o-rate (v.), to dissipate as a vapor, to cause to vaporize

ex- (prefix), out, former

ex-ci-ta-tion (n.), the state in which certain atomic or quantum phenomena occur

ex-e-cute (v.), to carry out, perform

ex-fo-li-ate (v.), to grow by spreading leaves, sheets, or laminae; to unfold

ex-haust (v.), to empty, to evacuate; (n.), a gas that is given off

ex-hib-it (n.), a display for illustrating a point

ex-o-ther-mic (adj.), referring to chemical reactions that give off heat

ex-pan-sion (n.), increase in size

ex-pan-siv-i-ty (n.), expansion of a unit-sized piece of material

ex-pe-di-ent (adj.), makeshift, done to achieve an end

ex-pel (v.), to eject

ex-pend (v.), to use up

ex-per-i-ment (n.), test or trial carried out under controlled conditions

ex-per-tise (n.), expertness

ex-plor-ato-ry (adj.), relating to a search or examination

ex-po-nent (n.), a number written half a line above a mathematical symbol to show a power or root

ex-pression (n.), a mathematical statement (usually in the form of an equation)

ex-tra- (prefix), outside

ex-tract (v.), to get something out of something, as to extract a metal from ore

ex-trap-o-late (v.), to project or extend (a line on a graph or an idea)

ex-trem-i-ty (n.), a farthermost part

ex-trin-sic (adj.), outside, not forming part of

ex-trude (v.), to push through to shape, as toothpaste is squeezed from a tube

eye-piece (n.), the lenses nearest the eye in an optical instrument such as a microscope or telescope

F

- fac-et (n.), a small plane face on a crystal
- fac-tor (n.), a number or algebraic expression that is multiplied by one or more others; (v.), to separate a number or expression into the fundamental quantities that equal it when multiplied together.
- fac-to-ri-al (n.), the product of all the positive whole numbers from one to a given number
- Fahr-en-heit (adj.), the temperature scale in common use on which the freezing point of water is 32° and the boiling point of water is 212°; referred to as °F
- fa-rad (n.), a unit of capacitance
- far-a-day (n.), a unit used in electrolysis
- fat-ty ac-id (n.), a type of organic compound
- fault (n.), a defect or discontinuity in a mineral deposit or in a crystal
- fea-si-bil-i-ty (n.), the likelihood that something—a theory, a machine, or an experiment—will work
- feed-back (n.), influence of an electrical signal on a preceding circuit; also a type of electronic circuit
- fer-men-ta-tion (n.), a type of chemical reaction
- fer-mi-um (n.), an iron radical
- ferri- (prefix), relating to iron
- ferric (adj.), relating to iron
- fer-rite (n.), a type of magnet; also a group of iron compounds
- ferro- (prefix), relating to iron
- fer-ro-mag-net-ic (adj.) strongly magnetic
- fer-rous (adj.), relating to iron
- fer-rule (n.), a ring of metal placed around a shaft
- fi-ber (n.), a structure that is threadlike in shape
- fi-brous (adj.), see fiber
- field (n.), a region in which a force acts
- fil-a-ment (n.), a threadlike structure (often one used to conduct electricity)
- fi-lar (adj.), of or relating to a filament
- film (n.), a thin layer
- fil-ter (n.), an apparatus to separate solids from liquids; a type of electronic circuit
- fil-trate (n.), the liquid passed through a filter
- fin (n.), a flat projection
- fi-nite (adj.), having definable limits
- fis-sile (adj.), referring to something that can be split or divided
- fis-sion (n.), see fissionable
- fis-sion-able (adj.), splitting of an atomic nucleus to release energy; see fissile
- flint (n.), a very hard form of the mineral quartz
- flip-flop (n.), a kind of electronic circuit
- floc (n.), a cluster of particles
- floc-cu-la-tion (n.), the separation of particles according to their abilities to cluster and sink
- flow chart (n.), a diagram showing the movement of material through a process (generally a manufacturing process)
- fluc-tu-a-tion (n.), a back-and-forth variation
- flu-id (n.), a gas or liquid
- flu-id-i-ty (n.), a measure of the "runniness" of a material
- flu-o-res-cence (n.), the emission of light from a material as a result of its being hit by some kind of radiation
- flu-o-rine (n.), a chemical element, F
- flux (n.), the rate of transfer of energy across a surface (often used in discussing electric and magnetic fields)
- f-m (n.), frequency modulation
- foam (n.), froth

fo-cal (adj.), of or relating to a focus
fo-cus (n.), a point at which rays converge and meet
fog (n.), a fine mist
foil (n.), a very thin piece of metal
foot-pound (n.), a unit of work equal to that done in moving one pound of substance a distance of one foot
force (n.), a push
forge (v.) to form or shape a piece of metal by hammering it when it is hot
for-mal (adj.), done exactly according to accepted procedure
for-mu-la (n.), a mathematical or chemical expression written, using the symbols of mathematics and chemistry
for-tu-i-tous (adj.), accidental
fran-ci-um (n.), a chemical element, Fr
fray (v.), to wear
freez-ing point (n.), the temperature at which a liquid changes to a solid; also the temperature at which the solid and liquid may exist together
French curve (n.), a device used in drafting
fre-quen-cy (n.), the number of cycles that a repeating phenomenon makes in a given time interval
fri-a-ble (adj.), easily crumbled
fric-tion (n.), the resistance to movement offered by two surfaces being rubbed together
fringe (n.), an edge; also a dark band observed in optics
frit (n.), powdered glass
fron-tal (adj.), at the front
fu-gac-i-ty (n.), a thermodynamic property of a gas
ful-crum (n.), the point around which a lever rotates
fume (n.), a smoke or vapor
func-tion (n.), a mathematical expression that shows how one variable changes as a result of changes in another
func-tion-al (adj.), working, performing
fun-da-men-tal (adj.), basic
fu-tile (adj.), serving no purpose, waste

G

gad-o-lin-i-um (n.), a chemical element, Gd
gain (n.), a measure of electrical amplification
ga-le-na (n.), a mineral crystal
gall (v.), to wear away mechanically
gal-li-um (n.), a chemical element, Ga
gal-van-ic (adj.), related to direct current electricity
gal-va-nom-e-ter (n.) an instrument used to measure voltage
gam-ma (n.), a Greek letter, Γ and γ
gan-try (n.), a moveable tower used in servicing rockets
gar-net (n.) a mineral
gas-eous (adj.), relating to gas
gear (n.), equipment; also a toothed wheel in a machine
Gei-ger count-er (n.), an instrument for measuring radioactivity
gel (n.), a jellylike substance; (v.), to cause to become a gel
ge-lat-i-nous (adj.), jellylike
gen-er-al-ize (v.), to make an overall conclusion from available information
gen-er-ate (v.), to bring into being
gen-er-a-tor (n.), a machine that converts mechanical energy to electrical energy
ge-ner-ic (adj.), referring to a whole group
geo-de-sic (adj.), a kind of dome structure
ge-ol-o-gy (n.), the study of the history and structure of the earth
ge-om-e-try (n.), a branch of mathematics that deals with points, lines, surfaces, angles, and solids
germ (n.), the originating part or beginning of something
ger-ma-ni-um (n.), a chemical element, Ge
get-ter (n.), a material used to absorb gases in a vacuum tube
giga- (prefix), a billion

gilt (n.), a surface layer of gold
 or a material resembling gold
 gim-bal (n.), a mechanical support
 that allows a rod to incline in
 any direction
 gim-mick (n.), a clever device or
 feature of a device
 gird-er (n.), a horizontal structural
 member
 girth (n.), the distance around
 something
 gla-cial (adj.), resembling ice
 glanc-ing (adj.), not direct
 glaze (n.), a smooth, glassy coating;
 (v.), to coat with a smooth glas-
 sy layer
 glide (v.), to move smoothly
 glob-u-lar (adj.), spherical
 glob-ule (n.), a small, spherical
 object
 gloss (n.), a surface sheen
 glu-cose (n.), a sugar
 glyc-er-ine or glyc-er-ol (n.), a
 chemical compound
 gon (prefix or suffix), angle
 go-ni-om-e-ter (n.), an instrument
 for measuring angles
 grad (n.), a mathematical function
 gra-da-tion (n.), a step in a series
 grade (v.), to smooth off
 gra-di-ent (n.), the rate of change
 grad-u-at-ed (adj.), marked in units
 of measurement
 grain (n.), texture; also a metal
 crystal
 gram (n.), a unit of mass or weight
 (454 grams equals one pound)
 gran-ule (n.), a small particle
 graph (n.), a diagram showing the
 variations or a variable in com-
 parison with other variables;
 (v.), to draw a graphical diagram
 graph-ic (adj.), clear
 graph-ite (n.), a black, shiny
 mineral, a form of carbon
 grat-ing (n.), a metal screen or mesh
 used in optical instruments
 gravi-met-ric (adj.), referring to
 weight measurement
 grav-i-tate (v.), to move toward

grav-i-ta-tion (n.), the force that
 pulls one object toward another
 grav-i-ty (n.), the force that pulls
 objects toward the earth
 grid (n.), a mesh, network, or per-
 forated piece of metal; also the
 element that controls the flow
 of electrons in a vacuum tube
 gross (adj.), referring to the overall
 amount; (n.), the main body, mass
 ground (n.), the return lead touching
 the earth in an electrical circuit
 (often the chassis or plate on which
 the circuit is mounted); (adj.), basic
 guid-ance (n.), a control of a moving
 vehicle by automatic electronic
 means
 gy-rate (v.), to revolve around
 gy-ro (n.), abbreviation for
 gyroscope
 gy-ro-scope (n.), a device having
 complicated, spinning parts, used
 in stabilization and guidance of
 vehicles

H

hab-it (n.), the pattern or form of
 a crystal
 haf-ni-um (n.), a chemical element, Hf
 ha-la-tion (n.), a ring of light sur-
 rounding an image
 half-life (n.), the time it takes for
 half the amount of a radioactive
 substance to disintegrate
 ha-lide (n.), a chemical compound that
 contains either chlorine, fluorine,
 iodine, or bromine
 ha-lo (n.), a ring of light sur-
 rounding an object
 halo-gen (n.), a group of chemical
 elements including chlorine, iodine,
 bromine, and fluorine
 har-mon-ic (adj.), able to be described
 in terms of the functions sine and
 cosine; (n.), an overtone, or a tone
 whose frequency is a whole number of
 times faster than a basic frequency

heat-er (n.), the part of a vacuum tube that heats the cathode
 heli- or helio- (prefix), relating to the sun
 he-li-cal (adj.), see helix
 he-li-um (n.), a chemical element, He
 he-lix (n.), a spiral coil
 hemi-sphere (n.), half a sphere
 hep-tane (n.), an organic chemical compound
 hep-to- (prefix), seven
 her-met-ic (adj.), airtight
 hertz (n.), electrical frequency unit, one cycle per second; abb. Hz
 het-ero- (prefix), different
 het-ero-dox (adj.), unorthodox, contrary to standards
 het-ero-dyne (v.), to get a difference frequency from two frequencies of electrical waves
 hex- (prefix), six
 hex-a-gon (n.), a geometrical shape with six sides
 hex-ag-o-nal (adj.), see hexagon
 hex-al (n.), an organic chemical compound
 hex-ane (n.), an organic chemical compound
 hi-a-tus (n.), a break or pause
 hi-er-ar-chy (n.), a listing or ranking in order of importance
 his-to-gram (n.), a graph shown by an array of vertical bars of differing heights
 hole (n.), in electronics the absence of an electron
 ho-log-ra-phy (n.), a technique of handling light waves to create three-dimensional representations of objects
 hol-mi-um (n.), a chemical element, Ho
 home- or hom-eo- (prefix), the same
 ho-mog-e-neous (adj.), uniform; sometimes homogeneous
 ho-mog-e-nize (v.), to blend into a smooth mixture
 ho-mol-o-gous (adj.), having the same or a corresponding position or function
 hook-up (n.), an arrangement of components in an electrical circuit
 hop-per (n.), a box for holding particles of material
 ho-rol-o-gy (n.), the science of measuring time
 horse-pow-er (n.), a unit of power; abbreviated hp
 hub (n.), the central part of a wheel
 hue (n.), color
 hu-mid-i-fy (v.), to moisten a gas
 hu-mid-i-ty (n.), the amount of moisture in a gas
 hunt (n.), the back-and-forth movement of a mechanical or electrical mechanism as it attempts to settle at a particular value
 hy-brid (n.), an object composed of two or more different types
 hy-brid-ize (v.), to cause to produce hybrids
 hy-drate (n.), a chemical compound having "attached" water molecules
 hy-drau-lic (adj.), relating to water
 hy-drau-lics (n. singl. or pl.), the science that deals with liquids in motion
 hy-dra-zine (n.), a chemical compound
 hy-dride (n.), a chemical compound containing hydrogen
 hy-dro- (prefix), pertaining to water
 hy-dro-car-bon (n.), a chemical compound of hydrogen and carbon
 hy-dro-foil (n.), a winglike structure designed to move through water
 hy-dro-gen (n.), a chemical element, H
 hy-drol-y-sis (n.), a chemical reaction associated with dissolving in water
 hy-dro-lyze (v.), see hydrolysis
 hy-dro-phil-ic (adj.), having a strong attraction for water
 hy-dro-pho-bic (adj.), having a strong aversion for water
 hy-dro-stat-ic (adj.), relating to the pressure exerted by a quantity of water
 hy-drox-ide (n.), a chemical compound having a hydroxyl ion

hy-drox-yl (n.), the chemical radical
(OH)⁻
hy-gro- (prefix), relating to humidity
hy-grom-e-ter (n.), an instrument for
measuring humidity
hyper- (prefix), more, excessive
hy-per-bo-la (n.), a kind of curve
hy-per-bol-ic (adj.), see hyperbola
hypo- (prefix), meaning less, under
hy-pot-e-nuse (n.), the side of a tri-
angle opposite a right angle
hy-poth-e-sis (n.), an assumption
hy-poth-e-size (v.), to make a
hypothesis
hy-po-thet-i-cal (adj.), conditional,
conjectural

