Comprendiendo Inglés Técnico-Científico

Inglés Técnico 1

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EJERCICIO 1.1

SUSTANTIVOS (Plurales y singulares)

Escriba las formas plurales de los siguientes sustantivos:

battery ……	law ……
axis ……	phase ……
woman ……	branch ……
glass ……	nucleus ……
knife ……	medium ……
theory ……	dish ……
tooth ……	potato ……
number ……	box ……
window ……	score ……
criterion ……	leaf ……

EJERCICIO 2.1

EL ARTÍCULO DEFINIDO "THE" Y EL INDEFINIDO "A" ("AN")

Traduzca las siguientes combinaciones

1) the energy ……
2) the time ……
3) the effects ……
4) a result ……
5) an increase ……
6) a way ……
7) the conditions ……
8) the future ……
9) the engineer ……
10) the classes ……

EJERCICIO 2.2

Complete los espacios en blanco con "a" o "an" según corresponda y traduzca

1) ..... property .....
2) ..... buzz .....
3) ……. axis .....
4) ……. echo .....
5) …….. hero .....
6) ……. advance .....

GLOSARIO DEL EJERCICIO 1.1

Palabra	Función	Significado	Otra función y significado	
axis	s	eje		
basis	s	fundamento, base		
battery	s	batería		
box	s	caja, cajón		
branch	s	rama, sucursal		
charge	s	carga	v	cargar
cheap	adj	barato		
chief	s	jefe	adj	principal
child	s	niño, chico/a		
class	s	clase		
criterion	s	criterio		
datum	s	dato		
dish	s	plato		
dynamo	s	dínamo, generador		
flash	s	destello	v	destellar
foot	s	pie		
function	s	función	v	funcionar
glass	s	vidrio, vaso		
half	s	mitad		
knife	s	cuchillo		
law	s	ley		
leaf	s	hoja		
life	s	vida		
man	s	hombre		
maximum	s	máximo		
medium	s	medio		
memory	s	memoria		
minimum	s	mínimo		
nucleus	s	núcleo		
number	s	número		
phase	s	fase		
phenomenon	s	fenómeno		
piano	s	piano		
potato	s	papa		
property	s	propiedad		
radio	s	radio		
radius	s	radio (de una circunferencia)		
roof	s	techo		
sample	s	muestra		
score	s	puntaje	v	tener puntaje
screen	s	pantalla		
sheet	s	hoja, lámina, chapa		
step	s	paso	step by step = paso a paso	
switch	s	interruptor (llave)		
symbol	s	símbolo		
tooth	s	diente		
value	s	valor		
vocabulary	s	vocabulario		
woman	s	mujer		

EJERCICIO 3.1

ADJETIVOS

Vuelva a escribir las frases dadas utilizando el antónimo correspondiente a cada adjetivo y traduzca

1) a long axis ……..

…….. ……..

2) the good samples ……..

…….. ……..

3) a fast change ……..

…….. ……..

4) the new law ……..

…….. ……..

5) a light leaf ……..

…….. ……..

6) the tall men ……..

…….. ……..

7) an easy theory ……..

…….. ……..

8) the large screens ……..

…….. ……..

9) a wide box ……..

…….. ……..

10) the high score ……..

…….. ……..

11) the <u>important</u> criteria ……..

…….. ……..

12) a <u>useful</u> result ……..

…….. ……..

13) the <u>thick</u> leaves ……..

…….. ……..

14) the <u>first</u> effect ……..

…….. ……..

GLOSARIO DEL EJERCICIO 2.1

Palabra	Función	Significado	Otra función y significado	
a	art	un, una		
condition	s	condición		
echo	s	eco	v	producir eco
effect	s	efecto		
energy	s	energía		
engineer	s	ingeniero		
future	s	futuro		
increase	s	aumento	v	aumentar
result	s	resultado	v	resultar
the	art	el, la, los, las		
time	s	tiempo, hora, vez, momento		
way	s	modo, manera, vía, camino		

GLOSARIO DEL EJERCICIO 2.2

Palabra	Función	Significado	Otra función y significado	
advance	s	adelanto, anticipación	v	adelantar
buzz	s	zumbido, chicharra		
hero	s	héroe		

GLOSARIO DEL EJERCICIO 3.1

Palabra	Función	Significado	Otra función y significado	
bad	adj	malo		
difficult	adj	difícil		
early	adj	temprano, primitivo, primeros		
easy	adj	fácil		
expensive	adj	caro		
fast	adj	rápido		
first	adj	primero		
good	adj	bueno		
heavy	adj	pesado		
high	adj	alto		
important	adj	importante		
large	adj	grande		
last	adj	último		
late	adj	tarde		
light	adj	liviano	s	luz
long	adj	largo		
low	adj	bajo		
narrow	adj	angosto		
new	adj	nuevo		
old	adj	viejo		
short	adj	corto, bajo		
slow	adj	lento		
small	adj	pequeño		
tall	adj	alto		
thick	adj	grueso, espeso		
thin	adj	delgado		
unimportant	adj	no importante, sin importancia		
useful	adj	útil		

EJERCICIO 4.1
COMBINACIONES DE SUSTANTIVOS

Traduzca las siguientes combinaciones de sustantivos

1) energy *conversion* …….

2) pollution *control* ……

3) air *pollution* ……

4) water *power* ……..

5) power *sources* ……

6) steam *engines* ……

7) key *difference* ……

8) growth *patterns* ……

9) population *growth* ……

10) food *consumption* ……

11) transportation *industry* ……..

12) uranium *fuels* ……

13) fuel *supplies* ……

14) data *processing* ……..

15) petroleum *resources* ……

16) irrigation *purposes* ……

17) gas *turbine* ……

18) jet *planes* ……

19) energy *input* ……

20) oil *wells* ……

EJERCICIO 4.2

Traduzca las siguientes combinaciones de sustantivos con dos o más sustantivos y/o adjetivos

1) pollution control *engineers* ……

2) energy conversion *devices* ……

3) electrical power *generation* ……

4) fossil-fuel-fired steam *engines* ……

5) radio and television *broadcasting* ……

6) world average per capita energy *consumption* ……

7) different energy use *sectors* ……

8) electrical generation and transportation *areas* ……

9) rotating-anode X-ray *tube* ……

10) English-speaking *country* ……

11) tool-and-die *maker* ……

12) long- and short-term *effects* ……

13) two-pole *switch* ……

14) 2-inch-diameter *pipes* ……

15) coaxial-cable-pair carrier *system* ……

16) permanent-magnet moving-iron *instrument* ……

17) short-circuit feedback *admittance* ……

18) step-by-step *instructions* ……

19) signal-distortion test *set* ……

20) simple, low-current *purposes* ……

GLOSARIO DEL EJERCICIO 4.1

Palabra	Función	Significado	Otra función y significado	
air	s	aire		
consumption	s	consumo		
control	s	control		
conversion	s	conversión		
difference	s	diferencia		
engine	s	motor, máquina		
food	s	comida, alimento		
fuel	s	combustible		
gas	s	gas (a veces gasolina)		
growth	s	crecimiento		
industry	s	industria		
input	s	entrada		
instrument	s	instrumento		
irrigation	s	irrigación		
jet	s	chorro		
oil	s	petróleo, aceite		
pattern	s	patrón, modelo		
petroleum	s	petróleo		
plane	s	plano, avión (airplane)		
pollution	s	polución		
population	s	población		
power	s	energía, potencia, poder		
processing	s	procesamiento		
purpose	s	propósito, aplicación		
resource	s	recurso		
source	s	fuente		
steam	s	vapor (de agua)		
supply	s	suministro, fuente		
transportation	s	transporte		
turbine	s	turbina		
uranium	s	uranio		
water	s	agua		
well	s	pozo	adv	bien

GLOSARIO DEL EJERCICIO 4.2

Palabra	Función	Significado	Otra función y significado	
admittance	s	admitancia		
and	conj	y		
anode	s	ánodo		
area	s	área		
average	s	promedio		
broadcasting	s	transmisión		
cable	s	cable		
capita	s	cápita, cabeza		
carrier	s	portador/a		
circuit	s	circuito		
coaxial	adj	coaxil		
country	s	país, campo		
current	s	corriente		
device	s	aparato, dispositivo, artefacto		
diameter	s	diámetro		
die	s	matriz	v	morir
distortion	s	distorsión		
electrical	adj	eléctrico		
English	s	inglés	adj	inglés
feedback	s	realimentación		
fire	v	alimentar, disparar	s	fuego
fossil	s	fósil	adj	fósil
generation	s	generación		
inch	s	pulgada		
instruction	s	instrucción		
iron	s	hierro		
magnet	s	imán		
maker	s	fabricante		
moving	adj	móvil		
pair	s	par		
per	prep	por		
permanent	adj	permanente		
pipe	s	caño		
pole	s	polo, poste		
ray	s	rayo		
rotating	adj	rotativo		
sector	s	sector		
set	s	juego, equipo, aparato, conjunto	v	colocar, fijar
signal	s	señal		
simple	adj	simple		
speaking	s	habla		
system	s	sistema		
television	s	televisión		
term	s	término, plazo		
test	s	ensayo, prueba	v	ensayar, probar
tool	s	herramienta		
tube	s	tubo		
two	num	dos		
use	s	uso		
world	s	mundo		

EJERCICIO 5.1

VERBO "SER o ESTAR" (Presente)

Complete los espacios en blanco con "am", "are" o "is" según corresponda y traduzca las oraciones.

1) Canada and Australia _____ English-speaking countries.

……

2) The young woman _____ tall.

……

3) The first sample _____ good.

……

4) John and William _____ electrical engineers.

……

5) The 1-inch-diameter pipes _____ long.

……

6) The world average per capita energy consumption _____ not high.

……

7) An energy conversion device _____ useful.

……

8) _____ gas turbines expensive?

……

9) Tom and I _____ tool-and-die makers.

……

10) The population growth _____ important.

……

GLOSARIO DEL EJERCICIO 5.1

Palabra	Función	Significado	Otra función y significado
am	v	soy, estoy	
are	v	eres, sos, son, estás, están	
is	v	es, está	

EJERCICIO 5.2

Vuelva a escribir las oraciones del Ejercicio 5.1 pero sustituyendo cada sujeto por el correspondiente pronombre personal

1) ……..

……

2) ……..

……

3) ……..

……

4) ……..

……

5) ……..

……

6) ……..

……

7) ……..

……

8) ……..

……

9) ……..

……

10) ……..

……

REPASO 1

Traduzca las siguientes oraciones

1) It is a good two-pole switch.

……

2) They are fast jet planes.

……

3) He is an important man.

……

4) They are not simple growth patterns.

……

5) Are they the first fuel supplies?

……

6) A steam engine is a useful device.

……

7) It is not a narrow screen.

……

8) They are short and thin women.

……

9) You are not an average engineer.

……

10) Is it an old energy resource?

……

REPASO 2

Traduzca las siguientes combinaciones de sustantivos

1)	steam engine	engine steam
	……..	……..
2)	power source	source power
	……..	……..
3)	data processing control	control data processing
	……..	……..
4)	irrigation-water supply	irrigation-supply water
	……..	……..
5)	gas-turbine jet system	jet-turbine-gas system
	……..	……..
6)	television signal input	television input signal
	……..	……..
7)	transportation-fuel purposes	transportation-purpose fuels
	……..	……..

REPASO 3

Traduzca las siguientes frases extraídas de una tabla de contenidos

EJERCICIO 6.1

VERBO "SER o ESTAR" (Pasado)

Complete los espacios en blanco con "was" o "were" según corresponda y traduzca las oraciones

1) It _____ a new permanent magnet.

……

2) They _____ heavy turbines.

……

3) The signal input _____low.

……

4) It _____not a rotating device.

……

5) _____ the oil industry important?

……

EJERCICIO 7.1

TIEMPO PRESENTE SIMPLE

Complete los espacios con el Tiempo Presente de los verbos dados entre paréntesis y traduzca.

1) Energy _____ living conditions more comfortable. (make)

……

2) They _____ a different power source. (use)

……

3) In chapter four we _____ the oil resources of the country. (discuss)

……

4) The efficiency of the system _____ with a good design. (increase)

……

5) It _____ an important television industry. (have)

……

6) X-rays _____ the test time. (reduce)

……

7) She often _____ at the control instruments. (look)

……

8) I _____ several light tools. (need)

……

9) The distortion _____ at a constant rate. (change)

……

10) An electrical engineer _____ many useful properties. (know)

……

EJERCICIO 7.2

Subraye la forma correcta de las dos dadas entre paréntesis y traduzca las siguientes oraciones

1) (Do/Does) engineers need steam engines?

……

2) The efficiency of the turbine (do/does) not change.

……

3) The rotating devices (do/does) not have a different power source.

……

4) (Do/Does) the input signal increase at a constant rate?

……

5) (Do/Does) good control instruments reduce the test time?

……

6) Richard and I (do/does) not know the average energy consumption.

……

7) Japan (do/does) not make thin 1-inch diameter pipes.

……

8) (Do/Does) the feedback increase the distortion?

……

9) Several students (do/does) not use the important data.

……

10) (Do/Does) the country need new oil resources?

……

GLOSARIO DEL EJERCICIO 6.1

Palabra	Función	Significado	Otra función y significado
was	v	pretérito del verbo to be	
were	v	pretérito del verbo to be	

GLOSARIO DEL EJERCICIO 7.1

Palabra	Función	Significado	Otra función y significado	
at	prep	en, a		
change	v	cambiar, variar	s	cambio
chapter	s	capítulo		
comfortable	adj	confortable		
constant	adj	constante	s	constante
design	s	diseño	v	diseñar
different	adj	diferente		
discuss	v	discutir, tratar		
efficiency	s	eficiencia, rendimiento		
have	v	tener (irreg. had, had)		
know	v	saber, conocer (irreg. knew, known)		
living	s	vida		
look	v	mirar	s	apariencia
make	v	hacer (irreg. made, made)		
many	adj	muchos		
more	adj	más	adv	más
need	v	necesitar	s	necesidad
of	prep	de		
often	adv	a menudo		
rate	s	velocidad, ritmo, tarifa, índice	v	clasificar, tasar
reduce	v	reducir		
several	adv	varios		
with	prep	con		

EJERCICIO 8.1

TIEMPO PASADO SIMPLE

Complete con el Tiempo Pretérito (indefinido o imperfecto) de los verbos dados entre paréntesis

Verbos regulares

1) We _____ an increase in the production of cars. (expect)

……

2) The efficiency _____ close to 100% yesterday. (remain)

……

3) They _____ the reserves into 3 main groups. (divide)

……

4) It _____ the available supply of solar energy. (include)

……

5) The last theory _____ the first law of thermodynamics. (consider)

……

Verbos irregulares

6) We _____ a different coaxial cable. (see)

……

7) The first chapter _____ with “Signal Feedback”. (begin)

……

8) He _____ a slow water turbine. (choose)

……

9) I _____ a new television set last week. (bring)

……

10) The students_____ to the university by bus. (go)

……

GLOSARIO DEL EJERCICIO 8.1

Palabra	Función	Significado	Otra función y significado
available	adj	disponible	
begin	v	empezar (irreg. began, begun)	
bring	v	traer (irreg. brought, brought)	
bus	s	ómnibus	
by	prep	por	(by bus = en ómnibus)
car	s	auto	
choose	v	elegir (irreg. chose, chosen)	
close	adj	cercano (close to =cercano a)	v cerrar
consider	v	considerar	
divide	v	dividir	
expect	v	esperar	
go	v	ir (irreg. went, gone)	
group	s	grupo	
in	prep	en	
include	v	incluir	
into	prep	en, dentro de	
main	adj	principal	
production	v	producción	
remain	v	permanecer	
reserve	s	reserva	v reservar
see	v	ver (irreg. saw, seen)	
solar	adj	solar	
thermodynamics	s	termodinámica	
to	prep	a, hacia	
university	s	universidad	
week	s	semana	
yesterday	adv	ayer	

REPASO 4

Traduzca las siguientes oraciones

1) The last chapter did not include the first law.

……

2) It had a different growth pattern.

……

3) Does the book begin with data processing?

……

4) It did have an important property.

……

5) Did you see the first carrier pattern?

……

6) We knew the rate change of the admittance.

……

7) They made large jet engines.

……

8) The students do not bring more wide and thick anodes.

……

9) The energy supply did not remain constant.

……

10) Did he expect a different buzz?

……

EJERCICIO 9.1

TIEMPO FUTURO SIMPLE

Complete con el Tiempo Futuro Simple de los verbos dados entre paréntesis y traduzca

1) We _____ the process tomorrow. (study)

……

2) The fabrication _____ on the mechanical properties of the materials. (depend)

……

3) You _____ vast environmental conditions. (find)

……

4) It _____ an ideal situation. (be)

……

5) I _____ the final gas pressure. (measure)

……

6) He _____ several boxes in the laboratory. (leave)

……

7) Charles and Jane _____ the first plane to New York. (take)

……

8) They _____ all the new words on a paper. (write)

……

9) We _____ to the selection of materials later. (return)

……

10) The water temperature _____ between 15 and 20 degrees. (range)

……

EJERCICIO 9.2
Traduzca las siguientes oraciones

1) The jet engine production will not decrease.

……

2) Will you choose a university in advance?

……

3) The sample will begin with a minimum value.

……

4) We shall not consider the first results.

……

5) Will men use the available fossil-fuel-fired steam engine?

……

6) It does not include simple, low current purposes.

……

7) They will not discuss the long- and short-term effects.

……

8) I did not look at the step-by-step instructions.

……

9) Will he change the permanent-magnet moving-iron instrument?

……

10) Do you know a good tool-and-die maker?

……

GLOSARIO DEL EJERCICIO 9.1

Palabra	Función	Significado	Otra función y significado	
all	adj	todo		
between	prep	entre		
degree	s	grado		
depend	v	depender (depend on/upon= depender de)		
environmental	adj	ambiental		
fabrication	s	fabricación		
final	adj	final		
find	v	encontrar (irreg. found, found)		
ideal	adj	ideal		
laboratory	s	laboratorio		
later	comp	más tarde, después		
leave	v	salir, dejar (irreg. left, left)		
material	s	material		
measure	v	medir		
mechanical	adj	mecánico		
on	prep	sobre, en		
paper	s	papel		
pressure	s	presión		
process	s	proceso		
range	v	oscilar, variar		
return	v	volver	s	retorno
selection	s	selección		
situation	s	situación		
study	v	estudiar	s	estudio
take	v	tomar, llevar (irreg. took, taken)		
temperature	s	temperatura		
tomorrow	adv	mañana	s	mañana
vast	adj	vasto		
word	s	palabra		
write	v	escribir (irreg. wrote, written)		

EJERCICIO 10.1

VERBOS MODALES “CAN, MAY, MUST”

Traduzca las siguientes oraciones

1) He *must* design devices and structures.

……

2) It *may* support the loads that you apply.

……

3) Stainless steel *can* meet the design specifications.

……

4) You *can* make a final choice of materials.

……

5) The structure *must* fulfill two main requirements.

……

6) He *may* come to the university tomorrow.

……

7) They *must* be the first samples.

……

8) The world population *may* have a fast increase in the future.

……

9) She *can* design long pipe systems.

……

10) We *may* study the process pattern.

……

GLOSARIO DEL EJERCICIO 10.1

Palabra	Función	Significado	Otra función y significado	
apply	v	aplicar		
can	v. modal	poder		
choice	s	eleccción		
fulfill	v	cumplir, llenar		
load	s	carga	v	cargar
may	v. modal	puede que		
meet	v	reunir, encontrar, satisfacer (irreg. met, met)		
must	v. modal	deber		
requirement	s	requisito		
specification	s	especificación		
steel	s	acero (stainless steel = acero inoxidable)		
structure	s	estructura		
support	v	soportar	s	soporte
that	pron. Relat.	que	adj	ese/a, aquel/la

EJERCICIO 10.2
Traduzca las siguientes oraciones

1) Can they study the vast environment conditions of the country?

……

2) It may not be the ideal situation.

……

3) Must it depend on the properties of the materials?

……

4) He cannot take the first bus.

……

5) May I write the new words on a sheet of paper?

……

6) You must not return to the laboratory.

……

7) Can she measure the final gas pressure?

……

8) May the temperature range between 30 and 35 degrees tomorrow?

……

9) I cannot find the main design specifications.

……

10) The new students must not remain in the laboratory.

……

REPASO 5

Traduzca las siguientes oraciones

1) Is the car industry important?

……

2) It’s an old rotating device.

……

3) The signal output must not be high.

……

4) They’re old steam turbines.

……

5) It isn’t a good permanent magnet.

……

6) He knew many useless circuit theories.

……

7) The buzz changed at a constant rate.

……

8) You can’t include the first law of thermodynamics.

……

9) He divides the class into two groups.

……

10) The students may not bring food.

……

11) Did you choose a different carrier?

……

12) They made several power sources last week.

……

13) He often goes to the country.

……

14) The living conditions were not good.

……

15) It didn’t need a new design.

……

16) I was not at the control instruments.

……

17) Does he expect a slow production growth?

……

18) We found the ideal mechanical properties.

……

19) A tall man measured the steam temperature.

……

20) He must not remain close to the laboratory window.

……

21) We shall not design large and heavy structures.

……

22) She won’t come to class tomorrow.

……

23) They left New York at 5.00 yesterday.

……

24) You cannot depend on the process selection.

……

25) Did the X-ray tests begin?

……

EJERCICIO 11.1

Extract from The Ruby on Rails Tutorials

1.1.2 Conventions in this book

The conventions in this book are mostly self-explanatory. In this section, I'll mention some that may not be.