I

I beam (n.), a structural beam shaped
like an "I"
-ic (suffix), character of; see -ous
-ide (suffix), indicating a chemical
compound of two elements
idler (n.), a kind of wheel or gear
i-f (n.), abbreviation for inter-
mediate frequency
ig-ne-ous (adj.), referring to rock
that has solidified from magma (hot
liquid rock)
ig-nite (v.), to set on fire
ig-ni-tron (n.), a type of vacuum tube
-ile (suffix), relating to
il-lu-mi-nate (v.), to give light
il-lu-so-ry (adj.), deceptive
im-age (n.), representation of an
object
imag-i-nary (adj.), referring to an
unreal number (such as $\sqrt{-1}$)
im-mi-nent (adj.), about to happen
im-mis-ci-ble (adj.), unable to be
mixed together
im-mo-bile (adj.), unable to be moved
im-mo-bi-lize (v.), to prevent
movement
im-mune (adj.), not affected by
im-mu-ta-ble (adj.), unable to change

im-pact (n.), a forceful collision;
(v.), to collide suddenly
im-part (v.), to give
im-par-tial (adj.), unbiased
im-passe (n.), a deadlock, predica-
ment for which there is no easy
solution
im-ped-ance (n.), electrical resistance
im-pede (v.), to be in the way, to
hinder
im-ped-i-ment (n.), an obstacle
im-pel (v.), to push
im-pel-ler (n.), an engine part,
usually a blade or a fan, that
pushes a fluid forward
im-pend-ing (adj.), about to happen
very soon
im-per-me-able (adj.), not able to
be penetrated or diffused through
im-per-vi-ous (adj.), not able to be
penetrated or affected by external
environment
im-pe-tus (n.), a stimulus
im-pinge (v.), to strike or hit
im-plant (v.), to insert permanently
im-plau-si-ble (adj.), not likely to
be so, unbelievable
im-ple-ment (n.), a tool; (v.), to
make happen, to carry out
im-plic-it (adj.), understood from
previous information
im-plode (v.), to burst inward
im-plo-sion (n.), see implode
im-pon-der-a-ble (adj.), not able
to be weighed or measured
im-pose (v.), to place upon
im-po-tent (adj.), powerless
im-pound (v.), to confine
im-preg-na-ble (adj.), unable to be
overcome
im-preg-nant (n.), a substance that
permeates another material
im-preg-nate (v.), to cause a
material to be soaked with another
substance
im-press (v.), to dent, to make a
mark by pressure
im-pres-sion (n.), the mark made
by indenting or impressing
im-promp-tu (adj.), on the spur
of the moment

im-pro-vice (v.), to do something
 on the spur of the moment
 im-pulse (n.), a sudden force
 in-ac-ti-vate (v.), to render inactive
 in-an-i-mate (adj.), not alive
 in-au-di-ble (adj.), unable to be
 heard
 in-board (adv.), toward the center
 of a vehicle
 in-cal-cu-la-ble (adj.), unable to
 be calculated, extremely great;
 unpredictable
 in-can-des-cence (n.), light given
 off by a heated surface
 in-can-des-cent (adj.), see in-
 candescence
 in-ca-pac-i-tate (v.), to render
 incapable of acting
 in-cen-di-ary (adj.), relating to
 materials that easily burst into
 flame
 in-cep-tion (n.), the beginning
 in-ci-dence (n.), the rate of occur-
 ring; also the act of hitting upon
 a surface
 in-cip-i-ent (adj.), beginning to ap-
 pear or to happen
 in-cise (v.), to cut into
 in-cli-na-tion (n.), a dipping,
 bending, or deviation from the ver-
 tical or horizontal
 in-clined (adj.), having inclination;
 leaning
 in-co-her-ent (adj.), without pattern,
 scattered
 in-com-men-su-ra-ble (adj.), lacking
 a common basis of measurement
 in-com-men-su-rate (adj.). see
 incommensurable
 in-com-pat-i-ble (adj.) two or more
 things that cannot work together
 in-con-tro-vert-ible (adj.), without
 doubt
 in-cor-po-rate (v.), to include and
 blend in thoroughly
 in-cre-ment (n.), a small increase
 or decrease
 in-crus-ta-tion (n.), a hard, crusty
 top layer

in-cu-bate (v.), to maintain condi-
 tions favorable to development
 in-cur (v.), to become subject to
 some condition
 in-de-fin-able (adj.), incapable of
 being exactly described
 in-def-i-nite (adj.), not precise
 in-dent (v.), to form a depression by
 pressing
 in-den-ta-tion (n.), a depression
 on a surface, a dent
 in-de-pen-dent (adj.), occurring on
 its own, not affected by other
 factors
 in-de-ter-mi-nate (adj.), vague
 in-dex (n.), a mark or pointer on
 a measuring device; also a number
 having a special significance;
 (v.), to move position to effect a
 given sequence or operation
 in-di-cate (v.), to point out; also
 to suggest the likelihood of an
 occurrence
 in-di-ca-tor (n.), something that
 shows an effect; also a pointer
 in a measuring device
 in-di-um (n.), a chemical element, In
 in-di-vis-i-ble (adj.), not able to
 be separated into smaller pieces
 in-duce (v.), to cause induction
 in-duc-tance (n.), a quality of an
 electrical circuit that causes
 electrical waves to lag
 in-duc-tion (n.), the passage of
 electricity from a charged object
 to another object
 in-duc-tive (adj.), see induction
 in-duc-tor (n.), the electrical com-
 ponent (such as a coil) that
 passes on electricity
 in-ef-fi-cient (adj.), not produc-
 tive, wasteful
 in-el-as-tic (adj.), having no
 elasticity
 in-ert (adj.), incapable of chemical
 reaction
 in-er-tia (n.), the tendency of a
 moving object to keep moving in the
 same direction, and of a stationary
 object to remain unmoving

in-fal-li-ble (adj.), incapable of making a mistake
 in-fil-trate (v.), to penetrate into something little by little
 in-fi-nite (adj.), without limit, having no end
 in-fin-i-tes-i-mal (adj.) extremely tiny
 in-flex-i-ble (adj.), rigid
 in-flux (n.), a flowing in
 infra- (prefix), below
 in-fra-red (n.), light waves invisible to the human eye; also heat waves
 in-fra-son-ic (adj.), sound waves too low in frequency to be heard by the human ear
 in-fuse (v.), to pour something into something else
 in-ge-nu-ity (n.), inventiveness
 in-got (n.), a mass of refined metal before its final processing
 in-her-ent (adv.), referring to a basic character
 in-hib-it (v.), to hold back
 in-hib-i-tor (n.), see inhibit
 ini-tial (adj.), referring to the first
 in-ject (v.), to push into or force in
 in-lay (v.), to insert one metal into the surface of another; (n.), the in-laid metal
 in-no-vate (v.), to introduce something new
 in-op-er-a-tive (adj.), out of order, not functioning
 in-or-gan-ic (adj.), relating to chemicals other than carbon; also materials that have never lived, inanimate
 in si-tu (adj. or adv.), in place (Latin)
 in-sol-u-ble (adj.), unable to be dissolved
 in-su-la-tor (n.), a material incapable of conducting electricity or heat
 in-te-ger (n.), a whole number without decimals or fractions
 in-te-grate (v.), to perform an operation in calculus; also to incorporate
 in-te-gra-tor (adj.), a kind of electronic unit

in-ten-si-ty (n.), the strength or amount
 inter- (prefix), between
 in-ter-act (v.), to act on each other
 in-ter-ac-tion (n.), see interact
 in-ter-cept (v.), to interrupt the progress of
 in-ter-de-pen-dent (adj.), depending on each other
 in-ter-elec-trode (adj.), between electrodes
 in-ter-face (n.), the plane separating two regions
 in-ter-fer-ence (n.), the effect of light waves or electrical waves on each other
 in-ter-fer-ence fringe (n.), a dark line caused by interference
 in-ter-fer-om-e-ter (n.), an instrument that measures light interference
 in-ter-im (n.), the time between
 in-ter-ject (v.), to throw into the midst of
 in-ter-lin-ear (adj.), placed between lines
 in-ter-mit-tent (adj.), separated at intervals
 in-ter-po-late (v.), to insert
 in-ter-re-late (v.), to show the relationship between different things
 in-ter-sect (v.), to meet and cross (said of lines)
 in-ter-sec-tion (n.), see intersect
 in-ter-sperse (v.), to place things into a system at intervals
 in-ter-stice (n.), the space between things
 in-ter-sti-tial (adj.), relating to the space between
 in-tra- (prefix), within; during
 in-tri-cate (adj.), complex
 in-trin-sic (adj.), basic, fundamental, essential
 intro- (prefix), within
 in-tro-duce (v.), to bring in
 in vac-uo (adv.), in a vacuum (Latin)
 in-val-id (adj.), without basis or foundation

in-val-i-date (v.), to destroy or nullify
 in-vari-able (adj.), constant
 in-ven-to-ry (n.), a list of the items in a system
 in-verse (adj.), opposite or backwards
 in-ver-sion (n.), a reversal of order
 in-vert (v.), to turn upside-down
 in-vert-er (n.), a kind of electronic circuit
 in-vest-ment (n.), a kind of casting done in foundries
 in-vo-lute (adj.), relating to spiral-like curves
 io-dine (n.), a chemical element, I
 ion (n.), an atom or chemical radical having an electrical charge
 ion-ic (adj.), see ion
 ion-ize (v.), see ion
 ion-o-lu-mi-nes-cence (n.), a light glow as a result of ion activity
 iono-sphere (n.), a layer of the atmosphere starting about 25 miles up which contains charge particles
 io-ta (n.), a Greek letter; also a very small amount
 ip-so fac-to (adv.), the nature of the situation
 ir-i-des-cent (adj.), having varying colors
 irid-i-um (n.), a chemical element, Ir
 iris (n.), a diaphragm having a circular hole
 iron (n.), a chemical element, Fe; the primary constituent of steel
 ir-ra-di-ate (v.), to cast rays on
 ir-ri-gate (v.), to wash with flowing water
 is- (prefix), meaning the same equal
 iso- (prefix), meaning the same, equal
 iso-bar (n.), a line on a weather map connecting areas of equal air pressure
 iso-met-ric (adj.), in mechanical drawing, using the three perpendicular axes
 iso-mor-phic (adj.), having the same shape

isos-ce-les (adj.), referring to a triangle having two equal sides
 iso-ther-mal (adj.), having the same temperature
 iso-tope (n.), an atom in which the number of neutrons varies from those of other atoms of the same element
 is-sue (n.), result, outcome
 -ite (suffix), designating a chemical radical having less oxygen than an -ate radical
 it-er-ate (v.), to repeat ("reiterate" means to repeat again)

J

jer-ry-built (adj.), poorly or cheaply made
 jet (n.), a forceful stream of gas or liquid
 jig (n.), a structure for holding in position pieces that are being worked on
 joint (n.), the place at which two parts are joined
 joist (n.), a structural member
 joule (n.), a unit of energy
 junc-tion (n.), the region between two types of conductors in a semiconductor device

K

ka-o-lin (n.), a kind of clay
 kap-pa (n.), a Greek letter, κ
 keel (n.), the center beam at the bottom of a boat
 kerf (n.), the width of a cut made by a saw
 ker-nel (n.), the central or basic part of something
 ke-tene (n.), an organic chemical compound
 ke-tone (n.), an organic chemical compound
 ki-lo (prefix), a thousand

kilo-cal-o-rie (n.), one thousand calories
 kilo-cy-cle (n.), one thousand cycles
 kilo-gram (n.), one thousand grams
 kilo-mega- (prefix), one billion
 kilo-me-ter (n.), one thousand meters
 kilo-volt (n.), one thousand volts
 kilo-watt-hour (n.), a thousand watt-hours; kwhr
 ki-ne-mat-ics (n.), the science of the motions of objects
 kin-e-scope (n.), a cathode-ray tube, the picture tube in a television set
 ki-net-ic (adj.), the science of the effect of forces on moving objects
 kit (n.), a set of parts to be assembled to form a finished object
 kly-stron (n.), a type of microwave vacuum tube
 knurl (n.), a series of projections on the surface of a piece of metal that make the part easy to grasp; (v.), to make such projections
 kryp-ton (n.), a chemical element, Kr
 kva (n.), kilovolt-ampere
 kwhr (n.), kilowatt-hour

L

lab-y-rinth (n.), a structure consisting of many complex passages or tunnels or both
 lab-y-rin-thine (adj.), see labyrinth
 lamb-da (n.), a Greek letter, Λ , λ
 lam-bert (n.), a unit of the brightness of light
 la-mel-la (pl. lamellae) (n.), a layer
 la-mel-lar (adj.), see lamella
 lam-i-na (pl. laminae) (n.), the same as lamella, a layer
 lam-i-nar (adj.), see lamina
 lam-i-nate (v.), to press layers together
 lan-tha-num (n.), a chemical element, La
 lap (v.), to grind gently, to smooth and polish; (n.), the instrument used in lapping
 lap joint (n.), a joint made by overlapping the edges of two pieces
 large sig-nal (adj.), a condition of electronic circuit operation
 la-ser (n.), a device that generates a narrow, extremely intense beam of light
 la-tent (adj.), quiescent, dormant, inactive
 lat-er-al (adj.), to one side
 la-tex (n.), an emulsion of rubber
 lathe (n.), a machine used to cut and shape parts
 lat-tice (n.), a regular arrangement of points or positions; crystal structure
 law-renc-i-um (n.), a chemical element, Lw
 leach (v.), to dissolve material by percolating liquid through it
 lead (n.), a heavy metallic element, Pb; (v.), to move ahead, the opposite of lag
 lead-ing edge (n.), the front edge of an electromagnetic wave
 lens (n.), a piece of glass shaped to refract and focus light
 lever (n.), a bar used to move or lift objects
 lev-i-tate (v.), to cause to rise or float
 lift (n.), the amount of upward force on an aircraft
 lig-nite (n.), a type of coal
 lim-it-er (n.), a kind of electronic circuit
 lin-ear (adj.), arranged in a series or sequence; also pertaining to a mathematical function in which one element is directly dependent on another
 li-qui-dus (n.), the temperature range at which a component in a liquid mixture starts to solidify
 list (v.), to lean to one side

li-ter (n.), a measure of volume in the metric system, equals about a quart

li-tharge (n.), a chemical compound of lead, lead monoxide

lith-ic (adj.), relating to stone

lith-i-um (n.), a light metallic element, Li

li-thog-ra-phy (n.), a printing process

lit-mus (n.), a material that indicates if a solution is acid or alkaline

load (n.), a resistor or resistive component that carries electrical current

lock-ing (n.), a kind of electronic circuit

lo-co-mo-tion (n.), the act of moving

lo-cus (n.), a place set by mathematical considerations

lode-stone (n.), a magnetic mineral, magnetite

log (n.), abbreviation for logarithm

log-a-rithm (n.), the exponent that tells the power to which a number is to be raised in order to equal another number

lo-gis-tic (adj.), relating to a kind of mathematical reasoning

loop (n.), a circular path

lo-ran (n.), a kind of navigation using electronic systems

loss (n.), electrical power that is lost from a system

loud-speak-er (n.), the electronic transducer that converts electric current to sound

lu-bri-cate (v.), to make slippery by applying a liquid

Lu-cite (n.), a kind of plastic

lug (n.), a projection to which wires can be fastened

lu-men (n.), a unit of light intensity

lu-mi-nes-cence (n.), a glow of light due to factors other than heat

lu-mi-nous (adj.), glowing, shining

lu-te-tium (n.), a chemical element, Lu

lye (n.), a strong alkaline chemical solution

Mach number (n.), a number indicating how much faster than the speed of sound an object is moving

ma-chine (v.), to cut and shape using a rotary automatic tool; (n.), a device which advantageously uses force

mac-ro- (prefix), large

mac-ro-scop-ic (adj.), large enough to be seen by the naked eye

mag-ma (n.), hot, liquid rock

mag-nes-ia (n.), a chemical compound, magnesium oxide (MgO)

mag-ne-sium (n.), a light metallic element, Mg

mag-net (n.), a material that can attract certain materials toward itself

mag-ne-tite (n.), a magnetic mineral of iron

mag-ne-to (n.), a generator of electrical current

mag-ne-to-hy-dro-dy-nam-ic (adj.), relating to the effect of magnetism on fluids; MHD