Many examples in this book use command-line commands. For simplicity, all command line examples use a Unix-style command line prompt (a dollar sign), as follows

```
$ echo "hello, world"
hello, world
```

I recommend that users of all operating systems (especially Windows) use a cloud development environment. This is particularly useful because Rails comes with commands which run at the command line. For example, in Section 1.3.2 we'll run a local development web server with the **rails server** command

```
$ rails server
```

As with the command-line prompt, the *Rails Tutorial* uses the Unix convention for directory separators (i.e., a forward slash /). For example, the sample application **production.rb** configuration file appears as follows:

```
config/ environments/ productions.rb
```

GLOSARIO DEL EJERCICIO 11.1 (Extract from The Ruby on Rails Tutorials)

Palabra	Función	Significado	Otra función y significado
all	adj	todos/as	
appear	v	aparecer	
as	adv	como	
at	prep	en	
because	conj	porque	
built-in	adj	integrado/a	
cloud	s	nube	
command	s	comando	
convention	s	convención, uso	
development	s	desarrollo	
directory	s	directorio	
dollar	s	dólar	
echo	s	eco, repetición	
environment	s	medio, medioambiente	
especially	adv	especialmente	
example	s	ejemplo	
file	s	archivo	
follow	v	seguir	
for	prep	para	
forward	adj	inclinada, hacia adelante	
i.e.	adv	es decir (Latin, abrev = id est = that is)	
line	s	línea	
many	adj	muchos/as	
mention	v	mencionar	
mostly	adv	principalmente	
of	prep	de	
operating	adj	operativo	
prompt	s.	caracter/es que se muestran en una línea de comandos para indicar que está a la espera de órdenes).	
recommend	v	recomendar	
run	v	correr, ejecutar, operar	
section	s	sección	
self-explanatory	adj	auto-explicativo	
separator	s	separador	
server	s	servidor	
sign	s	signo	
simplicity	s	simplicidad	
slash	s	barra	
some	adj	algunos/as	
style	s	estilo	
system	s	sistema	
that	conj	que	
this	adj	este/esta	
useful	adj	útil	
user	s	usuario	
which	pron	que, el cual/la cual	
with	prep	con	

EJERCICIO 12.1
VOZ PASIVA

Lea el siguiente texto.

Energy Resources and Uses

The development of society can be characterized by a progressive substitution of machine power for muscle power.

The first attempt to use a power source occurred in the first century B.C. when water power was used for irrigation purposes. Even today, water is an important source of power, especially in mountainous terrain where electricity is generated in hydroelectric power stations.

During the Industrial Revolution the emphasis on energy resources was shifted from water power to fossil fuels. Water power was restricted to a few geographical areas but fossil-fuel-fired steam engines were mobile power sources.

The steam engine was first used as an auxiliary waterwheel pump and by the middle of the 19th century the steam engine became the principal power source for the manufacturing industry of the world.

The interest in energy consumption, energy reserves, and the ability to deliver energy where it is desired can be tied to industrialization. Thus, the great demands that are placed on the energy reserves of the earth can be explained by the fact that almost every country tries to industrialize – and industrialization takes energy.

For example, in the United States, the annual per capita energy consumption is approximately equal to the energy that can be obtained from 10 tons of coal.

GLOSARIO DEL EJERCICIO 12.1

Palabra	Función	Significado	Otra función y significado
ability	s	habilidad, capacidad	
almost	adv	casi	
annual	adj	anual	
approximately	adv	aproximadamente	
as	conj	como	adv a medida que
attempt	s	intento	
auxiliary	adj	auxiliar	
B.C	abr	antes de Cristo (Before Christ)	
become	v	hacerse, volverse, convertirse (irreg. became, become)	

but	conj	pero, sino	prep	excepto
century	s	siglo		
characterize	v	caracterizar		
coal	s	carbon (mineral)		
deliver	v	entregar		
demand	s	demanda	v	demandar, exigir
desire	v	desear	s	deseo
development	s	desarrollo		
during	prep	durante		
earth	s	tierra		
electricity	s	electricidad		
emphasis	s	énfasis		
equal	adj	igual		
especially	adv	especialmente		
even	adv	incluso, aún	adj	parejo, par
every	adj	cada, todo		
example	s	ejemplo		
explain	v	explicar		
fact	s	hecho		
few	adj	pocos (a few = unos pocos)		
for	prep	para		
from	prep	de, desde		
generate	v	generar		
geographical	adj	geográfico		
great	adj	gran, grande		
hydroelectric	adj	hidroeléctrico		
industrial	adj	industrial		
industrialization	s	industrialización		
industrialize	v	industrializar		
interest	s	interés		
manufacturing	adj	manufacturero		
middle	s	mitad	adj	medio, central
mobile	adj	móvil		
mountainous	adj	montañoso		
muscle	s	músculo *muscle power: tracción a sangre*		
obtain	v	obtener		
occur	v	ocurrir, producir/se		
place	v	colocar	s	lugar
power	s	energía		
progressive	adj	progresivo		
pump	s	bomba	v	bombear
restrict	v	restringir		
revolution	s	revolución		
shift	v	cambiar, conmutar	s	cambio, turno
society	s	sociedad		
station	s	estación (power station = estación eléctrica)		
substitution	s	sustitución		
terrain	s	terreno		
thus	adv	así		
tie	v	atar, ligar, relarcionar		
today	adv	hoy		
ton	s	tonelada		
try	v	probar, intentar		
water	s	agua	adj.	hidráulico
waterwheel	s	rueda hidráulica		
where	adv	donde, adonde		

EJERCICIO 12.2

Complete el siguiente cuadro de acuerdo con la secuencia de los eventos expuestos en el texto anterior (utilice una o 2 palabras en inglés).

Century	***Power Sources***	***Uses***
Before 1st B.C.		
1st B.C.		
19th A.D		

EJERCICIO 12.3

En la tabla siguiente se enuncian algunas causas o efectos mencionados en el texto del Ejercicio 12.1. Complete en forma resumida con las causas o efectos correspondientes de acuerdo al texto.

Causes	***Results***
Development of a society	
Fossil-fuel-fired-engines	
Water power was restricted to a few geographical areas	
	Interest in energy consumption, energy reserves, etc.
	Great demands are placed on energy reserves.

EJERCICIO 12.4

Subraye las formas en VOZ PASIVA en el Ejercicio 12.1 y traduzca

EJERCICIO 12.5

Lea el siguiente texto.

Tension Test

In the tension test a specimen is subjected to increasing elongation until it fractures. The tensile load and elongation are measured at frequent intervals and the results are expressed in terms of stress and strain that are independent of the specimen size.

The normal stress is defined as the ratio of the load on the sample to the original cross-sectional area.

The average linear strain is defined as the ratio of the change in length of the sample to the original length.

Typical tensile stress-strain curves are shown in figure 6.2

In the early stages of the tensile test the sample extends elastically, that is, the sample will return to the original length if the load is released. In the elastic region, stress is proportional to strain and is described by Hooke's law. The elastic modulus E defined by Hooke's law is very important in certain designs where the deformation must be kept to a minimum.

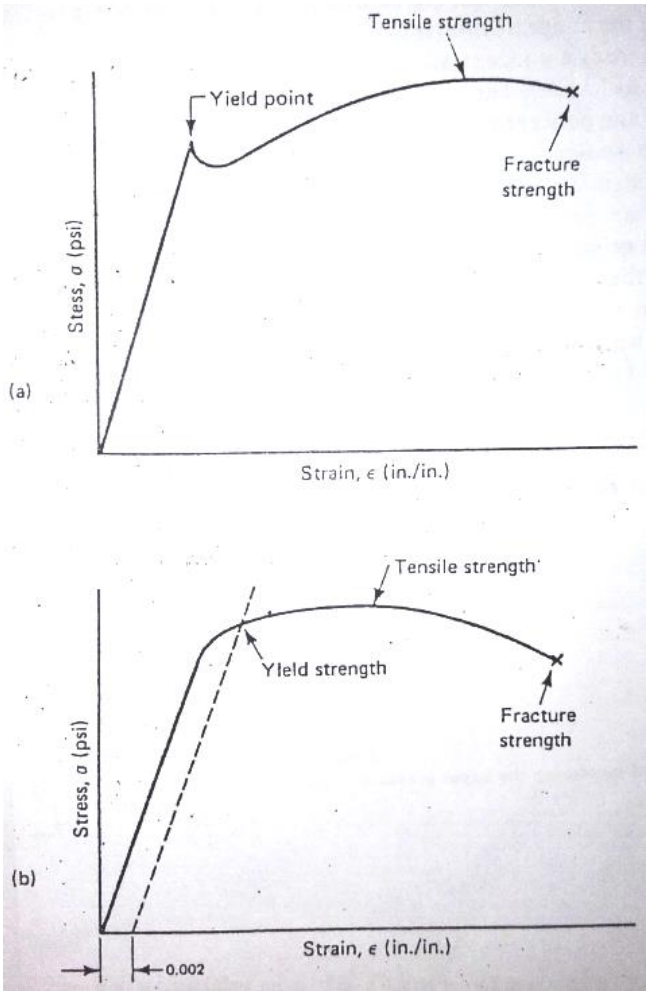


Figure 6.2
Typical tensile stress-strain curves.
(a) Low carbon steel. (b) Nonferrous metal.

GLOSARIO DEL EJERCICIO 12.5

Palabra	Función	Significado	Otra función y significado	
cross-sectional	adj	transversal		
curve	s	curva		
define	v	definir		
deformation	s	deformación		
elastically	adv	elásticamente		
elongation	s	alargamiento		
express	v	expresar		
figure	s	figura, cifra	v	figurar, imaginar
fracture	v	fracturar*(se)*		
frequent	adj	frecuente		
independent	adj	independiente		
interval	s	intervalo		
keep	v	mantener, conserver (irreg. kept, kept)		
length	s	longitud		
linear	adj	lineal		
modulus	s	módulo		
normal	adj	normal		
original	adj	original		
proportional	adj	proporcional		
ratio	s	cociente, relación		
region	s	región		
release	v	liberar		
show	v	mostrar (irreg. showed, shown)	s	espectáculo
size	s	tamaño, talle		
specimen	s	espécimen, probeta		
stage	s	etapa		
strain	s	deformación	v	estirar, tensar
stress	s	esfuerzo, tensión	v	someter a esfuerzo
subject	v	someter	s	sujeto, tema, materia
tensile	s	tracción, tensión		
that is	expr	es decir		
typical	adj	típico		
until	conj	hasta	prep	hasta
very	adv	muy		
wire	s	cable, alambre		

EJERCICIO 12.6
Según el texto anterior resuelva los siguientes problemas

a) Find the normal stress produced by a load of 500 kg on a 5-mm-diameter wire.

b) A specimen had an original length of 300 mm. What is the average linear strain if it is 302 mm long when it is subjected to a 3000-kg load?

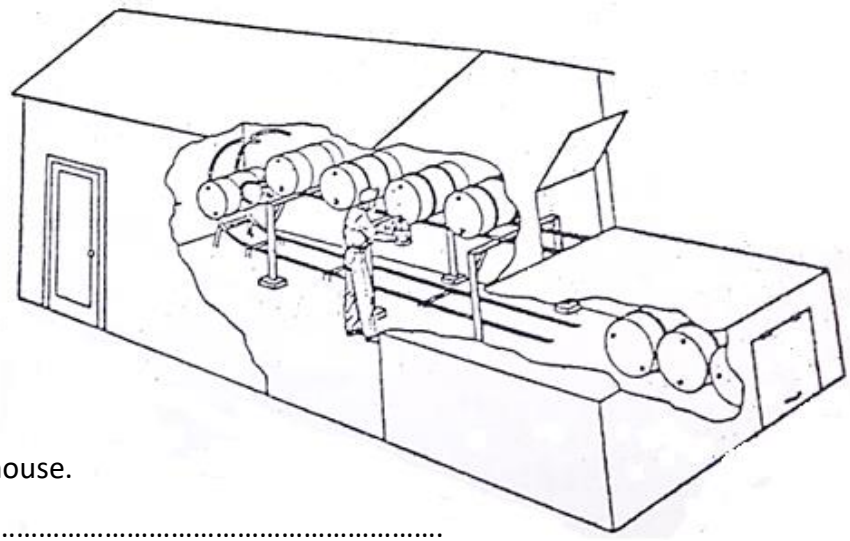
EJERCICIO 12.7
Copie las formas en Voz Pasiva que encuentre en el Ejercicio 12.5 y escriba su equivalente en castellano utilizando la forma "se…"

1) is subjected = se somete
2) …….. = ……..
3) …….. = ……..
4) …….. = ……..
5) …….. = ……..
6) …….. = ……..
7) …….. = ……..
8) …….. = ……..
9) …….. = ……..

EJERCICIO 13.1

PREPOSICIONES DE LUGAR

Subraye la preposición correcta de acuerdo con el dibujo y traduzca las oraciones.



1) The man is (*in, on, behind)* the house.

……

2) 4 drums are placed (*in front of, above, below*) the man.

……

3) The man is not (*in, on, at*) the door.

……

4) The roof is (*over, below, by*) the man.

……

5) I can see 3 drums (*over, on, above*) the floor and (*by, under, in*) a low door.

……

6) The main door is (*behind, against, beside*) the man.

……

7) He is standing (*by, on, over*) 3 drums that are (*over, above, on*) the upper rails.

……

8) The picture does not show the sky or clouds (*on, above, over*) the house.

……

9) The figure (*above, below, over*) was not colored.

……

10) Drums roll (*of, from, under*) the upper (*to, at, in*) the lower rails.

……

GLOSARIO DEL EJERCICIO 13.1

Palabra	Función	Significado	Otra función y significado
above	prep	(por) encima de	
against	prep	contra	
at	prep	en	
behind	prep	detrás de	
below	prep	(por) debajo de	
beside	prep	al lado de, junto a	
between	prep	entre	
by	prep	al lado de, junto a	
cloud	s	nube	
color	v	colorear	s color
door	s	puerta	
drum	s	tambor	
floor	s	piso	
from	prep	desde, de (origen)	
house	s	casa	
in	prep	dentreo (de)	
in front of	prep	delante de, en frente de	
into	prep	dentro de	
inside	prep	dentro de	
lower	adj	inferior	
near	prep	cerca (de)	
next to	prep	al lado de, junto a	
on	prep.	sobre (hace contacto con la superficie)	
over	prep	sobre (no hace contacto con la superficie)	
picture	s	figura, cuadro, película	
rail	s	riel	
roll	v	rodar	
sky	s	cielo	
to	prep	a, hacia	
under	prep	bajo, debajo de	
upper	adj	superior	

GLOSARIO DEL EJERCICIO 14.2

Palabra	Función	Significado	Otra función y significado
amount	s	cantidad	v valer
physics	s	física	
require	v	requerir	

EJERCICIO 14.1

Complete los espacios con el Presente Progresivo de los verbos dados entre paréntesis

1) They _____ the tensile load and the elongation. (measure)

……

2) He _____ a very important law. (define)

……

3) _____ you _____ the deformation to a minimum? (keep, interrog.)

……

4) The sample _____ elastically during the last stage of the test. (extend, neg)

……

5) The strain _____ independent of specimen size. (be)

……

EJERCICIO 14.2

Complete los espacios con el Pasado Progresivo de los verbos dados entre paréntesis.

1) They _____ an equal amount of energy from coal. (obtain)

……

2) I _____ a new pump. (use, neg.)

……

3) The development of society _____ more fuel reserves. (require)

……

4) _____ you _____ the change in length? (consider, interr.)

……

5) She _____ physics at the university. (study)

……

CASOS DE –ING

Cuando en inglés se usa una formas con –ing	***Ejemplos***	***En castellano debe interpretarse como***
CASO 1: Con un TIEMPO PROGRESIVO	John is *loading* the printer. John was *loading* the printer.	***El correspondiente tiempo progresivo:*** John está *cargando la impresora.* John estaba *cargando la impresora.*
CASO 2: Después de una PREPOSICIÓN (excepto ON, IN, o de las conjunciones WHEN o WHILE)	We checked the meter <u>before</u> *starting* the test. They use steam <u>for</u> *moving* the turbine. We solved a problem <u>without</u> *reading* the previous theory.	**El INFINITIVO** Chequeamos el medidor <u>antes de</u> *comenzar* la prueba. Ellos usan vapor <u>para</u> *mover* la turbina. Solucionamos un problema <u>sin</u> *leer* la teoría previa.
CASO 3: Después de las preposiciones ON/UPON, IN o de las conjunciones WHEN o WHILE.	<u>On</u> *arriving* we found that it was different. <u>In</u> *experimenting* with light bulbs Edison discovered the thermionic effect. <u>When</u> *experimenting* with light bulbs…	***AL + INFINITIVO*** <u>Al</u> *llegar* encontramos que era diferente. <u>Al</u> *experimentar* con bombillas de luz Edison descubrió el efecto termiónico. <u>Al</u> *experimentar* con bombillas de luz…
CASO 4: Después de la preposición BY	We solved the problem <u>by</u> *using* logarithms. You can see the sign <u>by</u> *lifting* the cover. He will pass the exam <u>by</u> *studying* hard.	***El PARTICIPIO PRESENTE*** (-ando/ -endo) omitiendol a preposición. Implica por *"medio de*". Solucionamos el problema *usando* logaritmos. Podes ver el símbolo *levantando* la cubierta. El aprobará el examen *estudiando* duro.
CASO 5: Al actuar dicha forma como VERBO y SUSTANTIVO al mismo tiempo	*Smoking* is bad for you. One of my problems is *writing* letters. *Seeing* is *believing*	El INFINITIVO (o con el artículo "EL" + el INFINITIVO) (El) *fumar* es malo para vos. Uno de mis problemas es (el) *escribir* cartas. *Ver* es *creer. (o Ver para creer)*

CASO 6: Una PROPOSICIÓN ADJETIVA que ha sido reducida a una FRASE ADJETIVA. Se la reconoce porque la forma –*ing* le sigue inmediatamente al sustantivo que modifica. *<u>Proposición</u>: conjunto de palabras relacionadas que tienen sujeto y verbo.* *<u>Frase</u>: conjunto de palabras relacionadas que no tienen sujeto y verbo.*	The cable *connecting* the amplifier is new (= The cable *<u>that connects</u>* the amplifier…) We proposed a plan *containing* 2 choices. (= We proposed a plan *<u>that contained</u>* …) Materials *having* a high conductivity are very expensive (= Materials *<u>that have</u>* a high…)	Sustantivo + [QUE] + [VERBO CONJUGADO] (en presente, pasado, etc.) según el tiempo implícito en la oración. El cable *que conecta* el amplificador es nuevo Propusimos un plan *que contenía* 2 opciones. Los materiales *que tienen* alta conductividad son caros.
CASO 7: Algunos verbos requieren requieren que le siga una forma –*ing*: FINISH, STOP, QUIT, DELAY, AVOID, INVOLVE, KEEP, ENJOY, MIND, CONSIDER, DISCUSS, Otros verbos que pueden ser seguidos un –ing : BEGIN, START, LIKE, PREFER, TRY, NEGLECT, CONTINUE, REMEMBER, etc	It <u>stopped</u> *raining.* We tried to <u>avoid</u> *increasing* the cost. It <u>began</u> *raining.* = It began to *rain.* He <u>likes</u> *studying* there. = He likes *to study* there.	El INFINITIVO (a veces precedido por la preposición *de, a, en, etc.)* <u>Paró</u> de *llover.* Intentamos <u>evitar</u> *aumentar el costo.* <u>Comenzó</u> a *llover.* Le <u>gusta</u> *estudiar* allí.
CASO 8: Como SUSTANTIVO	The *heating* of an alloy must be slow. We used arc *welding* to repair the pump. The instructions for correct paper *loading* are necessary.	El SUSTANTIVO El *calentamiento* de una aleación debe ser lento. Usamos *soldadura* de arco para reparar la bomba. Las instrucciones para la *carga* correcta del papel son necesarias.
CASO 9: Como ADJETIVO	The *resulting* vapors are not harmful. Some *escaping* electrons are attracted by the nearby atoms. They can measure the *moving* charges with a galvanometer.	El ADJETIVO (si existe), o en su defecto una proposición adjetiva. Algunos casos debe considerarse como una combinación sustantivo + sustantivo. Los vapores *resultantes* no son dañinos. Algunos electrones *que se escapan* son atraídos por los átomos cercanos. Pueden medir las cargas *móviles* con un galvanómetro.

EJERCICIO 15.1

Complete los espacios con la forma –ing de los verbos dados entre paréntesis y traduzca. Indique la función que cumple en cada uno de los ejemplos

1) Laws _____ the behavior of electric charges will be developed. (govern)

……

……

2) They must have a basic _____ of electric instruments. (understand)

……

……

3) We shall consider the number of protons _____ to the right. (move)

……

……

4) It may be understood by _____ the concepts defined above. (use)

……

……

5) In _____ through the passive element, the current creates a voltage drop. (pass).

……

……

6) A few jet aircrafts can make vertical takeoffs and _____. (land)

……

……

7) A good utilization of _____ materials is very necessary. (exist)

……

……

8) The _____ need of metals for high-temperature service will require new alloys. (increase)

……

……

9) The problem of _____ the right material for a given application is sometimes of great complexity. (select)

……

……

10) In _____ the first law, the _____ convention is used for _____ the algebraic sign of the voltage. (apply: follow; determine)

……

……

11) The _____ temperature is well above 1,000° C. (operate)

……

……

12) It will be given before _____ the next section. (conclude)

……

13) It is obtained by the passage of a fine X-ray beam through a powder of iron _____ (file).

……

……

14) You must consider the _____ interest in home computers. (grow)

……

……

15) Numerical data _____ the thermal properties are obtained from the standard tests. (show)

……

EJERCICIO 15.2

Traduzca las oraciones y escriba a qué caso pertenecen las formas con ING subrayadas.

1) Steels show advantages as regards cost and recycling.

……

2) In choosing a site, landscape considerations must be discussed.

……..

3) Floating constructions must be employed at sea.

……

4) The topic of the conference is of increasing importance.

……

5) Those plants generate revenues exceeding one billion dollars.

……..

6) While buying a suitable turbine, he chose a strong housing.

……

7) He brought a few drawings showing the material creep.