mag-ne-tom-e-ter (n.), an instrument for measuring magnetic intensity

mag-ne-to-mo-tive (adj.), relates to the mechanical force exerted by a magnetic field

mag-ne-to-stric-tion (n.), a change in the dimensions of a body as a result of exposure to a magnetic field

mag-ne-tron (n.), a microwave vacuum tube that operates in a magnetic field

mag-ni-fy (v.), to increase in size, to enlarge

mal- (prefix), bad

mal-a-chite (n.), a mineral of copper

mal-func-tion (v.), to fail to work effectively; (n.), the failure to operate

mal-lea-ble (adj.), bendable

man-drel (n.), a metal shaft that serves as a core around which other metal is shaped

man-ga-nese (n.), a chemical element, Mn

man-i-fest (adj.), easily apparent
 man-i-fes-ta-tion (n.), an action or
 circumstance that demonstrates a
 principle
 man-i-fold (n.), a pipe to which many
 smaller pipes are attached
 ma-nip-u-late (v.), to manage or
 control
 ma-nom-e-ter (n.), an instrument that
 measures pressure
 man-u-al (n.), a handbook; (adj.),
 able to be worked by hand
 mar-ble-ize (v.), to put in vein-
 like markings
 mar-gin (n.), a spare amount
 mar-gin-al (adj.), just barely
 achieving what is required
 mar-tens-ite (n.), a constituent of
 steel
 mas-er (n.), a device that gives
 off a strong, narrow beam of micro-
 wave electromagnetic radiation;
 compare with laser
 mass (n.), weight; also the greater
 part
 mass spec-tro-graph (n.), an instru-
 ment that separates and measures
 isotopes of a chemical element
 ma-trix (n.), an array of numbers;
 also a set pattern; also the
 parent structure in which another
 component is embedded
 matte (n.), a mixture of molten
 minerals
 max-i-mal (adj.), referring to the
 most
 max-i-mize (n.), to increase to the
 maximum
 max-i-mum (n.), the greatest amount
 attainable
 max-well (n.), an electromagnetic
 unit
 maze (n.), a network of channels
 and passages
 mea-ger (adj.), scanty
 mean (n.), an intermediate in a
 range of values; similar to average
 mean free path (n.), the average
 distance a particle can travel
 mea-sure (n.), a standard of
 comparison

mech-a-nism (n.), a piece of machine-
 ry; also the means whereby something
 is done
 mech-a-nize (v.), to make automatic
 me-dia (n.), plural of medium
 me-di-an (n.), the number or position
 midway in a range
 me-di-um (n.), the environment in
 which something is situated
 mega- (prefix), million
 mega-cy-cle (n.), a million cycles
 mega-ton (n.), a million tons
 mega-volt (n.), a million volts
 mega-watt (n.), a million watts
 meg-ohm (n.), a million ohms
 mel-a-mine (n.), a kind of plastic
 melting point (n.), see freezing point
 mem-ber (n.), a part of something
 mem-brane (n.), a thin, flexible sheet
 mem-o-ry (n.), the part of a computer
 that stores information; also the
 ability of a computer to store
 information
 men-de-le-vi-um (n.), a chemical
 element, Md
 me-nis-cus (n.), the curved surface
 of a liquid that is contained in a
 column
 men-su-ra-ble (adj.), able to be
 measured
 mer-cap-tan (n.), a group of organic
 chemical compounds
 mer-cu-ry (n.), a chemical element,
 Hg
 merge (v.), to blend into
 me-rid-i-an (n.), a circle drawn
 around a sphere, especially
 through the poles of the earth
 me-sa (n.), an upward slope that ends
 with a flat table
 mesh (n.), a network; (v.), to cause
 to engage (with reference to gears)
 meso- (prefix), middle
 me-son (n.), an atomic particle
 meta- (prefix), after, later, beyond
 met-al-lo-graph (n.), an apparatus
 for photographing microscopic metal
 crystals
 met-al-loid (n.), a material that has
 some, but not all, the properties
 of a metal

met-al-lur-gist (n.), one who practices metallurgy
 met-al-lur-gy (n.), the science and technology of metals
 meta-sta-ble (adj.), only slightly stable
 me-te-or-ite (n.), a small object from space that reaches the earth
 me-te-o-rol-o-gy (n.), the study of weather
 me-ter (n.), a device that measures amounts; also a measure of length, a little more than a yard; (v.), to measure out
 meth-ane (n.), a gaseous organic compound
 meth-a-nol (n.), an organic compound, a kind of alcohol
 me-thod-i-cal (adj.), systematic
 meth-od-ol-o-gy (n.), a set of rules by which something is to be done
 meth-yl (n.), an organic radical
 me-tic-u-lous (adj.), careful
 met-ric (adj.), referring to the system of measurement that is based upon the centimeter, gram, second (cgs)
 mho (n.), the unit of electrical conductivity, the reciprocal of ohm
 mi-ca (n.), a mineral that is made up of lamellae
 mi-cel-lar (adj.), see micelle
 mi-celle (n.), a unit of structure of certain organic compounds
 micro- (prefix), very small; also one millionth
 mi-cro-gram (n.), one millionth of a gram
 mi-cr-og-ra-phy (n.), microscopic examination
 mi-crom-e-ter (n.), a tool for measuring small distances
 mi-cron (n.), a unit of length, a millionth of a meter
 mi-cro-pho-to-graph (n.), a photograph taken through a microscope
 mi-cro-ra-dio-graph (n.), a microphotograph made with X-rays

micro-scop-ic (adj.), very tiny
 micros-co-py (n.), the technique of using the microscope
 mi-cro-struc-ture (n.), the microscopic structure of something
 mi-cro-wave (n.), adj.), a short, high-frequency electromagnetic wave
 mi-cro-wave plumb-ing (n.), the wave guide used in conducting microwave current
 mi-gra-tion (n.), movement from one place to another
 mil (n.), a thousandth of an inch
 mi-lieu (n.), environment
 mill (v.), to machine a piece of metal by cutting with a rotary tool
 Mil-ler in-dex (n.), a series of numbers used in identifying crystal faces
 milli- (prefix), a thousandth
 mil-li-am-pere (n.), a thousandth of an ampere
 mil-li-gram (n.), one thousandth of a gram
 mil-li-li-ter (n.), one thousandth of a liter, a cubic centimeter
 mil-li-me-ter (n.), one thousandth of a meter
 mil-li-volt (n.), one thousandth of a volt
 min-er-al (n.), a naturally occurring chemical compound, usually crystalline
 min-er-al-o-gy (n.), the study of minerals
 mini- (prefix), tiny
 min-ia-tur-iza-tion (n.), the act of making a very small, operable object
 min-ia-tur-ize (v.), see miniaturization
 min-i-mize (v.), to reduce to a minimum
 min-i-mum (n.), the smallest amount possible
 minor (adj.), lesser
 min-term (n.), the smallest number (in computer programming)
 mi-nus (prep.), diminished by; (adj.), negative, in algebra; (n.), a deficiency

mi-nus-cule or min-is-cule (adj.), tiny
 mi-nute (adj.), tiny
 min-ute (n.), one sixtieth of an hour;
 one sixtieth of a degree of arc
 mi-nu-tiae (n.), tiny details
 mi-rage (n.), a type of optical
 illusion
 mis-cal-cu-late (v.), to make an
 error in calculation
 mis-ci-ble (adj.), able to be mixed
 together
 mis-in-ter-pret (v.), to understand
 or explain incorrectly
 mis-no-mer (n.), a descriptive name,
 wrongly applied
 mis-sile (n.), something thrown, an
 unmanned flying weapon
 mis-sile-ry (n.), the study of the
 design, construction, and use of
 missiles
 mi-ter or mi-tre (n.), a corner
 formed by joining two pieces that
 have been cut at an angle; (v.),
 to make a miter joint
 mit-i-gate (v.), to make less intense
 mix-er (n.), a kind of electronic
 circuit
 mne-mon-ic (n., adj.), a reference
 code used in programming
 mo-bile (adj.), moveable
 mo-bil-i-ty (n.), the ease with
 which electricity moves
 mock-up (n.), a full-sized model
 mode (n.), a particular arrange-
 ment or pattern
 mod-el (n.), a constructed repre-
 sentation of an object; or a
 theoretical description (v.),
 to shape
 mod-er-a-tor (n.), a substance that
 slows down a chemical or physical
 reaction
 mod-u-lar (adj.), see module
 mod-u-late (v.), to vary a property
 of a carrier signal, particularly
 in radio and electricity
 mod-u-la-tor (n.), a kind of elec-
 tronic circuit
 mod-ule (n.), a section of parts
 of a large system

mod-u-lus (n.), a number or coeffi-
 cient used to describe a condition
 mo-dus ope-ran-di (n.), the manner
 in which something works
 mod-us vi-ven-di (n.), a feasible
 way of operating
 Moh's scale (n.), a scale used to
 measure hardness of minerals
 mol (n.), see mole
 mol-al (adj.), relating to a solu-
 tion containing one mole of a
 chemical
 mol-ar (adj.), relating to one mole
 of a chemical compound
 mold (v.), to shape into a given
 form; to cast; (n.), the form into
 which a liquid is poured in order
 that it take on the shape of that
 form after it solidifies
 mold-ing (n.), a border or frame
 mole or mol (n.), the weight of a
 chemical expressed in grams numeri-
 cally equal to the weight, in atomic
 units, of its molecules
 mo-lec-u-lar (adj.), relating to
 molecules
 mol-e-cule (n.), the smallest particle
 of a chemical compound
 mol-ten (adj.), melted, fused
 mo-lyb-de-num (n.), a heavy, metallic
 element, Mo
 mo-ment (n.), a measure of the ten-
 dency of something to rotate around
 an axis
 mon-, mono- (prefix), one
 mon-atom-ic (adj.), having only one
 atom
 mon-au-ral (adj.), receiving sound
 through a single transmitter
 Mo-nel (n.), an alloy of copper and
 nickel
 mon-i-tor (n.), an instrument that
 watches and checks a process; (v.),
 to watch and check a process
 mo-no-clin-ic (n.), a crystal system
 mo-no-lith-ic (adj.), having a massive
 structure consisting of a single
 stone
 mon-o-mer (n.), form of organic chem-
 ical compound

mon-ox-ide (n.), a chemical compound
 having one oxygen atom
 moot (adj.), not settled, open to
 discussion
 mor-dant (n.), a substance that ren-
 ders a dye permanent
 morph- (prefix or suffix), relating
 to form or shape
 morphol-o-gy (n.), the study of form
 and structure
 mo-sa-ic (n.), a structure made up
 of small pieces
 mould (n.), see mold
 mount (v.), to set up; raise
 mu (n.), a Greek letter, also a qual-
 ity of a vacuum tube
 mul-lion (n.), part of a door or a
 window
 multi- (prefix), many
 mul-ti-far-i-ous (adj.), having great
 variety
 mul-ti-form (adj.), having many
 forms
 mul-ti-lat-er-al (adj.), having
 many sides
 mul-ti-plex (adj.), relating to the
 sending of many messages at once
 on one electrical channel
 mul-ti-pli-cand (n.), a number that
 is multiplied by another
 mul-ti-PLIC-i-ty (n.), a great num-
 ber or variety
 mul-ti-PLI-er (n.), a type of circuit
 mul-ti-vi-bra-tor (n.), a type of
 circuit
 mu-ri-at-ic acid (n.), hydrochloric
 acid
 mu-ta-ble (adj.), changeable
 mu-tant (n.), the product of a
 changing process
 mu-tate (v.), to cause to change
 mute (v.), to soften the loudness of
 a sound
 myr-i-ad (n.), a very great number

na-dir (n.), the lowest possible
 point
 nano- (prefix), one billionth, 10^{-9}
 naph-tha (n.), an organic compound
 naph-tha-lene (n.), an organic
 compound
 na-scent (adj.), newly existing
 ne- or neo- (prefix), new
 neb-u-la (n.), a cloud
 neb-u-lar (adj.), pertaining to
 nebula
 neb-u-lous (adj.), pertaining to
 nebula
 neb-u-lous (adj.), vague, hazy
 ne-gate (v.), to render ineffective,
 to deny
 neg-a-tive (adj.), less than zero;
 unfavorable
 ne-o-dym-i-um (n.), a chemical
 element, Nd
 ne-on (n.), a chemical element, Ne
 ne-o-prene (n.), a synthetic rubber
 nep-tu-ni-um (n.), a chemical
 element, Np
 network (n.), a system of inter-
 connected parts
 neu-ron (n.), a nerve cell
 neu-tral (adj.), neither acid nor
 alkaline
 neu-tral-ize (v.), to counteract, to
 nullify
 neu-tron (n.), a particle in the
 atomic nucleus that has no elec-
 trical charge
 neu-tron-o-lu-mi-nes-cence (n.), a
 glow as a result of impact by
 neutrons
 nib (n.), a small projection
 nick-el (n.), a chemical element, Ni
 Nic-ol (adj.), a kind of prism used
 in optics
 nil (n.), nothing
 ni-o-bi-um (n.), a chemical element,
 Nb (sometimes called columbium, Cb)
 ni-tro-gen (n.), a gaseous chemical
 element, N; the major constituent
 of the air

no-bel-i-um (n.), a chemical element,
 No
 node (n.), a position that is free
 from vibrations on the vibrating
 structure
 nod-u-lar (adj.), see nodule
 nod-ule (n.), a small lump
 noise (n.), meaningless sound that
 has no pattern or regularity
 no-men-cla-ture (n.), the system of
 naming elements
 nom-i-nal (adj.), in name only
 no-mo-graph (n.), see nomograph
 no-mo-graph (n.), a chart that allows
 one to find the value of a third
 variable when the values of two
 other variables are known
 non- (prefix), no
 non-fer-rous (adj.), an alloy or com-
 pound that does not contain iron
 nor-mal-ize (v.), to reduce to a
 common basis
 no-ta-tion (n.), the designation of
 parts of a system, especially by
 use of symbols
 nox-ious (adj.), harmful, unpleasant
 noz-zle (n.), a small spout from
 which gas or liquid may flow
 nth (adj.), the ultimate
 n-type (n.), a type of semiconductor
 material, doped with n-material;
 also N-type
 nu (n.), a Greek letter, ν
 nu-ance (n.), a subtle variation
 or gradation
 nub (n.), the point, the gist
 nu-cle-ar (adj.), relating to the
 nucleus
 nu-cle-ate (v.), to provide a
 nucleus or seed for something to
 grow on
 nu-cle-on-ics (n.), the study of
 the properties of the atomic
 nucleus
 nu-cle-us (n.), the center of the
 atom containing the protons and
 the neutrons
 nu-clide (n.), a kind of atom
 nug-get (n.), a solid lump
 null (n.), zero; the place on a
 meter that indicates zero

nul-li-fy (v.), to make useless
 and ineffective
 nul-li-ty (n.), something that is
 null
 nu-mer-a-tion (n.), the act of
 designating by number
 nu-mer-a-tor (n.), the bottom
 number in a fraction
 nur-ture (v.), to give nourishment

0

ob- (prefix), against
 ob-jec-tive (n.), the lens system
 at the end of a microscope near-
 est what is being looked at
 ob-late (adj.), flattened
 oblique (adj.), tilted
 oblit-er-ate (v.), to destroy all
 trace
 ob-scure (adj.), not clear, dark
 ob-ser-va-tion (n.), the making
 and recording of an exact
 measurement
 ob-so-les-cence (n.), becoming out
 of date
 ob-so-lete (adj.), out of date, no
 longer used
 ob-tuse an-gle (n.), an angle be-
 tween 90° and 180°
 oc-clude (v.), to obstruct; also
 to dissolve a gas into a material
 oc-ta- or octo- (prefix), eight
 oc-ta-gon (n.), an eight-sided
 figure
 oc-ta-he-dral (adj.), relating to an
 eight-sided solid figure
 oc-tane (n.), a kind of chemical
 compound
 oc-u-lar (adj.), relating to what
 is seen; (n.), the eyepiece of a
 microscope or telescope
 -ode (suffix), a path, usually
 electronic
 ohm (n.), the unit of electrical
 resistance
 ohm-ic (adj.), see ohm
 ohm-me-ter (n.), an instrument for
 measuring ohms

-oid (suffix), resembling
 ole-ag-i-nous (adj.), oily
 oleic ac-id (n.), a chemical compound
 ome-ga (n.), a Greek letter, Ω , ω
 om-i-cron (n.), a Greek letter, $\circ$
 opac-i-ty (n.), the property of
 obstructing the passage of light
 opaque (adj.), not transparent
 op-er-a-tion (n.), a mathematical
 process
 op-tic (adj.), relating to vision
 optics (n.), the science of light
 or-der (n.), a pattern; also a
 ranking
 or-dered (adj.), in a particular
 pattern
 or-di-nal (adj.), numbered in sequence
 or-di-nate (n.), the vertical axis
 of a graph; also one of the coordi-
 nates of a point on a graph
 or-gan-ic (adj.), relating to the
 chemistry of carbon; also relating
 to living things
 or-ga-nism (n.), a complex structure
 consisting of many parts
 ori-ent (v.), to set in a particular
 direction or position
 ori-en-ta-tion (n.), the process of
 orienting
 or-i-gin (n.), the beginning; also
 an intersection of some primary
 lines on a graph
 orth-, ortho- (prefix), straight
 or-thi-con (n.), a camera used in
 television
 or-tho-graph-ic (adj.), a type of
 projection used in drafting
 or-tho-phos-pho-ric acid (n.), a
 chemical compound
 or-tho-rhom-bic (n.), a form of
 crystal
 os-ci-late (v.), to swing back and
 forth repeatedly
 os-cil-la-tor (n.), a kind of elec-
 tronic circuit
 os-cil-lo-scope (n.), an electrical
 instrument in which wave forms
 are made visible on a screen
 os-mi-um (n.), a heavy metallic
 element, Os

os-mo-sis (n.), diffusion of liquid
 through a membrane
 -ous (suffix), designating a chemi-
 cal radical with a lower valence
 than one ending in -ic
 out-crop (n.), the part of a rock
 formation that emerges at the
 ground
 out-gas (v.), to remove gas from
 materials
 out-growth (n.), the result of a
 process
 out-put (n.), what is produced from
 a system
 over-lay (n.), a layer of something
 on top of a structure
 over-tone (n.), a frequency that is
 multiple of a fundamental
 frequency
 ovoid (adj.), shaped like an egg
 ox-i-da-tion (n.), the process of
 reacting with oxygen
 ox-ide (n.), a chemical compound
 containing oxygen
 oxy- (prefix), containing oxygen
 ox-y-gen (n.), a chemical element, O
 ox-y-lu-mi-nes-cence (n.), a glow pro-
 duced by oxidation
 ozone (n.), a gas whose molecules
 consist of three atoms of oxygen, O₃

P

pal-la-di-um (n.), a precious met-
 allic chemical element, Pd
 pal-mit-ic acid (n.), an organic
 acid
 pal-pa-ble (adj.), able to be
 touched, tangible, easily under-
 stood
 pan (v.), to rotate a camera so as
 to keep a moving object in view
 pan-to-graph (n.), a tool used in
 copying a pattern, usually at a
 different size
 par (n.), an amount taken as standard
 para- (prefix), beside; similar
 pa-rab-o-la (n.), a bowl-shaped curve

par-a-bol-ic (adj.), see parabola
 pa-rab-o-loid (n.), a parabolic surface
 par-a-dox (n.), a statement that seems contradictory but may be true
 par-a-dox-i-cal (adj.), see paradox
 par-af-fin (n.), a waxy material
 par-a-gon (n.), a model of excellence
 par-al-lax (n.), the apparent difference in position of an object as it is seen from two different angles
 par-al-lel (adj.), lines of surfaces which are always the same distance apart; also comparable, analogous; also, an electronic circuit
 par-al-lel-ism (n.), the state of being parallel
 par-al-lel-o-gram (n.), a four-sided figure in which opposite sides are parallel; also a solid with parallel sides
 par-al-lel-o-piped (n.), a prism with bases that are parallelograms
 pa-ra-mag-net-ic (adj.), slightly magnetic
 pa-ram-e-ter (n.), a characteristic quality of something
 para-met-ric am-pli-fi-er (n.), an electronic circuit using solid-state devices
 paramp (n.), abbreviation for parametric amplifier
 par-a-sit-ic (adj.), relating to something that is dependent on something else
 pare (v.), to shave off or trim
 par-i-ty (n.), the condition of being equivalent
 pa-ro-chi-al (adj.), narrow
 par-ti-cle (n.), a small object; also, a substance of atomic size or smaller
 par-tic-u-late (adj.), see particle
 patch (n.), a particular area within a larger area
 pa-ti-na (n.), a surface film acquired over a period of time
 pat-tern (n.), a design; (v.), to imitate

pau-ci-ty (n.), a scarceness, a dearth
 peak (n.), a maximum, a high point; (v.), to reach a maximum
 pearl-ite (n.), a constituent of steel
 peen (v.), to flatten by hammering
 peg (v.), to fix or hold at a particular level
 pel-let (n.), a small ball
 pel-lu-cid (n.), clear, transparent
 pen-du-lum (n.), an object placed at the bottom of a line and swinging back and forth
 pen-e-tra-ble (adj.), able to be pierced
 pen-e-trate (v.), to pierce to pass through
 pent (adj.), confined
 pent- (prefix), five
 pen-ta-gon (n.), a five-sided figure
 pen-ta-he-dron (n.), a five-sided solid
 pen-tane (n.), an organic chemical compound, a hydrocarbon
 pen-tode (n.), a five-element vacuum tube or semiconductor device
 pent-ox-ide (n.), an oxide with five oxygen atoms
 pen-tyl (n.), an organic chemical radical
 pe-num-bra (n.), a partial shadow
 per- (prefix), through; also containing the largest amount
 per an-num (adv.), yearly
 per-bo-rate (n.), a chemical compound of boron
 per cap-i-ta (adv.), for each person in a population
 per-ceive (v.), to understand
 per cent (n.), on the basis of one hundred
 per-cen-tile (n.), within a one per cent range
 per-cep-ti-ble (n.), detectable
 per-cep-tu-al (adj.), able to be observed with the senses
 per-chlo-rate (n.), a chemical compound of chlorine

per-co-late (v.), the trickling of a liquid through a porous mass of solid material
 per-cus-sion (n.), the act of striking sharply
 per-fect (v.), to bring to a final, desirable form
 per-fo-rate (v.), to make a hole
 per-func-to-ry (adj.), routine
 peri- (prefix), enclosing; near
 per-im-e-ter (n.), the distance around a figure
 pe-ri-od (n.), the time required for one cycle in a repeating series
 pe-ri-od-ic (adj.), recurring at regular intervals
 pe-ri-od-ic-i-ty (n.), the degree or the state of recurring regularly
 pe-ri-ph-ery (n.), perimeter, outer boundary
 peri-scope (n.), an instrument for looking around corners or over obstacles
 per-ish-able (adj.), spoilable
 per-man-ga-nate (n.), a chemical radical of manganese
 per-me-abil-i-ty (n.), able to be diffused through; also the amount of magnetic effect made by mag. matl.
 per-me-ance (n.), a unit describing magnetic qualities
 per-mit-tiv-i-ty (n.), a unit describing the electrical quality of a dielectric material
 per-mu-ta-tion (n.), a change
 per-mute (v.), to change an arrangement
 per-ox-ide (n.), a chemical compound of oxygen
 per-pen-dic-u-lar (adj.), at right angles
 per-spec-tive (n.), the rendering of a drawing so that the object shown appears on paper to be solid; also a view from a particular position
 per-ti-nent (adj.), relevant
 per-turb (v.), to cause a deviation
 per-turb-a-tion (n.), a disturbance of a regular situation
 per-vade (v.), to penetrate and diffuse through something

per-vi-ous (adj.), permeable
 pes-tle (n.), an implement used for crushing in a mortar
 petr- (prefix), stone
 pet-ri-fy (v.), to convert into a stony material
 pet-ro-chem-i-cal (adj.), relating to chemicals in oil
 pe-trog-ra-phy (n.), the study and classification of rocks
 pet-rol-o-gy (n.), the study of the origin and composition of rocks
 pew-ter (n.), an alloy of lead and tin
 pf (n.), power factor
 pH (n.), a numerical measure of acidity and alkalinity of a chemical solution (7 is neutral; less than 7 is acid; 7-14 is alkaline)
 phan-tas-tron (n.), an electronic circuit
 phase (n.), a condition or state of matter such as liquid, solid, gas; also a point in a periodically repeating cycle; (v.), to gradually merge from one stage to another
 phase in-ver-ter (n.), an electronic circuit
 phase shift-er (n.), an electronic circuit
 phe-nol (n.), an organic chemical compound
 phe-no-lic (adj.), see phenol
 phe-nol-phtha-lein (n.), a chemical compound used as an indicator of acidity or alkalinity
 phe-nom-e-no-log-i-cal (adj.), relating to true occurrences
 phe-nom-e-non (pl. phenomena) (n.), an occurrence of a definable type
 phe-nyl (n.), an organic chemical radical
 phi (n.), a Greek letter, ϕ
 phil- (prefix), having a liking or affinity for
 -phil-ic (suffix), see phil-
 pH me-ter (n.), an instrument for measuring pH
 -pho-bic (suffix), having an aversion for; opposite of -philic
 phon- (prefix), sound

pho-non (n.), a unit or quantum of mechanical energy in a crystal lattice

-phore (suffix), carrying

-pho-re-sis (suffix), transmission

phos-gene (n.), an organic chemical compound

phos-phate (n.), a chemical radical of phosphorus

phos-phor (n.), a substance which glows when subjected to radiation

phos-pho-res-cence (n.), a glow that is the result of radiation and which persists after the radiation has ceased

phos-pho-rus (n.), a chemical element,
P

phot- or photo- (prefix), light

pho-to-cell (n.), a device that responds electrically to the incidence of light

pho-to-chem-is-try (n.), the study of the effect of light on chemical reactions

pho-to-con-duc-tiv-i-ty (n.), electrical conductivity increased by light radiation

pho-to-de-po-si-tion (n.), the laying down of layers of materials by photographic means

pho-to-elec-tric (adj.), relating to the effect of light on electrical properties

pho-to-en-grave (v.), to make indentations in a metal surface by means of a photographic and chemical process

pho-to-lu-mi-nes-cence (n.), the giving off of light as a result of excitation by light

pho-tom-e-ter (n.), an instrument that measures light intensity

pho-tom-e-try (n.), the science of the measurement of light

pho-to-mi-cro-graph (n.), a photograph taken through a microscope

pho-ton (n.), a unit of light intensity; also a quantum of radiant energy

pho-to-syn-the-sis (n.), a type of chemical reaction in plants as a result of irradiation with light

pho-to-tube (n.), a vacuum tube that may be modulated by light

pho-to-vol-ta-ic (adj.), relating the generation of voltage as a result of the impact of light

phtha-lein (n.), a chemical compound used as a dye

phtha-lic (n.), a chemical radical

phys-i-cal (adj.), relating to material things

phys-ics (n.), the science of the structure and activities of matter, excluding its chemical properties

pi (n.), a Greek letter, π ; also the ratio of the circumference of a circle to its diameter

pi-co (prefix), one trillionth

pic-ric (adj.), a kind of acid

piece-meal (adv.), piece by piece

pier (n.), a structural supporting member

pig-ment (n.) a material used to provide color

pig-men-ta-tion (n.), coloration

pi-las-ter (n.), a vertical supporting member

pile (n.), equipment used to generate atomic energy

pi-lot (adj.), referring to the first specimen of a given model

pin-a-coi-dal (adj.), a crystal system

pip (n.), a small vertical line on a cathode-ray tube screen indicating an incoming signal, an object signal in radar

pi-pette (n.), a glass tube used in sucking up or measuring quantities of liquid

pis-ton (n.), a metal cylinder which moves in a cylindrical chamber, causing mechanical action of a machine

pit (n.), a tiny indentation on a surface; (v.), to make tiny indentations

Pi-tot tube (n.), an instrument used in hydraulics
 piv-ot (n.), a pin on which something turns; (v.), to turn on a given spot
 piv-ot-al (adj.), crucial
 pla-nar (adj.), flat
 pla-nar tran-sis-tor (n.), a type of transistor
 plane (adj.), flat; (n.), a flat region; also a level for consideration; (v.), to make flat
 plan-et (n.), a heavenly body (such as the earth) that revolves around the sun
 plan-e-tar-y (adj.), having an orbit like a planet
 pla-nim-e-ter (n.), an instrument that measures area
 plant (n.), a factory building and its equipment
 plas-ma (n.), an ionized gas with an admixture of charged particles
 plas-tic (adj.), able to be formed or bent; (n.), a chemical material
 plate (n.), the anode of a vacuum tube; a lamellar structure; a film of electrodeposited metal; (v.), to make a film of metal by electrochemical deposition
 pla-teau (n.), a region of relatively small change
 plat-en (n.), a metal form against which things may be pressed
 plat-i-num (n.), a precious, metallic element, Pt
 plat-i-num black (n.), a powdery form of platinum
 plau-si-ble (adj.), believable
 pleth-o-ra (n.), an excess
 pli-able (adj.), flexible, easily yielding
 pli-an-cy (n.), a state of being flexible
 pli-ant (adj.), see pliable
 plot (n.), a graphical diagram; (v.), to draw with careful planning
 ploy (n.), a maneuver; a tactic
 plumb (adj.), exactly vertical; (v.), to examine deeply