……..

8) Hydropower is used almost exclusively for generating electricity in the country.

……

GLOSARIO DEL EJERCICIO 15.1

Palabra	Función	Significado	Otra función y significado	
aircraft	s	aeronave		
algebraic	adj	algebraico		
alloy	s	aleación		
application	s	aplicación, solicitud		
basic	adj	básico		
beam	s	haz, rayo		
before	prep	antes de, delante de		
behavior	s	comportamiento		
complexity	s	complejidad		
computer	s	computadora		
concept	s	concepto		
conclude	v	concluir		
convention	s	convención		
create	v	crear		
determine	v	determinar		
develop	v	desarrollar		
drop	s	caída, gota	v	dejar caer
element	s	elemento		
exist	v	existir		
fine	adj	fino		
follow	v	seguir		
give	v	dar (irreg. gave, given)		
grow	v	crecer (irreg. grew, grown)		
home	s	hogar, casa		
land	v	aterrizar	s	tierra, territorio
metal	s	metal		
move	v.	*mover(se)*		
necessary	adj	necesario		
next	adj	próximo, siguiente		
numerical	adj	numérico		
operate	v	operar, funcionar, hacer funcionar		
pass	s	pase	v	pasar
passage	s	pasaje		
passive	adj	pasivo		
powder	s	polvo		
problem	s	problema		
proton	s	protón		
right	s	derecha, derecho	adj	derecho, correcto
select	v	seleccionar		
service	s	servicio		
sign	s	signo, cartel	v	firmar
sometimes	adv	algunas veces		
standard	adj	normal, común	s	norma
takeoff	s	despegue (aviación)		
thermal	adj	térmico		
through	prep	a través de		
understand	v	entender		
utilization	s	utilización		
vertical	adj	vertical		
voltage	s	tensión (voltaje)		

Glosario EJERCICIO 15.2

Palabra	Función	Significado	Otra función y significado
advantage	s.	ventaja	
almost	adv.	casi	
as regards	frase adv.	con respecto a	
creep	s.	deformación por fluencia	
exceed	v.	exceder	
float	v.	flotar	
housing	s.	carcasa, cubierta	
hydropower	s.	energía hidráulica	
landscape	s.	paisaje	
recycle	v.	reciclar	
revenue	s.	ganancia	
suitable	adj.	apropiado/a/os/as	
topic	s.	tema	

FORMAS CON –ING vs. FORMAS –ED (como adjetivos)

Debe interpretarse bien la diferencia entre PARTICIPIOS PRESENTES y los PARTICIPIOS PASADOS usados como adjetivos. Los primeros califican con una expresión de una acción en desarrollo, mientras que los participios pasados lo hacen con acciones ya realizadas o completadas (generalmente pasivas, aunque no siempre).

Conjuntos con participios pasados	*Conjuntos con participios presentes*
the *escaped* gas *(= the gas that escaped)* el gas *escapado*	*is* the *escaping* gas *(= the gas that was escaping)* *will be* el gas (*que está/estaba/estará) escapando* el gas *que escapa/escapaba/escapará)*
is the *varied* content (*= the content that was varied)* *will be* el contenido *variado*	*is* the *varying* content (*= the content that was varying)* *will be* el contenido *variante*
is a *fascinated* person (*= a person that was fascinated)* *will be* una persona *fascinada*	a *fascinating* person (*= a person that fascinates)* una persona *fascinante*
is an *increased* value (*= a value that was increased)* *will be* un valor *aumentado*	*is* an *increasing* value (*= a value that was increasing)* *will be* un valor que *aumenta*

EJERCICIO 16.1
Traduzca las siguientes frases y compare

1) the expecting people	the expected people
……	……
2) the changing generation	the changed generation
……	……
3) the extending country	the extended country
……	……
4) the moving particles	the moved particles
……	……
5) this carrying device	this carried device
……	……
6) the determining function	the determined function
……	……
7) a controlling fact	a controlled fact
……	……
8) that landing plane	that landed plane
……	……
9) the measuring interval	the measured interval
……	……
10) those supporting structures	those supported structures
……	……

EJERCICIO 17.1

ADJETIVOS DEMOSTRATIVOS

Traduzca las siguientes oraciones.

1) It is beyond the scope of *this* section.

……

2) Small oxide particles are dispersed through *these* alloys.

……

3) Many people believe that *this* will be the material of the future.

……

4) *Those* concepts are explained in *this* book.

……

5) Does he understand *that* theory?

……

EJERCICIO 17.2

Subraye la forma correcta y traduzca cada oración

1) (*That/Those*) axis was drawn at 90 degrees.

……

2) Did (*that/those)* men bring (*this/these*) tools?

……

3) (*This/These*) is not the color that I chose.

……

4) (*That/Those*) microwave devices were made in Japan.

……

5) Things were not always (*this/these)* way.

……

EJERCICIO 17.3
Traduzca las siguientes oraciones

1) He selected these alloys but then he used *that one.*

……

2) You must put a + sign before this relationship and a – sign before *that one.*

……

3) Can't they see *that?*

……

4) *This* must be understood first.

……

5) *Those* were perfect landings but I prefer *this one.*

……

GLOSARIO DE LOS EJERCICIOS 17.1, 17.2 y 17.3

Palabra	Función	Significado	Otra función y significado	
beyond	prep	más allá (de)		
disperse	v	dispersar		
microwave	s	microonda		
oxide	s	óxido		
particle	s	particular		
people	s	gente, personas, pueblo		
perfect	adj	perfecto		
prefer	v	preferir		
relationship	s	relación		
scope	s	alcance		
that	adj dem	ese, esa, aquel, aquella	pron	eso, aquello
these	adj dem	estos, estas	pron	éstas, estos
this	adj dem	este, esta	pron	esto
those	adj dem	esos, esas, aquellos, aquellas	pron	aquellos, aquellas

REPASO 6

Traduzca las siguientes oraciones

1) It was left on the surface during the process

……

2) They cannot be designed for that temperature

……

3) Those mechanical properties will be found.

……

4) A different carrier is chosen at the beginning

……

5) These theories were not known before.

……

6) This problem is being understood by many students now.

……

7) More fuel resources are required by the developed countries.

……

8) The developing countries are having a growing need of power stations.

……

9) Was it shown in the first figure?

……

10) That book was written in the last century.

……

EJERCICIO 18.1

EXPRESIONES DE PROPÓSITO

Por cada oración dada escriba otras dos formas que expresen propósito y traduzca.

1) It is done *to change* the value of the variable over the course of an equation

a. ……

b. ……

c. ……

Traducción: ……

2) That lever is pulled toward you *for loading* the paper

a. ……

b ……

c. ……

Traducción: ……

3) He stopped the printer *in order to slide* the guide to the left

a. ……

b ……

c. ……

Traducción: ……

4) You must push the lever away from you *to set* the paper bail.

a. ……

b ……

c. ……

Traducción: ……

5) *To shift* the loaded sheet to the right you must use that knob.

a. ……

b ……

c. ……

Traducción: ……

EJERCICIO 18.2

Traduzca las siguientes oraciones

1) It gives a sample program to incorporate many of the techniques and commands discussed in this section.

……

……

2) You can edit the program for changing the assignments in those lines.

……

……

3) Parentheses are used to tell the computer to add the numbers before it divides.

……

……

4) Line 40 adds the variables and divides by 3 in order to get the average.

……

……

5) It's a good idea to count the number of left parentheses and right parentheses to make sure they are equal.

……

……

6) You must type the following statement for returning the computer to the starting state.

……

……

7) In order to do this, you may press a function key or the space bar.

……

……

8) The program below is run to see how the ON command works.

……

……

9) This task is for accessing and maintaining files on disks.

……

……

10) The next step is to select the appropriate graphic mode.

……

……

GLOSARIO DEL EJERCICIO 18.1

Palabra	Función	Significado	Otra función y significado	
away	adv	afuera, dirección contraria		
bail	s	barra de sujeción		
course	s	curso		
in order to	expr	para (propósito)		
knob	s	manija, perilla, picaporte		
left	s	izquierda	adj	izquierdo
lever	s	palanca		
pull	v	tirar	s	tiro
push	v	empujar	s	empuje
slide	v	deslizar/se (irreg. slid, slid)	s	deslizamiento
stop	v	parar, detener	s	parade
toward	prep	hacia		
variable	s	variable	adj	variable

GLOSARIO DEL EJERCICIO 18.2

Palabra	Función	Significado	Otra función y significado			
access	v	acceder				
add	v	agregar, sumar				
appropriate	adj	apropiado				
assignment	s	tarea (asignada)				
bar	s	barra, bar				
command	s	comando, orden	v	ordenar		
count	v	contar				
disk	s	disco				
edit	v	editar				
file	s	archivo, lima	v	archivar, limar		
get	v	obtener, conseguir, etc. (irreg. got, got o gotten)				
graphic	s	gráfico				
how	adv	como				
idea	s	idea				
incorporate	v	incorporar				
line	s	línea				
maintain	v	mantener				
make sure	expr	asegurarse				
mode	s	modo				
or	conj	o				
parentheses	s	paréntesis				
press	v	presionar, oprimir, apretar, prensar	s	prensa		
program	s	programa				
run	v	correr, ejecutar, hacer funcionar, andar (irreg. ran, run)	s	recorrido, tramo		
space	s	espacio	v	separar		
statement	s	enunciado, oración				
task	s	tarea				
technique	s	técnica				
tell	v	decir (irreg. told, told)				
type	v	escribir (a máquina), tipear	s	tipo		
work	v	trabajar, funcionar	s	trabajo		

EJERCICIO 19.1

Lea el siguiente texto

Rules for Typing BASIC Language Programs

You can type and use BASIC language programs even without knowing BASIC. You must type carefully, however, because a typing error may cause the computer to reject your information. The following guidelines will help minimize errors when typing or copying a program listing.

1- Spacing between words is not critical; e.g. typing FORT=1TO10 is the same as typing FOR T = 1 TO 10. However, a BASIC keyword itself must not be broken up by spaces. (See the BASIC 7.0 encyclopedia in Chapter V for a list of BASIC keywords).

2- Any characters can be typed inside quotation marks. Some characters have special functions when placed inside quotation marks. These functions are explained later in this Guide.

3- Be careful with punctuation marks. Commas, colons and semicolons also have special properties, explained later in this section.

4- Always press the RETURN key (indicated in this Guide by ~~**RETURN**~~) after completing a numbered line.

5- Never type more than 160 characters in a program line. Remember, this is the same as four full screen lines in 40-column format, or two full screen lines in 80-column format. See section 8 for more details on 40- and 80-column formats.

6- Distinguish clearly between the letter l and the numeral 1 and between the letter O and the numeral 0.

7- The computer ignores anything following the letters REM on a program line. REM stands for REMark. You can use the REM statement to put comments in your program that tell anyone listing the program what is happening at a specific point.

Follow these guidelines when you type the examples and programs shown in this section.

The PRINT command tells the computer to display information on the screen. You can print both numbers and text (letters), but there are special rules for each case, described in the following paragraphs.

Printing Numbers

To print numbers, use the PRINT command followed by the number(s) you want to print. Try typing this on your Commodore 128.

PRINT 5

Then press the RETURN key. Notice the number 5 is now displayed on the screen.

Printing Text

Now that you know how to print numbers, it's time to learn how to print text. It's actually very simple. Any words or characters you want to display are typed on the screen, with a quote symbol at each end of the string of characters. **String is the BASIC name for any set of characters surrounded by quotes.** The quote character is obtained by pressing SHIFT and the numeral 2 on the top row of the keyboard (not the 2 in the numeric keypad). Try these examples:

PRINT "COMMODORE 128" ~~RETURN~~

PRINT "4*5" ~~RETURN~~

EJERCICIO 19.2

A continuación se dan unas instrucciones para escribir un programa en BASIC. Léalas cuidadosamente y decida si, de acuerdo al texto anterior cada línea de instrucciones es Correcta, Incorrecta o No incluida en las consideraciones del texto. Coloque "C", "I" o "N" delante del número de cada instrucción según su elección. No realice traducción escrita.

1) Type the first program line in this way:

   10 PRINT "THIS IS A SAMPLE PROGRAM"

2) Do not press the RETURN key after completing line 10 and begin the next program line as follows:

   20 FOR X=1 TO 5

3) Press the RTURN key and write:

   30 PRINT "LET'S SEE IF THE 203-CHARACTER STATEMENT IN THIS LINE CAN BE PRINTED 5 TIMES ACCORDING TO THE COMMAND GIVEN IN LINE NUMBER 20. IF NOT, TRY AGAIN PLACING A COLON (:) OR A SEMISOLON (;) AFTER THE LAST WORD

4) Now type:

   40 NEXT X :REM "DON'T FORGET THIS LINE IF YOU WANT TO HAVE LINE 30 PRINTED 5 TIMES"

5) In order to remember who wrote this program add the following:

   50 REM "WRITTEN BY JOHN SMITH"

Let's not worry. The words written in the above line will not appear when you run the program.

EJERCICIO 19.3

Subraye todas las formas imperativas de los Ejercicios 19.1 y 19.2

GLOSARIO DEL EJERCICIO 19.1

Palabra	Función	Significado	Otra función y significado
actual	adj	real, verdadero	
any	adj	cualquier (afir), algún (interr), ningún (neg)	
anyone	adj	cualquiera (afir), alguien (interr), nadie (neg)	
anything	adj	cualquier cosa (afir), algo (interr), nada (neg)	
because	conj	porque	
both	adj	ambos	pron ambos, tanto… como…
break	v	romper, quebrar (irreg. broke, broken) brek up = separar	s pausa, descanso
careful	adj	cuidadoso	
carefully	adv	cuidadosamente	
case	s	caso	
cause	v	causar, hacer (que)	
character	s	caracter (letra), carácter	
clear	adj	claro	
colon	s	dos puntos (:)	
column	s	columna	
comma	s	coma (,)	
comment	s	comentario	v comentar
complete	v	completar	adj completo
copy	s	copia	v copiar
critical	adj	crítico	
describe	v	describir	
display	v	mostrar, exhibir	s muestra, exhibición
distinguish	v	distinguir	
e.g.	abrev	por ejemplo (abrev. de exempli gratia)	
each	adj	cada	pron cada uno
encyclopedia	s	enciclopedia	
end	s	extremo, fin	v finalizar
error	s	error	
format	s	formato	
four	num	cuatro	
full	adj	lleno, completo	
guide	s	guía	v guiar
guideline	s	pauta, directiva	
happen	v	suceder	
help	v	ayudar	s ayuda
however	adv	sin embargo	
ignore	v	ignorar	
indicate	v	indicar	
information	s	información	
inside	adv	dentro de, adentro	adj interior
itself	adj réflex	en sí, propiamente dicho	
keypad	s	bloque de teclas, teclado	
keyword	s	palabra clave	
language	s	idioma, lenguaje	
learn	v	aprender	
letter	s	letra, carta	
list	v	listar	s lista
mark	s	marca, símbolo	v marcar
minimize	v	reducir, minimizar	
notice	v	notar, observar	s nota, anuncio
numeral	s	numeral	
numeric	adj	numérico	
paragraph	s	párrafo	

point	s	punto		
print	v	imprimir		
punctuation	s	puntuación		
quotation marks		comillas		
quote	s	comilla	v	citar
reject	v	rechazar		
remark	s	acotación, comentario		
row	s	fila		
rule	s	regla		
same	adj	mismo, (the same as = lo mismo que)		
semicolon	s	punto y coma (;)		
special	adj	especial		
specific	adj	específico		
stand for	v	representar, significar		
string	s	cadena (en computación), cuerda		
surround	v	rodear, circundar		
text	s	texto		
than	conj	que (en comparativo)		
then	adv	luego, entonces	conj	entonces, en ese caso
top	s	parte superior		
want	v	querer		
what	pron rel	lo que,	pron interr.	qué, cual
when	adv	cuando	pron interr.	Cuando
without	prep	sin		
your	adj pos	su (de Ud., de Uds.)		

EJERCICIO 20.1
THERE BE

Complete los espacios en blanco con There is o There are y traduzca.

1) _____, of course, an exception to the previous statement.

……

2) _____ many engineers interested in heat engine design, oil refining, and manufacturing. .

……

3) _____ much sulfur dioxide in the stack gas? (interrog.)

……

4) _____ a conversion of carbon to either carbon dioxide or carbon monoxide.

……

5) _____ few power plant furnaces running at very low or zero excess air.

……

EJERCICIO 20.2
Traduzca las siguientes oraciones

1) *There will be* a tendency for smoke formation during the process.

……

2) *There may not be* a change in the value of the variable.

……

3) *There were* small percentages of CO2, SO2, and ash in the combustion.

……

4) *There must not be* a program line with 180 characters or more

……

5) According to the law of conservation of matter *there cannot be* mass created or destroyed.

……

GLOSARIO DE LOS EJERCICIOS 20.1 y 20.2

Palabra	Función	Significado	Otra función y significado
according to	adv	de acuerdo con, según	
ash	s	ceniza	
carbon	s	carbono	
combustion	s	combustión	
conservation	s	conservación	
destroy	v	destruir	
dioxide	s	dióxido, anhídrido	
either	expr	o… o…, tanto… como…	
exception	s	excepción	
excess	s	exceso	
formation	s	formación	
furnace	s	horno	
heat	s	calor	*heat engine (máquina términa)*
manufacture	v	fabricar	
mass	s	masa	
matter	s	materia	
monoxide	s	monóxido	
much	adj	mucho	
of course	expr	por supuesto	
percentage	s	porcentaje	
previous	adj	previo	
refine	v	refinar	
smoke	s	humo	
stack	s	chimenea	
sulfur	s	azufre	
tendency	s	tendencia	
there are	v	hay (presente del verbo “there be” usado delante de formas plurales)	
there is	v	hay (presente del verbo “there be” usado delante de formas singulares)	
zero	num	cero	

EJERCICIO 21.1

PRONOMBRES OBJETIVOS

Reemplace las palabras subrayadas por pronombres personales u objetivos y traduzca las oraciones con dichas substituciones, subrayando los correspondientes pronombres (en inglés y en castellano).

1) A chemical engineer is often concerned with the characteristics of mixtures and solutions.

……

2) These separations involve changes in that composition.

……

3) Few students can make use of the same principle of mass transfer.

……

4) Dr. Jones and I were studying processes to separate or purify chemicals by distillation

……

2) Mary gave Jim several assignments in advance.

……

EJERCICIO 21.2

Traduzca las siguientes oraciones

1) You must show us the way to design it.

……

2) They don't know you but they know me very well.

……

3) Filtration and settling are required to segregate them.

……

4) I didn't believe him until I saw you.

……

5) The screen was behind her.

……

6) They told us that it was not for us.

……

7) Slide it in front of them.

……

8) Let's keep them for him.

……

9) He can guide you through them.

……

10) Please, send it to me by plane.

……

GLOSARIO DE LOS EJERCICIOS 21.1 y 21.2

Palabra	Función	Significado	Otra función y significado
believe	v	creer	
characteristic	s	característica	
chemical	adj	químico	
composition	s	composición	
concern	v	relacionar, ocuparse, preocuparse	
distillation	s	destilación	
filtration	s	filtrado, filtración	
her	pron obj	la, le, ella	
him	pron obj	lo, le, el	
involve	v	implicar, involucrar, incluir	
me	pron obj	me, mi	
mixture	s	mezcla	
please	expr	por favor	
principle	s	principio	
purify	v	purificar	
segregate	v	segregar	
send	v	enviar (irreg. sent, sent)	
separate	v	separar	
separation	s	separación	
settling	s	decantación, asentamineto	
solution	s	solución	
them	pron obj	los, las, les, ellos, ellas	
transfer	s	transferencia	v transferir
us	pron obj	nos, nosotros, nosotras	

EJERCICIO 22.1
ADJETIVOS POSESIVOS

Complete los espacios en blanco con el ADJETIVO POSESIVO correspondiente al sujeto de cada oración y traduzca. Subraye el adjetivo posesivo en castellano.

1) The gas in the container was not at _____ initial pressure and temperature.

……

2) Nitrogen and oxygen will mix until _____ concentration is uniform throughout.

……

3) Charles supposed that _____ mixture had only two components present.

……

4) We may visualize _____ process by considering Fig. 12.

……

5) I brought _____ pressure gage for the experiment.

……

6) The vessel and _____ boiling water will be placed on that table.

……

7) Those students had _____ class in the new laboratory.

……

8) Mrs. Douglas left _____ books here because we needed them.

……

9) Note that _____ results will not always be the same.

……

10) Gas diffusion and _____ concentration gradient are referred to mathematically.

……

GLOSARIO DEL EJERCICIO 22.1

Palabra	Función	Significado	Otra función y significado	
always	adv	siempre		
boil	v	hervir		
book	s	libro		
component	s	componente		
concentration	s	concentración		
container	s	contenedor, recipiente		
diffusion	s	difusión		
gage	s	medidor (pressure gage = manómetro)		
gradient	s	gradiente		
here	adv	aquí, acá		
initial	adj	inicial	s	inicial
mathematical	adj	matemático (mathematically = matemáticamente)		
mix	v	mezclar		
Mrs.	s	señora (abrev de Mistress = señora)		
nitrogen	s	nitrógeno		
note	v	notar, observar	s	nota
only	adv	solo, solamente		
oxygen	s	oxígeno		
present	adj	presente	s	presente
refer (to)	v	referir/se, mencionar		
student	s	estudiante		
suppose	v	suponer		
table	s	mesa, table (numérica)		
throughout	adv	completamente, por todos lados	prep	por todo, en todo
uniform	s	uniforme		
vessel	s	recipiente, vasija, navío		
visualize	v	visualizar		

EJERCICIO 23.1

TEXTO - Chemical & Thermal processes

12.1 INTRODUCTION

In this chapter, we will briefly describe some of the chemical and thermal concepts used in the practice of engineering and show typical examples of their applications. Much of the material contained in this chapter often falls in the areas of chemical and/or mechanical engineering. The application of these principles can be found in such diverse areas as air pollution control, power generation, heat engine design, oil refining, and manufacturing.