plumb- (prefix), pertaining to lead
 plum-met (v.), to fall perpendicularly
 plu-ral-i-ty (n.), a majority, or a comparatively greater number
 plus (v.), to add; (n.), an advantage; (adj.), positive, in reference to electrical charge
 plu-to-ni-um (n.), a chemical element, Pu
 ply (n.), one of several layers
 pneu-mat-ic (adj.), referring to a machine that uses air or another gas
 pneumo- (prefix), air or gas
 po-lar (adj.), relating to objects having ends with opposite conditions of the same quality, such as positive and negative electricity; also opposite; also relating to coordinates that represent the position of an object
 po-lari-scope (n.), an instrument for measuring the amount of polarization of light
 po-lar-i-ty (n.), the quality of having two different poles or positions of opposite condition
 po-lar-iz-able (adj.), the ability to be polarized
 po-lar-ize (v.), to impart polarity; to make light waves vibrate in a particular pattern
 pole (n.), one end of a polarized structure
 pol-lute (v.), to render contaminated
 po-lo-ni-um (n.), a chemical element, Po
 poly- (prefix), many
 poly-chro-mat-ic (adj.), having many colors
 poly-es-ter (n.), a kind of chemical compound
 poly-eth-yl-ene (n.), a chemical compound, a plastic
 poly-gon (n.), a geometrical figure of many sides
 po-lyg-o-nal (adj.), see polygon
 poly-he-dral (adj.), relating to a polyhedron

poly-he-dron (n.), a solid made of many sides
 poly-mer (n.), a type of chemical compound with many units
 poly-mer-ic (adj.), relating to polymers
 poly-mer-iza-tion (n.), the process of combining chemical molecules to form larger molecules
 poly-sty-rene (n.), a chemical compound; a plastic
 poly-sul-fide (n.), a chemical compound of sulfur
 poly-ure-thane (n.), a chemical compound; a plastic
 poly-vi-nyl (n.), a chemical compound; a plastic
 pon-der-a-ble (adj.), able to be weighed
 pore (n.), a small opening
 po-ros-i-ty (n.), the quality of having pores
 po-rous (adj.), having pores
 port (n.), an opening
 por-ta-ble (adj.), able to be carried
 pos-i-tive (adj.), having a plus electrical charge
 pos-i-tron (n.), a sub-atomic particle
 post (v.), to list data
 post- (prefix), after
 pot (v.), to embed in an encapsulating material
 pot-ash (n.), a chemical compound, potassium carbonate
 po-tas-si-um (n.), a chemical element, K
 po-ten-cy (n.), see potent
 po-tent (adj.), powerful
 po-ten-tial (adj.), capable of action; latent
 po-ten-ti-om-e-ter (n.), an instrument for measuring voltage; also a device to vary voltage
 pow-der met-al-lur-gy (n.), the making of metal parts by pressing metal powders
 pow-er (n.), energy in a unit time; also the exponent to which a number may be raised; also ability to act; (v.), to supply with force to act
 prac-ti-ca-ble (adj.), able to be done, feasible
 prac-ti-cal (adj.), able to be done
 prac-tice (n.), the usual way of doing something
 prac-ti-tion-er (n.), one who performs a professional function
 prag-mat-ic (adj.), practical, factual
 pra-seo-dym-i-um (n.), a chemical element, Pr
 pre- (prefix), before
 pre-car-i-ous (adj.), uncertain, unstable
 pre-ce-dence (n.), coming first
 pre-ce-dent (n.), something that occurred earlier used as an example for future action
 pre-cess (v.), see precession
 pre-ces-sion (n.), a tilting of a rotating object
 pre-cip-i-tate (n.), a solid material which separates from a liquid; (v.), to cause a solid to deposit out of a liquid
 pre-cis (n.), a summary of essential facts
 pre-ci-sion (n.), exactness
 pre-clude (v.), to make impossible
 pre-con-di-tion (n.), something that must happen before something else can occur
 pre-de-ter-mine (v.), to assure in advance that something will occur
 pre-dict-a-ble (adj.), able to be foreseen
 pre-di-lec-tion (n.), a tendency toward preference
 pre-mier (adj.), first, chief
 prem-ise (n.), an introductory statement that is the basis of an argument or discussion
 pre-mi-um (adj.), best
 pre-pon-der-ant (adj.), having greater quantity, dominant
 pre-sage (v.), to foreshadow
 pres-sur-ize (v.), to fill a chamber with gas at an elevated pressure
 pri-ma fa-cie (adj.), on the first appearance
 prin-ci-pal (adj.), most important; (n.), a leader, chief or head

prin-ci-ple (n.), fundamental rule or law
 pri-or-i-ty (n.), something that comes before something else
 prism (n.), a solid of glass or crystal having regular, flat sides
 pris-mat-ic (adj.), see prism; also a crystal system
 pro- (prefix), in favor of, in front of
 prob-a-bil-i-ty (n.), the likelihood of something happening
 probe (v.), to examine thoroughly; to examine by feeling deeply into something with a long tool; (n.), a long tool used to contact something
 prob-lem-at-i-cal (adj.), expressing some doubt
 pro-cess (n.), an established way of doing something; (v.), to subject to a given procedure
 pro-cliv-i-ty (n.), a tendency toward
 pro-di-gious (adj.), very great in amount
 pro-file (n.), an outline
 pro-found (adj.), deep
 pro-fuse (adj.), in great numbers
 pro-fu-sion (n.), a great quantity
 prog-no-sis (n.), a prediction
 prog-nos-ti-cate (v.), to predict
 pro-gram (n.), a sequence of instructions for a computer; also a sequence of plans for achieving a goal
 pro-ject (v.), to plan, devise; also to represent in a drawing
 proj-ect (n.), a set task
 pro-jec-tile (n.), something thrown
 pro-lif-er-ate (v.), to grow rapidly by adding many parts
 pro-me-thi-um (n.), a chemical element, Pm
 prom-i-nent (adj.), standing out
 pro-mul-gate (v.), to make known; to declare
 proof (n.), a printed sheet which is to be examined for errors; also a measure of the strength of alcohol

prop (n.), a support; (v.), to support
 prop-a-gate (v.), to cause to extend
 pro-pane (n.), a gaseous organic chemical compound
 pro-pel (v.), to push forward
 pro-pel-lant (n.), the material which causes something to be pushed forward
 pro-pen-si-ty (n.), a tendency toward
 pro-pin-qui-ty (n.), nearness
 pro-pi-tious (adj.) favorable
 pro-por-tion-al (adj.), having the same, unchanging ratio or relationship
 pro-pri-etary (adj.), privately owned
 pro-pul-sion (n.), the act of pushing something forward
 pro-pyl (n.), an organic chemical radical
 pro-rate (v.), to divide up in proportion
 pro-sa-ic (adj.), ordinary
 pro-scribe (v.), to prohibit
 pro-spec-tus (n.), a detailed report giving plans for a new enterprise
 prot-ac-tin-i-um (n.), a chemical element, Pa
 pro-tag-o-nist (n.), one who supports a particular cause
 pro-ti-um (n.), an isotope of hydrogen
 proto- (prefix, first
 pro-ton (n.), a positively charged particle in the nucleus of atoms
 pro-to-plasm (n.), living material
 pro-to-type (n.), an original model which is used as an example
 pro-trac-tor (n.), a tool used in drawing and measuring angles
 pro-tu-ber-ant (adj.), extending out
 pro-vi-so (n.), a condition, stipulation
 prox-im-i-ty (n.), nearness
 pseud- or pseudo- (prefix), false
 psi (n.), a Greek letter, ψ
 P-type (adj.), semiconductor material doped with P-dopants
 pul-ley (n.), an arrangement of wheels and rope which aids in lifting and pulling
 pulse (n.), a sudden jolt, usually of electrical force
 pulse width (n.), the time a pulse of electrical energy lasts

pul-ver-ize (v.), to crush into powder
 punc-ture (v.), to pierce
 purge (v.), to cleanse thoroughly
 push-pull (adj.), a type of electronic circuit
 pyr-, pyro- (prefix), fire
 pyr-a-mid (n.), a solid with a flat bottom and triangular sides that meet at a point
 Py-rex (n.), a heat-resistant glass
 pyr-i-dine (n.), an organic chemical compound
 py-rite or py-ri-tes (n.), a mineral of iron
 py-ro-chem-i-cal (adj.), referring to reactions at elevated temperatures
 py-ro-lu-mi-nes-cence (n.), giving off of light as the result of heat
 py-rol-y-sis (n.), a chemical reaction brought about by the action of heat
 py-ro-lyt-ic (adj.), see pyrolysis
 py-ro-lyze (v.), see pyrolysis
 py-ro-met-al-lur-gy (n.), chemical reactions of metals at high temperatures
 py-rom-e-ter (n.), an instrument for measuring temperature
 py-ro-phor-ic (adj.), easily ignited
 py-ro-phos-phate (n.), a radical of phosphorus and oxygen

Q

quad- (prefix), four
 quad-rant (n.), one fourth of a geometrical figure; also an instrument for measuring altitudes
 qua-drat-ic (adj.), an algebraic expression containing a term that is raised to the second power
 quad-ri-lat-er-al (adj.), having four sides
 quad-ri-va-lent (adj.), having a chemical valence of four
 qual-i-fy (v.), to describe, to modify
 qual-i-ta-tive (adj.), referring to the qualities of something; descriptive; note difference from quantitative

qual-i-ty (n.), a characteristic or parameter
 quan-ti-fy (v.), to describe with exact numbers
 quan-ti-ta-tive (adj.), referring to the measurement of amounts in exact numbers
 quan-tize (v.), to express in terms of quantum mechanics
 quan-tum (pl. quanta) (n.), an irreducible interval or quantity
 quartz (n.), a mineral of silicon; also a glassy crystal having a very high melting point
 qua-si (adv., prefix), similar to, as though
 qua-ter-na-ry (adj.), consisting of four parts; also fourth in a series
 quench (v.), to extinguish; to douse in water
 que-ry (n.), question
 quick-sil-ver (n.), mercury
 qui-es-cent (adj.), quiet, inactive

R

rab-bet (n.), a groove or channel; (v.), to cut a groove or channel
 race (n.), a groove in which ball bearings roll
 rack (n.), a toothed bar used with a gear; a holder or support; (v.), to place objects into position on a rack
 ra-dar (n.), an electronic system used to locate objects
 ra-dar-scope (n.), the receiving screen of a radar set
 ra-di-al (adj.), spreading out from the center, like the radius of a circle
 ra-di-an (n.), a measure of angle
 ra-di-ant (adj.), see radiate
 ra-di-ate (v.), to emit rays
 ra-di-a-tor (n.), see radiate
 rad-i-cal (n.), in mathematics, a root; a mathematical expression under a radical sign, $\sqrt{\quad}$; in chemistry, a fundamental part of a compound; (adj.), extreme

ra-dio- (prefix), referring to something being emitted radially
 ra-dio-ac-tive (adj.), emitting subatomic particles and rays
 ra-dio-chem-is-try (n.), the branch of chemistry that deals with the dissociation of elements into isotopes and rays
 ra-dio fre-quen-cy (n.), the range of frequencies of electromagnetic waves used in radio and television, abbreviated r-f
 ra-dio-graph (n.), and X-ray photograph
 ra-di-og-ra-phy (n.), the process of taking pictures with X-rays
 ra-dio-iso-tope (n.), a radioactive isotope
 ra-dio-lu-mi-nes-cence (n.), a glow as a result of exposure to radiation
 ra-di-om-e-ter (n.), an instrument used to measure radiant energy
 ra-dio-sonde (n.), an electronic system for sending weather information from an unmanned balloon
 ra-di-um (n.), a radioactive chemical element, Ra
 ra-di-us (n.), a straight line from the center of a circle to the circumference
 ra-dix (n.), a number taken as the base of a number system
 ra-dome (n.), a dome-shaped structure for housing and protecting a radar antenna, usually on an airplane
 ra-don (n.), a chemical element, Rn: a dissociation product of radium
 ram-jet (adj.), a type of jet engine
 ramp (n.), a sloping pathway
 ran-dom (adj.), without pattern or plan
 ran-dom-ize (v.), to mix up so as to eliminate any order or planned arrangement
 range (n.), an extent
 rank (n.), a position in a series (v.), to arrange in positions according to some factor
 Ran-kine (n.), a temperature scale
 rar-efied (adj.), scant thin
 rasp (n.), a coarse file

ratch-et (n.), a metal tooth which prevents a gear from turning in the wrong direction
 rat-ed (adj.), a standard of performance
 rat-ing (n.), classification according to performance ability
 ra-tio (n.), a mathematical expression showing the relation of one factor to another
 ra-tio-nal (adj.), reasonable
 ra-tio-nale (n.), the basis
 ra-tio-nal-ize (v.), to perform a certain mathematical manipulation
 ray (n.), that which is radiated
 re (prep.), with regard to
 re- (prefix), again
 re-act(v.), to act on each other, especially with regard to chemical action
 re-ac-tance (n.), resistance to the flow of electrical current
 re-ac-tion (n.), the interaction between different things, particularly chemicals
 re-ac-ti-vate (v.), to render active again
 read-out (n.), a type of electronic circuit
 re-agent (n.), something that may take part in a chemical reaction
 re-cep-ta-cle (n.), a container
 re-cep-tor (n.), that which receives
 re-cess (n.), an indentation or interruption
 re-cip-ro-cal (adj., n.), opposite; in reverse proportion
 rec-la-ma-tion (n.), the process of returning something to use
 re-coil (v.), to spring back
 rec-on-cile (v.), to bring back into harmony
 re-crys-tal-lize (v.), to crystallize again after having existed in an amorphous state
 rec-ti-fy (v.), to convert alternating current to direct current
 re-cur (v.), to happen again

re-duce (v.), to remove oxygen; or to cause a reaction in which one product goes to a lower valence
 re-dun-dant (adj.), superfluous
 re-en-trant (adj.), leading inward
 re-fine (v.), to purify
 re-flec-tion (n.), the return of energy or an image from a surface
 re-flex (adj.), directed back
 re-fract (v.), to cause light waves to bend
 re-frac-tion (n.), the bending of light waves
 re-frac-tor (n.), a kind of telescope
 re-frac-to-ry (adj.), resistant to heat
 re-fute (v.), to disprove
 re-gen-er-ate (v.), to restore
 re-gen-er-a-tive (adj.), a kind of electronic circuit
 re-gime (n.), a regular pattern
 reg-i-men (n.), a set procedure
 re-gress (v.), to turn back to an earlier stage
 re-gres-sion (n.), the return to a less developed state
 re-gres-sive (adj.), see regression
 reg-u-late (v.), to make happen in accordance with rules
 re-i-fy (v.), to consider as a real thing
 re-in-force (v.), to strengthen
 re-it-er-ate (v.), to say again
 re-late (v.), to show a connection with
 rel-a-tive (adj.), having a connection with
 rel-a-tiv-i-ty (n.), a theory in physics showing that there is an equivalence between mass and energy
 re-lax-a-tion os-cil-la-tor (n.), an electronic circuit
 re-lay (n.), and electrical switch; also an electronic amplification station used in passing along television and other signals;
 (v.), to pass along
 rel-e-vant (adj.), pertinent
 re-lief (n.), something that stands out from a flat surface
 re-luc-tance (n.), resistance to magnetic influence
 re-luc-tiv-i-ty (n.), see reluctance
 re-me-di-a-ble (adj.), able to be fixed
 re-miss (adj.), negligent
 re-mote cut-off (n.), an electronic circuit
 re-nege (v.), to deny
 re-pro-duce (v.), to duplicate
 re-qui-site (adj.), essential
 re-search (v.), to investigate
 res-er-voir (n.), a place where something is stored
 re-sid-u-al (adj.), left over
 res-i-due (n.), that which is left over
 re-sil-ient (adj.), springy, elastic
 res-in (n.), a constituent of plastics
 re-sis-tance (n.), impedance to electric flow, expressed in ohms
 re-sis-tiv-i-ty (n.), the resistance offered by a unit volume of a substance
 re-sis-tor (n.), an electrical component that impedes the flow of electrical current; (adj.), an electronic circuit
 res-o-lu-tion (n.), the ability to make optical images distinct one from the other
 re-solve (v.), see resolution
 re-solv-ing pow-er (n.), the ability of a lens system to distinguish between two images lying close together
 res-o-nant (adj.), echoing
 re-spec-tive-ly (adv.), in a given order
 re-sponse (n.), to react as a result of stimulation
 re-spon-sive (adj.), reacting quickly
 res-ti-tu-tion (n.), restoration
 re-sume (n.), a short, summing-up, generally in reference to a career
 re-ten-tiv-i-ty (n.), the power of retaining magnetism
 ret-i-cle (n.), an eyepiece used in microscopic measurements
 re-triev-al (n.), getting desired information from a computer memory
 retro- (prefix), back, behind
 retro-ac-tive (adj.), make effective as of an earlier time

ret-ro-grade (adj.), moving backward
 re-tro-gres-sion (n.), reverting back
 to a lesser state
 re-ver-ber-ate (v.), to echo, to
 reflect
 re-ver-ber-a-tion (n.), an echo
 re-ver-ber-ato-ry (adj.), echoing,
 reflecting
 re-vers-i-ble (adj.), able to be
 reversed or to work in either
 direction
 rhe-ni-um (n.), a chemical element,
 Re
 rheo- (prefix), flow
 rhe-ol-o-gy (n.), the science that
 deals with the deformation of
 matter
 rheo-stat (n.), a variable resistor
 for controlling electrical current
 rho (n.), a Greek letter, ρ
 rho-di-um (n.), a precious metallic
 chemical element, Rh
 rhom-bo-he-dron (n.), a solid
 geometrical figure having four-
 sided faces
 rhom-bus (n.), a parallelogram having
 sides of equal length
 rib (n.), a strut
 rif-fling (n.), spiral grooves on the
 inside wall of a cylinder
 right an-gle (n.), an angle of 90° ,
 formed by two perpendicular
 lines
 riv-et (n.), a bolt used as a
 fastener
 ro-bot (n.), a machine that performs
 functions usually done by humans
 rock-et-ry (n.), the science of the
 manufacture and operation of
 rockets
 roent-gen (n.), a measure of X-ray
 radiation
 root (n.), a number which yields an
 indicated number when multiplied
 by itself a specified number of
 times
 root mean square (n.), a special
 mathematical average; rms
 ro-ta-me-ter (n.), an instrument for
 measuring the flow of fluids

ro-ta-ry (adj.), able to turn around
 an axis
 ro-tate (v.), to turn around an axis
 ro-ta-tion (n.), the act of rotating
 ro-tor (n.), the moving part in a motor
 ru-bid-i-um (n.), a chemical element,
 Rb
 ruby (n.), a crystal of aluminum oxide
 rust (n.), iron oxide, the corrosion
 product of iron
 ru-the-ni-um (n.), a chemical element,
 Ru

S

sac (n.), a non-rigid container for fluid
 sal (n.), salt
 sal am-mo-ni-ac (n.), a chemical compound,
 ammonium chloride
 sal-i-cyl-ic (n.), an organic chemical
 radical
 sa-lient (adj.), noticeable; prominent
 sa-line (adj.), salty; containing salts
 sa-lin-i-ty (n.), the degrees of
 saltiness
 sal-vage (v.), to obtain something
 useful from something that may
 be partially destroyed
 sa-mar-i-um (n.), a chemical element,
 Sm
 sam-ple (v.), to remove a representative
 quantity from a group or from a mass
 for testing
 sand-blast (v.), clean or roughen a
 surface by subjecting it to a rapid
 stream of sand
 sand-cast (v.), to pour liquid metal
 for a casting into a sand mold
 sap (v.), to drain
 sat-u-rate (v.), to completely
 penetrate and fill
 saw-tooth (n.), a wave form; an
 electronic circuit
 scan (v.), to sweep over something with
 a succession of rays of light or of
 electrons
 scan-di-um (n.), a chemical element, Sc

scar-i-fy (v.), to make scratches in a surface
 sche-mat-ic (n.), a diagram of an electrical, chemical, or mechanical, system
 scin-til-la (n.), a spark
 scin-til-late (v.), to sparkle
 scin-til-la-tion (n.), a spark or flash
 scope (n.), range or extent; also abbreviation for oscilloscope
 -scope (suffix), an instrument for viewing
 score (v.), to scratch a surface
 scru-ti-nize (v.), to examine closely
 scru-ti-ny (n.), examination
 seal (v.), to enclose in a watertight and airtight container
 seam (n.), a line formed where two parts join
 sear (v.), to scorch
 se-cant (n.), a trigonometric function, the ratio of the hypotenuse of a right triangle to the side adjacent to a given acute angle
 se-cond (n.), one sixtieth of a minute of time or of degree or arc
 sec-tion (v.), to cut a solid to reveal a plane surface; (n.), a diagram of a plane which was revealed by a cut through a solid
 sec-tor (n.), a pie-shaped section of a circle
 sed-i-ment (n.), dregs, the material that settles out of a liquid suspension
 sed-i-men-ta-ry (adj.), see sediment; also rocks formed by the sedimentation process
 sed-i-men-ta-tion (n.), the act of depositing sediment
 sed-u-lous (adj.), diligent
 seep-age (n.), liquid that oozes through a material
 see-saw (adj.), alternating
 seg-ment (n.), a part; (v.), to cut into parts
 seg-re-gate (v.), to put into separate groups
 seis-mic (adj.), referring to earthquakes
 seis-mo-graph (n.), an instrument that measures earthquakes and vibrations in the earth
 seis-mol-o-gy (n.), the study of vibrations in the earth
 seiz-ing (adj.), the locking together of moving parts
 se-lec-tiv-i-ty (n.), ability of an electronic circuit to discriminate between frequencies that are close together
 se-le-ni-um (n.), a chemical element, Se
 self- (prefix), directed toward or by itself
 self-lim-it-ed (adj.), limited by its own nature
 sel-syn (n.), a type of motor that turns exactly in accordance with the rotation of another separate part
 se-man-tics (n.), the study of the meanings of words
 semi- (prefix), half
 semi-au-to-mat-ic (adj.), referring to a mechanism that operates partially automatically and partially as guided by an operator
 semi-con-duc-tor (n.), a material that has an electrical conductivity midway between that of a metallic conductor and an insulator
 semi-met-al (n.), a material having only some of the qualities of a metal
 sem-i-nar (n.), a meeting held for the exchange of information on a given subject
 sen-sor (n.), a device that reacts to physical phenomena (light, heat, sound, etc.) by giving off a useful response
 sen-so-ry (adj.), referring to stimulation received by the human senses (sight, hearing, touch, etc.)
 sep-a-ra-ble (adj.), able to be separated
 se-pia (n.), a brown reproduction of a draftsman's drawing
 se-ques-ter (v.) to set apart
 se-ri-al (adj.), arranged in a given sequence, belonging to a series

se-ries (n.), a group of things in progressive order; the name of a group of mathematical expressions that have a significant sequence; (adj.), in a row; also referring to an electronic circuit
 ser-pen-tine (adj.), in a twisted, winding path
 ser-rat-ed (adj.), notched
 ser-vo (n.), see servomotor
 ser-vo-mo-tor (n.), a motor that turns exactly in accordance with a controlling mechanism
 set (n.), a group the members of which have a particular interrelation; (v.), to put into a particular position or condition
 set-up (n.), the way in which the elements of a mechanism or system are arranged
 sev-er (v.), to cut
 shale (n.), a kind of rock formation
 shear (n.), lateral stress
 sheath (n.), something which encases
 sheathe (v.), to provide with a sheath
 shed (v.), to flow off without penetrating
 shell (n.), the orbit of an electron inside an atom
 shim (n.), a thin piece of metal added to a structure to bring it to desired size; (v.), to build up a dimension by adding thin sheets of metal
 shock (n.), an electrical or mechanical jolt; (v.), to jolt
 shock wave (n.), a compressed wave in liquid or gas caused by something moving at great speed
 short (n., v.), see short circuit
 short cir-cuit (n.), an accidental, easy path for the flow of electrical current resulting in local overheating and burnout
 shunt (n.), a path parallel or alternate to the main path for the passage of electrical current; also the electrical resistor used in providing an alternate path
 shut-ter (n.), a movable plate that can open or close an opening
 side band (n.), the range of frequencies on either side of a carrier frequency
 si-de-re-al (adj.), referring to the stars
 sieve (v.), to sift
 sig-ma (n.), a Greek letter, Σ , σ
 sign (n.), a symbol representing a word, letter or direction
 sig-nal (n.), an arrangement of electrical waves that carries information
 signal-to-noise ratio (n.), a measure of the amount of unwanted noise in a radio circuit
 sil-i-ca (n.), the oxide of silicon, SiO_2
 sil-i-cate (n.), a chemical radical containing silicon
 si-li-ceous (adj.), containing silicon
 si-lic-ic (adj.), relating to silicon
 sil-i-cide (n.), a silicon compound
 sil-i-con (n.), a chemical element, Si; an important semiconductor material
 sil-i-cone (n.), a chemical compound of silicon which is similar to organic compounds
 sil-i-co-sis (n.), a disease of the lungs caused by breathing silica dust
 silk-screen (n.), a printing method
 si-lo (n.), a deep cylindrical hole in the ground for storing a missile
 sil-ver (n.), a heavy, precious metallic element, Ag
 sim-u-late (v.), to set up a situation which copies another
 sim-u-la-tor (n.), a device in a laboratory that duplicates conditions that may actually occur
 si-mul-ta-neous (adj.), at the same time
 sine (n.), a trigonometric function, the ratio of the side opposite an angle to the hypotenuse
 sine wave (n.), a wave whose intensity fluctuates up and down in cycles
 sin-gu-lar (adj.), unusual, individual

sink (n.), a place into which materials or energy may drain
 si-nus-oi-dal (adj.), referring to phenomena which may be represented in the form of sine waves
 si-phon (n.), an arrangement of tubes or pipes for drawing liquid out of a container
 site (n.), a particular location
 size (v.), to fill the pores of a material
 siz-ing (n.), a material used to fill pores
 sketch (v.), to make a simple drawing; (n.), a simple drawing
 sketchy (adj.) incomplete
 skew (adj.), slanted, oblique; not parallel; (v.), to make something deviate from a straight line
 skid (n.), a platform used in loading of material
 skin ef-fect (n.), conduction of high frequency electricity on a metal surface
 slab (n.), a thick plate
 slack (n.), a loose or relaxed portion
 slag (n.), the glassy material that floats to the top of liquid metal during its refinement
 slake (v.), to allow to absorb moisture
 slate (n.), a kind of rock
 slide (n.), a sliding part of a machine
 slip (n.), material used in making ceramic and porcelain ware
 slip-page (n.), the difference between the expected amount of power and the actual output
 slip ring (n.), a part of a rotating machine used to conduct electrical current
 slit (n.), a narrow opening used in optics
 sludge (n.), sediment
 sluice (n.), a channel for drawing away water
 slur-ry (n.), a thin mixture of solids in a liquid
 small sig-nal (n.), low power operation
 smoke (n.), a suspension of solid particles in a gas
 smol-der (v.), to burn slowly without flame
 smooth-bore (adj.), having a smooth inside surface
 smoth-er (v.), to suppress by depriving of oxygen
 snarled (adj.), all tangled up
 snor-kel (n.), a tube for conducting air into something submered in a liquid
 sock-et (n.), an opening for holding a part
 so-da (n.), the chemical, sodium carbonate
 so-da ash (n.), see soda
 so-di-um (n.), a chemical element, Na
 sol (n.), a kind of liquid solution
 so-lar (adj.), referring to the sun
 so-lar cell (n.), an electronic device that converts light to electricity
 so-lar-ize (v.), expose to the sun
 sol-der (v.), to join pieces of metal by melting and freezing another metal around them; (n.), the metal which will be melted for soldering
 sole (n.), the bottom or base of something
 so-le-noid (n.), a coil of wire used to open and close electrical switches
 so-lid-i-fi-ca-tion (n.), freezing or hardening
 sol-i-dus (n.), the range of temperatures below which an alloy or other mixture of materials is solid
 sol-u-ble (adj.), able to be dissolved; or able to be explained
 so-lute (n.), that which dissolves in a solution
 so-lu-tion (n.), a mixture containing a dissolved substance; also the answer to a problem
 solv-able (adj.), able to be explained
 sol-vent (n.), a substance in which another substance is dissolved

so-nar (n.), an electronic system that detects objects on or under the surface of water by the use of sound waves

sonde (n.), a class of instruments used for making high altitude measurements, particularly for weather analysis

son-ic (adj.), referring to audible sound

so-no-buoy (n.), a buoy that transmits sonar information

so-no-lu-mi-nes-cense (n.), giving off light as a result of sound

soot (n.), a very fine black powder formed by combustion

sorb (v.), to take up by absorption or adsorption and retain

sor-bate (n.), that which is sorbed

sor-bent (n.), that which sorbs

sorp-tion (n.), the process of sorbing

sort (v.), to separate into categories

sound (v.), to find out the depth of something

space charge (n.), the level of voltage in a region

spall (v.), to break off small chips

spar (n.), a supporting strut

spark (n.), an electric current conducted through a gas with a sudden flash

spark gap (n.), the space between two conductors across which a spark flashes

spa-tial (adj.), relating to space

spe-cif-ic (adj.), special for a particular use

spec-i-fi-ca-tion (n.), a set of plans, diagrams, or instructions for making a mechanism or for carrying out a job

spe-cif-ic grav-i-ty (n.), the weight of a unit of volume of a substance as compared with the weight of the same volume of another substance

spe-cif-ic heat (n.), the amount of heat required to raise the temperature of one gram of substance one degree

spec-i-fy (v.), to make a specification

spec-tral (adj.), relating to a spectrum

spectro- (prefix), spectrum

spec-tro-gram (n.), a picture of a spectrum

spec-tro-graph (n.), a machine for measuring spectra

spec-trom-e-ter (n.), an instrument for measuring the intensity of spectral lines

spec-trum (pl. spec-tra) (n.), the range of frequencies of any given periodic wave system (such as light waves, electromagnetic waves); also the separation and arrangement of parts of a wave in order of their possession of a specified quality