12.2 CONSERVATION OF MATTER

The engineer calls the law of conservation of matter a material balance. The law of conservation of matter states simply that matter (mass) cannot be created or destroyed. There is, of course, an exception to the previous statement. In atomic fission, the simple material balance does not hold, since in this process, matter is transformed into energy.

For an example of the application of a material balance let us consider a power plant. We are interested in calculating the quantity and composition of the stack gas, i.e., in particular how much sulfur dioxide and particulate matter is produced by a typical power plant. Let us assume, for purposes of this example, that we are going to use coal, and that we will burn 560,000 pounds per hour (as shown later, this is *approximately* the amount required for *one* 800 megawatt power plant.

In the combustion process, the coal is burned in the presence of air, liberating heat and producing combustion products. Coal consists chemically of carbon, hydrogen, oxygen, nitrogen and inerts (ash). During combustion the carbon is converted to either carbon dioxide or carbon monoxide

$$C + O_2 \longrightarrow CO_2$$

$$2C + O_2 \longrightarrow 2CO$$

and the hydrogen to water vapor

$$2H_2 + O_2 \longrightarrow 2H_2O$$

Essentially all of the carbon (more than 99.9%) is converted to CO_2 and very little to CO.

As an example of our material balance calculation consider the coal described in the following table:

Constituent	Weight percent
Carbon	77
Hydrogen	-5
Sulfur	8
Water	3
Ash	7

Let us suppose that the combustion takes place with 20% excess air (20% more oxygen than required for burning all the combustibles). Power plant furnaces seldom run at very low or zero excess air because of the tendency for smoke formation. Typical values of excess air are 10-20% for fuel oil and 20-40% for coal. We wish to calculate the amounts and percentages of CO_2, SO_2, and ash in the combustion gases when 560,000 lb/hr. of coal are burned. First, we must calculate the number of pounds of carbon, hydrogen, and sulfur that are burned each hour, using the analyses above and the coal firing rate (560,000 lb/hr.).

$$\text{Weight carbon burned} = \left(0.77 \frac{lb\ carbon}{lb\ coal}\right)\ \left(560{,}000 \frac{lb\ coal}{hr}\right)$$

Weight carbon burned = 431,000 lbs/hr.

$$\text{Weight hydrogen burned} = \left(0.05 \frac{lb\ hydrogen}{lb\ coal}\right)\ \left(560{,}000 \frac{lb\ coal}{hr}\right)$$

Weight hydrogen burned = 28,000 lbs/hr.

$$\text{Weight sulfur burned} = \left(0.08\ \frac{lb\ sulfur}{lb\ coal}\right)\ \left(560{,}000 \frac{lb\ coal}{hr}\right)$$

Weight sulfur burned = 44,800 lbs/hr.

Now, we must calculate the number of moles of these components burned in order to calculate the air requirements (using the molecular weights of the species involved).

$$\text{Moles carbon burned} = \frac{431{,}000\ lb\ carbon\ hr}{12\ lbs/lb\ mole}$$ (molecular weight of carbon is 12)

Moles carbon burned = 35,900 lb moles/hr

$$\text{Moles hydrogen } (H_2) \text{ burned} = \frac{28{,}000\ lb/hr}{2\ lbs/lb\ mole}$$ (molecular weight of hydrogen is 2)

Moles H_2 burned = 14,000 lbs mole/hr

$$\text{Moles sulfur burned} = \frac{44{,}800\ lb/hr}{32\ lbs/lb\ mole}$$ (molecular weight of sulfur is 32)

The theoretical amount of oxygen required to burn each of these components is calculated as follows:

For carbon, which burns to form CO_2,

$$C + O_2 \longrightarrow CO_2$$

one mole of oxygen is required for each mole of carbon burned. Hence, 35,900 lb moles require 35,900 lb moles of oxygen. Furthermore, each lb mole of any gas occupies 379 ft^3 measured (at 14.7 psia and 60° F); thus for burning carbon, the oxygen requirement is

O_2 required for carbon = (35,900 lb moles/hs) (379 $\frac{ft3}{lb\ mole}$)

= 13,600,000 ft^3/hr

Similarly, for hydrogen, which burns to form water vapor,

$H_2 + ½\ O_2 \longrightarrow H_2O$

one–half mole of oxygen is required for each mole of hydrogen burned. Hence, 14,000lb moles of hydrogen require 0.5 (14,000) = 7,000 lb moles of oxygen. Converting to cubic feet,

O_2 required for hydrogen = (7,000 lb moles/hs) (379 $\frac{ft3}{lb\ mole}$)

= 2,650,000 ft^3/hr

For combustion of sulfur, which burns to form SO_2,

$S + O_2 \longrightarrow SO_2$

one mole of oxygen is required for each mole of sulfur burned. Hence, 1,400 lb moles of sulfur require 1,400 lb moles of oxygen. Converting to cubic feet,

O_2 required for sulfur = (1,400 lb moles/hs) (379 $\frac{ft3}{lb\ mole}$)

= 530,000 ft^3/hr

The theoretical O_2 required to burn carbon, hydrogen and sulfur, then is

Theoretical O_2 requirement = 13,600,000 + 2,650,000 + 530,000

= 16,780,000 ft^3/hr

Since air contains only 21% oxygen, then the amount of air required to provide 16,780,000 ft^3/hr of oxygen is

Theoretical air requirement = $\frac{16{,}780{,}000\ ft3\ O2/hr}{o.21\ ft3\ O2/\ ft3\ air}$

Theoretical air requirement = 79,700,000 ft^3 air/hr

However, this furnace is to operate with 20% excess air. Hence, the actual air requirement is the theoretical air requirement plus 20% of the theoretical air requirement.

Actual air requirement = 1.20 (79,700,000 ft^3)

= 95,600,000 ft^3/hr

Note that nearly 100 million ft^3/hr is required to burn the coal for an 800 megawatt power plant.

GLOSARIO DEL EJERCICIO 23.1 Chemical & Thermal processes

Palabra	Función	Significado	Otra función y significado	
analysis	s	análisis		
application	s	aplicación, solicitud		
asume	v	suponer		
atomic	adj	atómico		
balance	s	equilibrio, balance	v	equilibrar, balancear
briefly	adv	brevemente, abreviadamente		
burn	v	quemar		
calculate	v	calcular		
calculation	s	cálculo		
call	v	llamar/se	s	llamada
consist	v	consistir		
component	s	componente		
contain	v	contener		
convert	v	convertir		
cubic	adj	cúbico		
diverse	adj	diverso		
either… or…	expr	tanto… como…		
essentially	adv	esencialmente		
fall	v	caer/se	s	caída, catarata, otoño
firing rate	expr	poder calorífico		
fission	s	fisión		
form	v	formar	s	forma
furthermore	adv	además		
hence	adv	luego, por lo tanto		
hold	v	mantener, fijar (irreg. held, held)		
how much	adv	cuanto		
inert	s	materias inertes		
liberate	v	liberar		
little	adv	poco		
mole	s	mol		
occupy	v	ocupar		
particular	adj	particular		
pound	s	libra (450 gr); abrev lb		
practice	s	práctica	v	practicar
presence	s	presencia		
product	s	producto		
psia	abrev	pounds per square inch absolute : libras por pulgadas cuadrada absoluta		
quantity	s	cantidad		
seldom	adv	rara vez		
simply	adv	simplemente		
since	conj	dado que, ya que	prep	desde
species	s	especie, clase		
such	adj	tales, dichos. En singular: such a = tal, dicho		
take place	v (expr)	tener lugar, ocurrir		
theoretical	adj	teórico		
transform	v	transformar		
weight	s	peso, pesa		
which	pron rel	que	pron interr	cuál
wish	v	desear	s	deseo

EJERCICIO 23.2
Extraiga del texto anterior la siguiente información:

1) Why cannot the simple material balance be applied in atomic fission?

……

2) Definition of “excess air” in a combustion process.

……

3) Results of running a power plant with zero excess air.

……

4) Volume of 2 moles of hydrogen (at 14.7 psia and 60° F)

……

5) Moles of oxygen required for burning 5.5 moles of carbon.

……

6) An example of the approximate weight of ash that may be found after burning 5000 lb of coal.

……

7) Differences in the amounts of air needed for the combustion of fuel oil and coal.

……

8) Fields of engineering related to the subjects contained in the text.

……

9) An approximate idea of the coal consumption of a 400 megawatt power plant (in lb/hr).

……

10) The percentage of carbon that may usually be converted into carbon monoxide when coal is burned in a power plant.

……

EJERCICIO 24.1

Lea el siguiente texto

Direct current electricity

All circuits must contain a source of electromotive force to establish the difference of potential that makes possible the current flow. This source may be a dry cell, a mechanical generator, or any of the other devices that will be discussed later in this book. All paths of the circuit lead in closed loops from the high-potential (negative) end of the electromotive-force source to its low-potential (positive) end.

The current in a circuit may flow through solid conductors, liquids, gases, vacuums, or any combinations of these. Its path may include lamps, toasters, motors, or any of the thousand-and-one electrical devices available in this electrical age. But, regardless of the type of circuit and the devices through which the current flows, all circuits offer some resistance to the current.

This resistance may be high or low, depending upon the type of circuit and the devices employed. Sometimes this resistance is undesirable, as, for example, the resistance of the wires connecting the various devices in a circuit. Accordingly, we keep this resistance at a low level by using wires made of copper having a large cross-sectional area, and by keeping their lengths as short as possible. Sometimes, however, it is desirable to introduce concentrated, or lumped, resistances into the circuit. Such a lumped resistance is called a **resistor.** In electrical diagrams the symbol for a **fixed** resistor – that is, one whose resistance is constant- is The symbol for a **variable** resistor is 

In this chapter, we will consider three general types of circuits. One is the **series** circuit, which offers a single, continuous, external path for current flow from the negative side of the electromotive-force source to the positive side. Another is the **parallel** circuit, which offers two or more parallel paths for current flow from negative to positive. The third type is the **series-parallel** circuit, a combination of the other two.

GLOSARIO DEL EJERCICIO 24.1

Palabra	Función	Significado	Otra función y significado
accordingly	adv.	así, consecuentemente, en consecuencia	
age	s.	era, edad	
electromotive	adj.	electromotriz	
establish	v.	establecer	
fixed	adj.	fijo	
lead	v.	conducir	s. plomo
loop	s.	vuelta, lazo, bucle	
lump	v.	agrupar	
parallel	adj.	paralelo	
path	s.	camino, recorrido, trayectoria	
toaster	s.	tostador	
undesirable	adj.	indeseable	
vacuum	s.	vacío	

EJERCICIO 24.2

Traduzca las siguientes oraciones y decida si son **verdaderas** o **falsas** de acuerdo al texto en EJERCICIO 24.1

1) A resistor is a lumped resistance.

……

2) They use copper wires with a large cross-sectional area in order to keep resistance low.

……

3) There are a thousand and one electrical devices in this electrical age.