spec-u-lar (adj.), mirror-like

spec-u-late (v.), to consider a question; to guess

sphe-noi-dal (adj.), a crystal system

spher-i-cal (adj.), relating to a sphere

spher-oid (n.), an object which resembles a sphere

sphe-roi-dal (adj.), see spheroid

spie-gel-ei-sen (adj.), a type of crude iron alloy

spig-ot (n.), faucet

spill-age (n.), that which spills over

spin-dle (n.), the rod onto which something is wound

spi-nel (n.), a class of minerals

splice (v.), to join two wires or cables by intertwining their strands

spline (n.), a keyway

spon-ta-ne-ous (adj.), happening by itself, without outside stimulus

spo-rad-ic (adj.), occurring occasionally and without regularity

sprock-et (n.), a gear tooth on a wheel

sprue (n.), a hole in a mold through which liquid metal will flow to make a casting

spur (n.), a sharp projection

spu-ri-ous (adj.), false

square (n.), a four-sided figure having all right angles and all sides equal (v.), to raise to the second power, to multiply an expression by itself
 square root (n.), a factor of a number that, multiplied by itself, yields that number
 square wave (n.), an electrical wave form
 squee-gee (n.), a blade or roller used to squeeze liquid from the surface of flat objects
 sta-bil-i-ty (n.), the condition of being unchanging
 sta-bi-lize (v.), to put into an unchanging condition
 sta-bi-liz-er (n.), that which makes something stable
 sta-ble (adj.), unchanging
 stage (n.), a single electronic circuit in an electronic system
 stag-ing (n.) scaffolding
 stag-nant (adj.), not flowing, standing still
 sta-lac-tite (n.), a mineral deposit hanging from the roof of a cave
 sta-lag-mite (n.), a mineral deposit extending from the floor of a cave
 stamp (v.), to cut, bend, or emboss a material by means of a sudden impact with a die
 stamp-ing (n.), that which has been stamped
 stand by (v.), to be ready to act
 standing wave (n.), a wave which appears to stand still because its portions having zero amplitude remain in the same place
 staple (n.), a U-shaped pin used in fastening
 star (adj.), referring to a type of electronic circuit
 state (n.), a condition something is in
 stat-ic (adj.), unmoving; (n.), electrical disturbance

stat-ics (n.), the branch of mechanics that deals with bodies at rest
 sta-tis-tic (n.), a single datum or piece of information
 sta-tis-tics (n.), a the branch of mathematics that deals with the collection, organization, and interpretation of masses of numerical information
 stato- (prefix), resting; also at equilibrium
 sta-tor (n.), the part of a machine that stands still
 sta-tus (n.), condition
 steady state (adj.), a constant condition
 stea-rate (n.), a salt of stearic acid
 stear-ric (adj.), relating to a kind of organic acid
 ste-atite (n.), the mineral soapstone
 steel (n.), an alloy of iron
 sten-cil (v.), to print a pattern by painting over holes in a form
 step-up (adj.), a type of transformer connection
 stereo- (prefix), solid, three-dimensional
 ste-reo-chem-is-try (n.), the branch of chemistry that deals with the arrangements of atoms in space
 ste-reo-graph (n.), a picture which makes an object look solid
 ste-re-og-ra-phy (n.), the process of making stereographs
 ste-reo-scop-ic (adj.), relating to the ability to see objects from several vantage points at the same time so that they appear three-dimensional
 ste-reo-type (n.), something typical or conforming to a pattern
 still (n.), an apparatus used for distilling liquids in order to purify them
 stip-u-late (v.), to make a requirement
 stip-u-la-tion (n.), a requirement
 stock-pile (v.), to save up; to store

stoi-chio-met-ric (adj.), in definite proportion; referring to the balance of factors in chemical equations
 stor-age (n.), a type of electronic circuit; also the computer memory
 stor-age cell (n.), an electrolytic cell, a battery
 strain (n.), the amount something stretches as a result of an applied force; (v.), to cause to stretch or change dimension
 strat-a-gem (n.), a clever tactical maneuver
 strati- (prefix), in layers
 strat-i-fy (v.), to arrange in layers
 strato-sphere (n.), the layer of atmosphere starting seven miles up from the earth
 stra-tum (pl. stra-ta) (n.), a layer
 stream-line (n.), a contour constructed so that fluids can flow easily around the object
 stress (n.), a force which may strain an object
 stri-at-ed (adj.), covered with fine, parallel grooves or lines
 strip (v.), to remove a layer
 stron-tium (n.), a chemical element, Sb
 struc-ture (n.), the physical make-up of a material
 strut (n.), a structural member
 sty-lus (n.), a needle-like tool
 sty-rene (n.), an organic chemical compound
 sub- (prefix), under
 sub-atom-ic (adj.), particles smaller than atoms
 sub-class (n.), a subdivision of a class
 sub-con-trac-tor (n.), a company that works for another company which is under contract for a whole job
 sub-ject (v.), to cause something to undergo a certain action
 sub-li-ma-tion (n.), the change of physical state from solid to gas
 sub-or-din-ate (adj.), in a lower class

sub-ox-ide (n.), an oxide containing a comparatively small amount of oxygen
 sub-script (n.), a number or symbol written a half space below a mathematical, physical, or chemical expression
 sub-sid-iary (adj.), aiding or secondary
 sub-son-ic (adj.), moving at less than the speed of sound
 sub-strate (n.), an underlying base material upon which materials are deposited
 sub-stra-tum (n.), a layer just under the surface
 sub-tra-hend (n.), the number which is to be subtracted from another number
 suc-ces-sion (n.), the order in which something happens
 suc-ces-sive-ly (adv.), in order
 su-crose (n.), an organic chemical compound; a sugar
 suc-tion (n.), the act of applying a partial vacuum
 suf-fuse (v.), to spread over
 sulfa- (prefix), relating to sulfur
 sul-fate (n.), a radical of sulfur
 sul-fide (n.), a compound of sulfur
 sul-fo-nate (v.), to convert into sulfonic acid; (n.), a salt of sulfur
 sul-fone (n.), a sulfur compound
 sul-fon-ic acid (n.), a sulfur-containing acid
 sul-fo-nyl (n.), a sulfur radical
 sul-fur or sul-phur (n.), a chemical element, S
 sul-fu-ric (adj.), pertaining to sulfur; a sulfur radical
 sum (n.), the result of adding; (v.), to add
 sum-ma-rize (v.), to make a summary
 sum-ma-ry (n.), concise summing-up of what has been presented
 sum-ma-tion (n.), the sum
 sum-mer (adj.), an electrical circuit, used especially in computers
 sump (n.), a container for drained fluids

super- (prefix), in addition;
greater than
su-per-a-ble (adj.), able to be
overcome
su-per-con-duc-tiv-i-ty (n.), elec-
trical conduction in the absence
of resistance which occurs at
very low temperatures
su-per-cool (v.), to cool so rapid-
ly that a substance remains liquid
below its freezing point
su-per-fi-cial (adj.), only the
surface
su-per-flu-ous (adj.), extra, un-
needed
su-per-heat (v.), to heat a substance
above its boiling point and still
keep it liquid
su-per-het-ero-dyne (adj.), a kind
of electronic system (a radio
usually) which subtracts out the
signal frequency from other
frequency ranges
su-per-phos-phate (n.), a chemical
mixture of phosphorus compounds
su-per-sat-u-rate (v.), to dissolve
more solute into a solvent than
it can normally hold
sup-er-script (n.), a number written
half a space above an expression
su-per-sede (v.), to take the place
of
su-per-son-ic (adj.), faster than
sound
su-per-struc-ture (n.), a structure
added as an extension of a basic
structure
sup-plant (v.), to take the place of
sup-ple-ment (n.), something that
is added to something else; also
the angle which, when added to
another angle, equals 180°
sup-ple-men-ta-ry (adj.), see
supplement
supra- (prefix), above
sup-press (v.), to inhibit
sur- (prefix), over
sur-face (v.), to make smooth
sur-veil-lance (n.), watching by
electronic means

sur-vey (v.), to measure and stake
out a piece of land
sus-cep-ti-bil-i-ty (n.), an elec-
trical quality of a dielectric
sus-pend (v.), to hang; to postpone
sus-pen-sion (n.), a system for hang-
ing something; also a liquid; solid,
or gas in which solid matter floats
without settling out
swage (v.), to shape metal by hammering
sweep (v.), to examine a surface elec-
tronically; also an electronic
circuit
switch-ing (adj.), an electronic
circuit
swiv-el (n.), a device for allowing a
part to pivot
sym-bol (n.), a mark or letter used
to represent something
sym-bol-ize (v.), to show with symbols
sym-met-ri-cal (adj.), balanced
sym-me-try (n.), a state of balance
sym-po-sium (n.), a meeting to discuss
a particular subject
symptom (n.), something that indi-
cates that a particular phenomenon
exists or has occurred
syn- (prefix), with
sync or synch (n.), synchronization
syn-chro (n.), a selsyn or synchronous
motor
syn-chro- (prefix), referring to
synchronization
syn-chro-nism (n.), the quality of
occurring simultaneously
syn-chron-i-za-tion (n.), the act of
occurring simultaneously
syn-chro-niz-ing (adj.), a type of
electronic circuit
syn-chro-tron (n.) an apparatus for
giving very high speeds to charged
particles
syn-drome (n.), a set of symptoms
typical of a particular condition
syn-the-sis (n.), the construction
or production of something from its
essential, basic parts
syn-thet-ic (adj.), artificial
sys-tem (n.), an assemblage of items
and groups of items that forms a
meaningful whole

sys-tem-at-ic (adj.), consisting of
a system; organized
sys-tem-a-tize (v.), to put into a
system

T

tab (n.), a projecting piece
tab-u-lar (adj.), data arranged
in regular rows and columns
tab-u-late (v.), see tabular
ta-chom-e-ter (n.), an instrument
for measuring the speed of
rotation
tac-o-nite (n.), a kind of mineral
tac-tic (n.), a method of procedure
tac-tile (adj.), perceptible by
touch
tail-ings (n.), that which is left
over, useless residue
tail-stock (n.), part of a lathe
tal-ly (n.), the counting up, the
score; (v.), to count up; to
make correspond
tamp (v.), to press by a series
of blows
tan-dem (adj.), in order, one
behind the other
tan-gen-cy (n.), state of being
tangent
tan-gent (n.), the ratio of the
length of the side opposite an
acute angle in a right triangle
to the side adjacent; (adj.),
the intersection of a line with
a curved surface at only one
point; also referring to a
grazing contact
tan-gen-tial (adj.), relating to
that which is tangent; also
veering off at a different
angle or approach, divergent
tan-gi-ble (adj.), able to be
touched, real
tank (n.), a type of electronic
circuit
tan-nic ac-id (n.), an organic
acid

tan-nin (n.), an organic
chemical compound
tan-ta-lum (n.), a chemical
element, Ta
tap (v.), to machine threads into
a hole; also to remove fluid
from a container; (n.), a tool
used to make threads in a hole
tape (v.), to record on magnetic
tape
ta-per (n.), a gradual lessening
of dimension of a rod; (v.), to
make a gradual lessening in a
dimension
tap-pet (n.), a small lever used
in engines
tare (n.), the weight of a container
deducted from the total weight to
give only the weight of the con-
tents of the container; also a
counterweight
tar-get (n.), the object in a vacuum
tube which is stuck by a stream
of electrons
tar-tar-ic ac-id (n.), an organic
acid
tar-trate (n.), a salt of tartaric
acid
tau (n.), a Greek letter, τ
taut (adj.), tight
taut- (prefix), same
tax (v.), to strain the capabilities
of
tax- (prefix), arrangement
taxi (v.), to move an airplane at
low speed on the ground
tax-on-o-my (n.), the study of
the principles of classification
tech-ne-tium (n.), a chemical
element, Tc
tech-ni-cal (adj.), organized in
accordance with scientific
thinking
tech-ni-cal-i-ty (n.), a detail
having significance only to a
specialist
tech-ni-cian (n.), one who can apply
the material of engineering and
science

tech-nique (n.), a procedure, or way of doing something
 tech-no-log-i-cal (adj.), relating to technology
 tech-nol-o-gy (n.), the means used to attain a given purpose; also applications of scientific findings for useful purposes
 tec-ton-ics (n.), the branch of geology dealing with the effects of great pressures on the earth's crust
 tele- (prefix), at a distance
 tele-com-mu-ni-ca-tion (n.), sending messages over great distances
 teleg-ra-phy (n.), use of the telegraph to send and receive messages
 tele-me-ter (v.), to send measurements by an automatic instrument from a distance
 tel-lu-ride (n.), a compound of tellurium
 tel-lu-ri-um (n.), a chemical element, Te
 tem-per (n.), the springiness of a piece of metal; (v.), to subject metal to heat to enhance its mechanical qualities; also to make an argument less strong
 ten-a-ble (adj.), capable of being defended by reason
 te-na-cious (adj.), hard to pull apart, holding tightly
 te-na-ci-ty (n.), see tenacious
 tend (v.), to move in a particular direction
 te-net (n.), a principle on which something is based
 ten-or (n.), the general tendency
 ten-sile (adj.), relating to tension
 ten-si-om-e-ter (n.), an apparatus for measuring tension
 ten-sion (n.), the pull or stretch; also the amount of voltage difference or potential that may exist between two points
 ten-sor (n.), a mathematical expression
 ten-ta-tive (adj.), uncertain
 ten-u-ous (adj.), thin; flimsy
 ter-bi-um (n.), a chemical element, Tb
 term (n.), a part of a mathematical expression separated from the other parts by plus or minus signs; also the end; also a provision or condition
 ter-mi-nal (n.), the place to which electrical connections are made on an electrical component
 ter-mi-nate (v.), to close or to end
 ter-mi-nol-o-gy (n.), the definitions and symbols used in a given activity; the nomenclature
 ter-mi-nus (n.), the place at which something ends
 ter-na-ry (adj.), threefold
 ter-tial (adj.), third
 ter-ti-ar-y (adj.), of the third rank
 tetra- (prefix), four
 te-trag-o-nal (adj.), having four angles
 tet-ra-he-dral (adj.), having four sides
 tet-ra-va-lent (adj.), having a chemical valence of four
 tet-rode (n.), an electrical device having four active elements
 te-trox-ide (n.), an oxide having four atoms of oxygen
 tet-ryl (n.), an organic chemical compound
 tex-tu-al (adj.), relating to a text
 tex-ture (n.), the way something is put together, especially at the surface
 thal-li-um (n.), a chemical element, Tl
 the-o-rem (n.), a principle that can be demonstrated by using known facts
 the-o-ret-i-cal (adj.), speculative, abstract, not necessarily based on experiment

the-o-ry (n.), a speculation, a principle with some basis in fact
 ther-mal (adj.), relating to heat
 therm-ion (n.), a charged particle emitted from a red-hot substance
 therm-ion-ic (adj.), referring to electrically charged particles emitted from hot surfaces
 therm-is-tor (n.), an electrical component that changes its electrical resistance as a function of temperature
 thermo- (prefix), heat
 ther-mo-cou-ple (n.), a device made of two dissimilar pieces of metal which generate an electrical voltage as a result of temperature changes at the metal junction
 ther-mo-dy-nam-ics (n.), the physics of heat and energy
 ther-mo-elec-tric-i-ty (n.), electrical current generated by heat; also a technique of cooling electricity (the Peltier effect)
 ther-mo-lu-mi-nes-cence (n.), giving off light as a result of heat
 ther-mo-pile (n.), a device consisting of many thermocouples, generates substantial current
 ther-mo-plas-tic (adj.), able to be formed when warm
 ther-mo-set-ting (adj.), hardening as a result of heat
 ther-mo-stat (n.), a device for maintaining a set temperature
 the-sis (n.), a proposition
 the-ta (n.), a Greek letter, θ
 thi-a-zole (n.), an organic chemical compound
 thin-ner (n.), a solvent which will dilute a solution
 thio- (prefix), sulfur
 thio-phos-phor-ic ac-id (n.), a chemical compound
 thio-sul-fu-ric ac-id (n.), a chemical compound
 tho-ria (n.), thorium oxide
 tho-ri-um (n.), a chemical element, Th
 thu-li-um (n.), a chemical element, Tm
 thy-ra-tron (n.), a type of electron tube
 tile (n.), a slab made of ceramic
 tim-bre (n.), a quality of tone which makes it sound distinctive
 tim-ing (n.), a sequence of occurrences preset for definite time intervals
 tin (n.), a chemical element, Sn
 tin foil (n.), a thin sheet of metal not necessarily of tin
 tin-ny (adj.), made of light material; cheap
 tip-off (v.), to pinch a piece of tubing thus cutting and sealing it
 ti-ta-ni-um (n.), a chemical element, Ti
 ti-trate (v.), see titration
 ti-tra-tion (n.), the doling out of measured quantities of liquids until a indicator shows that a chemical balance is achieved in a solution
 TNT (n.), an explosive, trinitro-toluene
 tog-gle switch (n.), an electrical switch operating by flipping a small metal rod
 tol-er-ance (n.), the amount a measurement is allowed to vary
 tol-u-ene (n.), an organic solvent
 tol-u-ol (n.), toluene (commercial grade)
 tooth (n.), one of a set of projections on a gear
 to-pog-ra-phy (n.), the representation of features of land on a map
 to-roid (n.), a doughnut-shaped object
 to-roi-dal (adj.), see toroid
 torque (n.), a force that tends to produce rotation or twisting
 tor-sion (n.), the stress in a material as a result of torque

tour-ma-line (n.), a silicate mineral
 tox-ic (adj.), poisonous
 trace (n.), a tiny amount
 tracer (n.), a radioactive chemical used to indicate movement of chemicals
 trac-tile (adj.), able to be stretched
 tra-jec-to-ry (n.), the path taken by a projectile in flight
 trans- (prefix), across
 trans-ceiv-er (n.), a receiver-transmitter combination that uses many of the same electronic components for both receiving and sending
 trans-con-duc-tance (n.), a property of vacuum tubes, abbreviated μ or G_m
 trans-duc-er (n.), a device that receives a signal in one form of energy and changes it to another form
 trans-fi-nite (adj.), beyond finite values
 trans-for-ma-tion (n.), a mathematical operation
 trans-for-mer (n.), a device that changes the current-voltage distribution of alternating electricity
 tran-sient (n., adj.), something that comes and goes; short-lived
 tran-sis-tor (n.), a small electronic component made of semiconductor material, that performs the jobs done by radio tubes
 tran-sis-tor-ize (v.), to change an electronic system from tubes to transistors
 tran-si-tion (n.), a change from one state or place to another
 tran-si-to-ry (adj.), temporary
 trans-late (v.), to move something from one place or form to another
 trans-la-tion (n.), the movement of something from one place or form to another
 trans-lu-cent (adj.), transmitting light in a diffuse manner
 trans-mis-sion (n.), the sending of signals
 trans-mit (v.), see transmission
 trans-mit-ter (n.), the electronic system that sends out signals
 trans-mu-ta-tion (n.), the changing of one element into another
 tran-spon-der (n.), radio system that automatically responds when it receives a signal
 trans-pose (v.), to change the relative position of mathematical expressions
 trans-ura-ni-um (adj.), having a greater atomic number than uranium
 trans-verse (adj.), lying across
 trap (n.), a crystalline defect in a semiconductor that prevents carriers of electricity from moving through
 trap-e-zoid (n.), a four-sided figure having only two parallel sides
 tra-verse (v.), to move across
 tri- (prefix), three
 tri-ad (n.), a group of three
 tri-an-gle (n.), a three-sided plane figure
 tri-an-gu-lar (adj.), relating to triangles
 tri-an-gu-late (v.), to make triangles
 tri-clin-ic (adj.), relating to crystal form
 trig-o-no-met-ric (adj.), referring to trigonometry
 trig-o-nom-e-try (n.), the branch of mathematics that deals with properties of triangles on surfaces and in solids
 tril-lion (n.), a million times a million, or a thousand billion, 10^{12}
 tri-no-mi-al (n.), a mathematical expression having three terms
 tri-ode (n.), a three-element vacuum tube or semiconductor device

tri-ox-ide (n.), an oxide containing
 three atoms of oxygen
 trip-ler (n.), a type of electronic
 circuit
 trip-let (n.), a group of three
 tri-ti-um (n.), an isotope of
 hydrogen
 tri-va-lent (adj.), having a
 valence of three
 -tron (suffix), an instrument or
 device
 tro-po-sphere (n.), a layer of
 the atmosphere below the
 stratosphere
 trough (n.), a channel
 troy weight (n.), a system of
 units of weight based on a
 pound having 12 ounces
 true (adj.), well lined-up,
 accurate
 trun-cate (v.), to cut off a
 part and replace it with
 a flat plane; to shorten by
 cutting
 tube (n.), a hollow pipe;
 also an electronic device
 capable of rectifying and
 amplifying
 tub-ing (n.), something having
 the shape of a hollow pipe
 tu-bu-lar (adj.), tube-like
 tum-ble (v.), to throw objects
 around inside a barrel in order
 to round off their corners
 and smooth off rough surfaces
 tuned (adj.), a type of electronic
 circuit
 tung-sten (n.), a chemical
 element, W; also called wolfram
 tur-bid (adj.), muddy, obscured
 tur-bine (n.), an engine run by
 the flow of liquids of gas
 turbo- (prefix), turbine
 tur-bu-lent (adj.), violently
 agitated
 tur-ret (n.), a holder for
 tools in a machine
 twin (n.), a crystal form
 in which two parts of a crystal
 are mirror images; (v.), to
 form a twin crystal

ty-ro (n.), a neophyte, a novice

U

ubiq-ui-tous (adj.), being every-
 where at the same time
 -u-lar (suffix), relating to
 -u-lent (suffix), abounding in
 ul-ti-mate (adj.), the farthest
 out, basic, fundamental, eventual
 ul-tra- (prefix), beyond
 ul-tra high fre-quen-cy (n.), a
 rapid electromagnetic wave, uhf
 ul-tra-son-ic (adj.), sound
 waves of higher frequency than
 audible sound
 ul-tra-vi-o-let (adj.), light
 waves of higher frequency than
 visible light but slower than
 X-rays
 um-bra (n.), a shadow
 un- (prefix), contrary to; not
 un-coil (v.), to unwind
 un-der-cut (v.), to cut away a
 portion of something so as to
 leave an overhanging region
 un-du-late (v.), to move in waves
 uni- (prefix), single; one
 uni-fy (v.), to make into a single
 system
 uni-po-lar (adj.), having only
 one electrical or magnetic
 pole
 unique (adj.), the only one;
 without similarity
 unit (n.), an independent part of
 a system
 unit cell (n.), the smallest
 atomic arrangement of a crystal
 uni-va-lent (adj.), having a valence
 of one
 uni-verse (n.), a particular en-
 vironment in which an experiment
 is carried out
 un-sta-ble (adj.), not stable;
 unsteady, fluctuating
 up-si-lon (n.), a Greek letter, υ
 ura-ni-um (n.), a chemical element, U
 -ure (suffix), a process

urea (n.), an organic chemical compound
urethane (n.), an organic chemical compound
-ur-gy (suffix), the art of dealing with material
us-age (n.), the amount used

V

va-cu-ity (n.), an empty space
vac-u-um (n.), the absence of material
va-lence (n.), the number of bonds available for chemical reaction which an atom or a radical may have; the number of electrical charges on an atom or radical
val-id (adj.), sound, true
val-i-date (v.), to confirm
val-ue (n.), the amount of anything expressed mathematically
valve (n.), a mechanism that opens or closes a passage; also a radio tube (British); (v.), to open or close a passage
va-na-di-um (n.), a chemical element, V
vane (n.), part of a mechanism that can be moved by the flow of fluids
va-por (n.), a material in the gaseous state
va-por-ize (v.), to cause to turn into vapor
va-por pres-sure (n.), the pressure exerted by a vapor
var-ac-tor (n.), a semiconductor diode that has variable reactance
vari- (prefix), varied
vari-able (n.), a symbol in a mathematical expression that can assume any value
vari-ance (n.), the amount something varies from a predicted amount

vari-ant (n.), that which does not conform with a standard
va-ris-tor (n.), a resistor whose resistance changes as voltage changes
vary (v.), to change
vec-tor (n.), a mathematical expression that represents both quantity and direction, often indicated by an arrow above the expression
ve-hi-cle (n.), a structure in which an experiment may be carried out; also an inactive medium in which another substance may be carried
vein (n.), a mineral deposit
ve-loc-i-ty (n.), the speed of movement
ve-neer (n.), a surface layer of good appearance
vent (n.), an opening to allow for the escape of gas; (v.), to make openings for the escape of gases
ven-ti-late (v.), to expose to air
ven-tu-ri (n.), a structure in a pipe
ve-rac-i-ty (n.), truthfulness
ver-ba-tim (adv.), in the exact words
ver-i-fy (v.), to confirm, establish
ver-mic-u-late (n.), mica-containing mineral
ver-ni-er (n.), a fine adjustment, or measuring device, consisting of a small scale
ver-sa-tile (adj.), able to act in a variety of areas
ver-sus (prep.), against; also refers to connections between variables graphed as functions of each other
ver-tex (pl. ver-ti-ces) (n.), the point at the top
ver-ti-cal (adj.), straight up and down, perpendicular
ves-sel (n.), a container

ves-tige (n.), a trace of something;
 a scrap
 via (prep.), by way of or by means
 of
 vi-a-ble (adj.), workable
 vi-al (n.), a small container
 vi-bra-tion (n.), a set of repeated
 oscillations
 vi-bra-tor (n.), a mechanism that
 vibrates
 vi-bra-to-ry (adj.), see vibration
 vid-eo (n.), that which can be seen
 in television
 vid-i-con (n.), a camera used in
 television
 vi-nyl (n.), an organic chemical
 radical; or a class of plastics
 vir-tu-al (adj.), almost actual,
 but not in fact real
 vir-u-lent (adj.), very harsh
 and strong
 vis-cos-i-ty (n.), thickness or
 runniness of a liquid
 vis-cous (adj.), see viscosity
 vise (n.), a tool for holding
 parts while they are worked
 on
 vi-su-al-ize (v.), to form a mental
 image; to imagine
 vi-ti-ate (v.), to make ineffective
 vit-re-ous (adj.), glassy
 vit-ri-fy (v.), to melt and make
 into a glassy substance
 void (n.), a vacuum; (v.), to
 empty; (adj.), empty
 vol-a-tile (adj.), easily vaporized
 volt (n.), the unit of electrical
 force or potential
 volt-age (n.), the amount of
 electrical potential
 vol-ta-ic (adj.), referring to
 voltage
 volt-am-pere (n.), a watt; or the
 unit of electrical power which
 is the product of volts and
 amperes
 vol-u-met-ric (adj.), referring
 to the measurement of volume
 vor-tex (n.), (pl. vor-ti-ces),
 a swirl of rotating liquid

vul-can-iza-tion (n.), a thermal
 or chemical treatment of rubber
 to improve its properties

W

ware (n.), manufactured articles
 warp (v.), to twist or turn out
 of shape
 watt (n.), the unit of electrical
 power equal to volts times amperes
 watt-age (n.), the amount of elec-
 trical power
 watt-hour (n.), a unit of electrical
 energy
 watt-meter (n.), an instrument for
 measuring power
 watt-second (n.), a unit of energy
 wave (n.), periodic movement, or
 variation, which transmits energy
 in passing through a medium
 wave band (n.), a range of radio
 frequencies
 wave guide (n.), a metal pipe for
 conducting microwaves of a given
 frequency
 wave-length (n.), the length, time,
 or period of a single wave
 wear (v.), to cause a surface to be
 ground away as a result of
 repeated rubbing; (n.), the
 result of wearing
 web (n.), a thin portion between
 heavy sections
 we-ber (n.), a unit of magnetic
 flux
 wedge (n.), a chisel-shaped piece
 of metal, which tapers to a
 thin edge; (v.), to force in
 between
 weight-ed (adj.), extra importance
 given to some data
 weld (v.), to join pieces together
 by local melting and freezing;
 (n.), the place where a welded
 joint was made
 weld-ment (n.), an object formed of
 welded pieces

well (n.), a deep container
 well-found-ed (adj.), based on
 correct reasoning and valid
 data
 wet-ta-bil-i-ty (n.), ability to
 be wetted
 wet-ta-ble (adj.), able to be wetted
 whisk-er (n.), a fine wire
 whorl (n.), a spiral, coiled curve
 wil-lem-ite (n.), a mineral of zinc
 wind-ing (n.), the wound wire of
 an electrical coil or transformer
 wire (v.), to connect electrical
 systems with wire
 wir-ing (n.), the wire connections
 in electrical circuits
 wob-ble (n.), an uneven, irregular
 motion
 wolf-ram (n.), a chemical element,
 W; also known as tungsten
 work-a-ble (adj.), referring to the
 ability of a material to be bent
 and formed
 worm gear (n.), a type of gear
 wrench (n.), a tool; also a violent,
 twisting pull
 wrought (adj.), manufactured

X

xan-thene (n.), an organic
 chemical compound
 xe-non (n.), a chemical element,
 Xe
 xe-rog-ra-phy (n.), a method of
 image reproduction
 xi (n.), a Greek letter, Ξ , ξ
 X-ray (n.), a high-frequency
 electromagnetic wave
 X-ray lu-mi-nes-cence (n.),
 giving off light as a result
 of X-ray impact
 xy-lene (n.), an organic chemical
 solvent
 xy-lol (n.), see xylene

Y

ya-gi (n.), a type of antenna
 yaw (v.), to swerve
 yield (v.), to give way under
 force; (n.), the amount of
 output of a process
 yt-ter-bi-um (n.), a chemical
 element, Yb
 yt-tri-um (n.), a chemical element,
 Y

Z

ze-ner (n.), a type of semicon-
 ductor diode
 ze-nith (n.), the highest point
 ze-o-lite (n.), a type of mineral
 ze-ro (n.), the state of total
 absence of quantity; (v.), to
 find a lowest starting point
 ze-ta (n.), a Greek letter, Z , ζ
 zinc (n.), a chemical element, Zn
 zinc-ate (n.), zinc compound
 zinc blende (n.), a zinc mineral
 zir-con (n.), a zirconium mineral
 zir-co-nia (n.), zirconium oxide
 zir-co-ni-um (n.), a chemical
 element, Zr
 zone (n.), a region; (v.), to
 mark into regions
 zy-mur-gy (n.), the study of the
 chemistry of fermentation

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