……

4) Most circuits offer some resistance to the current.

……

5) The parallel circuit offers a parallel path for the current flow.

……

EJERCICIO 25.1
ADVERBIOS

Complete los espacios con los adjetivos dados entre paréntesis o con los adverbios correspondientes y traduzca.

1) We will _____ describe some of the chemical and thermal concepts used in the practice of engineering. (brief)

……..

……..

2) How much sulfur dioxide is produced by a _____ power plant? (typical)

……..

……..

3) This is _____ the amount required for one 800 megawatt power plant. (approximate)

……..

……..

4) Coal consists _____ of carbon, hydrogen, oxygen, nitrogen and inerts. (chemical)

……..

……..

5) It was a _____ defined concept of what is understood by “excess air”. (good)

……..

……..

6) He **hardly** speaks English because he finds it very _____. (hard)

……..

……..

7) In that type of circuit the current flow will be _____ small. (considerable)

……

……..

8) The law of conservation of matter states _____ (simple) that matter cannot be created or destroyed.

……

……..

9) (Essential) _____ all of the carbon is converted to CO2, and very little to CO.

……..

……

10) It is (actual) _____ very simple to learn how to print text.

……..

……

REPASO 7

Escriba en castellano las siguientes oraciones

1. Laws governing the behavior of electric charges will be developed.

……..

2. The current in a circuit may flow through solid or liquid conductors or, vacuums.

……..

3. In the tension test a specimen is subjected to increasing elongation until it fractures.

……..

4. The operating temperature is well above 1,000° C.

……..

5. Sometimes the resistance of the wires connecting the various devices in a circuit is undesirable.

……..

……..

6. The tensile load and elongation are measured at frequent intervals.

……..

7. You must consider the growing interest in home computers.

……..

8. We will briefly describe some of the chemical and thermal concepts used in the practice of engineering and show typical examples of their applications.

……..

……..

9. The application of these principles can be found in such diverse areas as air pollution control, power generation, heat engine design, oil refining, and manufacturing.

……..

……..

10. In passing through the passive element, the current creates a voltage drop.

……..

11. Let us assume, for purposes of this example, that we will burn 560,000 pounds per hour, this is approximately the amount required for one 800 megawatt power plant.

……..

……..

12. Suppose that the combustion takes place with 20% excess air, 20% more oxygen than required for burning all the combustibles.

……..

……..

13. We must calculate the number of pounds of carbon, hydrogen, and sulfur that are burned each hour, using the analyses above and the coal firing rate.

……..

……..

14. Furthermore, each lb mole of any gas occupies 379 ft^3 measured; thus for burning carbon, the oxygen requirement is …

……..

……..

15. Since air contains only 21% oxygen, then the amount of air required to provide 16,780,000 ft^3/hr of oxygen is 79,700,000 ft^3 air/hr.

……..

……..

16. The actual air requirement is the theoretical air requirement plus 20% of the theoretical air requirement.

……..

……..

17. All circuits must contain a source of electromotive force; this source may be a dry cell or a mechanical generator.

……..

……..

18. All paths of the circuit lead in closed loops from the high-potential (negative) end of the electromotive-force source to its low-potential (positive) end.

……..

……..

19. The normal stress is defined as the ratio of the load on the sample to the original cross-sectional area.

……..

……..

20. One is the series circuit, which offers a single, continuous, external path for current flow from the negative side of the electromotive-force source to the positive side.

……..

……..

NUMEROS ORDINALES Y CARDINALES

1	one	**1st**	first
2	two	**2nd**	second
3	three	**3rd**	third
4	four	**4th**	fourth
5	five	**5th**	fifth
6	six	**6th**	sixth
7	seven	**7th**	seventh
8	eight	**8th**	eighth
9	nine	**9th**	ninth
10	ten	**10th**	tenth
11	eleven	**11th**	eleventh
12	twelve	**12th**	twelfth
13	thirteen	**13th**	thirteenth
14	fourteen	**14th**	fourteenth
15	fifteen	**15th**	fifteenth
16	sixteen	**16th**	sixteenth
17	seventeen	**17th**	seventeenth
18	eighteen	**18th**	eighteenth
19	nineteen	**19th**	nineteenth
20	twenty	**20th**	twentieth
21	twenty-one	**21st**	twenty-first
22	twenty-two	**22nd**	twenty-second
30	thirty	**30th**	thirtieth
40	forty	**40th**	fortieth
50	fifty	**50th**	fiftieth
60	sixty	**60th**	sixtieth
70	seventy	**70th**	seventieth
80	eighty	**80th**	eightieth
90	ninety	**90th**	ninetieth
100	a/one hundred	**100th**	hundredth
101	a/one hundred and one	**101st**	hundred and first
200	two hundred	**200th**	two hundredth
1,000	a/one thousand	**1,000th**	thousandth
10,000	ten thousand	**10,000th**	ten thousandth
100,000	a/one hundred thousand	**100,000th**	one hundred thousandth
1,000,000	a/one million	**1,000,000th**	one millionth
1,000,000,000	a/one billion (en castellano 10^{12})	**1,000,000,000th**	one billionth

Nota: Observe que los miles se separan con comas
EJEMPLOS:

1,005	one thousand and five
1,608	one thousand six hundred and eight
90,435	ninety thousand four hundred and thirty-five
500,000	five hundred thousand
3,755,372	three million seven hundred and fifty-five thousand three hundred and seventy-two

DECIMALES

Se escribe:	Se dice:
0.3	nought **point** three zero **point** three
3.45	three **point** four five (NOT three point forty-five)
98.4	ninety-eight **point** four
$1.55	one dollar, fifty-five cents one dollar, fifty-five
$700.00	seven hundred dollars
€3,500.50	three thousand five hundred euro and fifty cents three thousand five hundred euro, fifty cents

Nota: Observe que los decimales se separan con punto

EJEMPLOS:

0	zero (también se lee como la letra “o”)
0.5 = .5	zero point five (point five)
0.01 = .01	zero point “o” one (point “o” one)
0.001 = .001	zero point double “o” one (point double “o” one)
3.1416	three point one four one six

FRACCIONES Y OTRAS EXPRESIONES MATEMÁTICAS

Se escribe:	Se dice:
½	a half ó one half
¼	a quarter ó one quarter
¾	three quarters
⅓	a third ó one third
⅔	two thirds
⅕	a fifth ó one fifth
⅗	three fifths
⅛	an eighth ó one eighth
⅝	five eighths
1½	one and a half
5¾	five and three quarters
3 5/12	three and five twelfths
1/n	one nth
$X = a^2$	X equals a squared
$X = a^3$	X equals a cubed
a^n	a to nth (power)
a^{-n}	a to the minus nth
$\sqrt{a}$	square root of a
$\sqrt[3]{a}$	cubed root of a

OPERACIONES MATEMÁTICAS

Operación	Verbo	Se expresa
Addition	To add	a + b = c : a plus b equals c
Substraction	To substract	a - b = c : a minus b equals c
Multiplication	To multiply	a x b = c : a times b equals c
Division	To divide	a / b = c : a divided by b equals c
Differentiation	To differentiate	dx : differential dx
Derivation	To derive	dy/dx : derivative of y with respect to x dx/dt : time derivative of x
Integration	To integrate	$\int_a^b f(x)\,dx$: integral of x from a to b of f of x x dx

OTRAS EXPRESIONES USADAS EN MATEMÁTICAS O GEOMETRÍA

digit	dígito
figure	cifra
integer	entero
a is greater than b	a > b
a is less than b	a < b
the ratio of a to b	el cociente entre a y b (cociente de a sobre b)
at random	al azar
arithmetic mean	media aritmética
straight line	línea recta
locus	lugar geométrico (o representación gráfica=
slope	pendiente
to label the axes	marcar/rotular los ejes
to plot y against x	representar (graficar) y en función de x
full/solid line	línea de trazo continuo
dashed line	línea de trazos
dotted line	línea de puntos
cutaway view	vista de corte
scale	escala
scale model	modelo a escala
full size	escala natural/real
80 km an hour	80 km por hora
once	ona vez
twice	dos veces
three times	tres veces

EJERCICIO 26.1
NÚMEROS

Escriba en números

1) two fifths plus three and a half ……

2) square root of nine hundred thousand and eighty-one ……

3) thirteen hundred times eight hundred and seventy-eight ……

4) point o three squared plus nineteen cubed ……

5) four thousand and six times point two five ……

6) ten halves minus x to the nth ……

7) seventeen hundred point four nine divided by two to the eleventh ……

8) the fourth root of forty million two hundred and sixty-one thousand four hundred and one: ……

9) two sevenths divided by the square root of seventy-nine thousand five hundred …….

10) thirteen squared minus thirty cubed ……

GLOSARIO GENERAL

Palabra	Función	Significado	Otra función y significado			
A						
a	art	un, uno, una				
ability	s	habilidad, capacidad				
above	prep	arriba, por encima de				
access	v	acceder				
according to	adv	de acuerdo con, según				
actual	adj	verdadero, real				
add	v	agregar, sumar				
admittance	s	admitancia				
advance	s	adelanto, anticipación	v	adelantar		
against	prep	contra				
air	s	aire				
aircraft	s	aeronave				
algebraic	adj	algebraico				
all	adj	todos/as				
alloy	s	aleación				
almost	adv	casi				
always	adv	siempre				
am	v	soy, estoy				
amount	s	cantidad	v	valer		
an	art	un, uno, una				
analysis	s	análisis				
and	conj	y				
annual	adj	annual				
anode	s	ánodo				
any	adj	cualquier (afir), algún (interr), ningún (neg)				
anyone	adj	cualquiera (afir), alguien (interr), nadie (neg)				
anything	adj	cualquier cosa (afir), algo (interr), nada (neg)				
appear	v	aparecer				
application	s	aplicación, solicitud				
apply	v	aplicar				
appropriate	adj	apropiado				
approximately	adv	aproximadamente				
are	v	eres, sos, son, estás, están				
as	adv	como	conj	como	adv	a medida que
ash	s	ceniza				
as regards	frase adv.	con respecto a				
assignment	s	tarea (asignada)				
assume	v	suponer				
at	prep	en, a				
atomic	adj	atómico				
attempt	s	intento				
auxiliary	adj	auxiliar				
available	adj	disponible				
average	s	promedio, medio				
away	adv	afuera, dirección contraria				
axis	s	eje				

B

B.C.	abrev	antes de Cristo (Before Christ)		
bad	adj	malo		
bail	s	barra de sujeción		
balance	s	equilibrio, balance	v	equilibrar, balancear
bar	s	barra, bar		
basic	adj	básico		
basis	s	fundamento, base		
beam	s	haz, rayo, viga		
because	conj	porque		
become	v	hacerse, volverse, convertirse (irreg. became, become)		
before	prep	antes de, delante de		
begin	v	empezar (irreg. began, begun)		
behavior	s	comportamiento		
behind	prep	detrás de		
believe	v	creer		
below	prep	por debajo de		
beside	prep	al lado de, junto a		
between	prep	entre		
beyond	prep	más allá		
boil	v	hervir		
book	s	libro		
both	adj	ambos	pron	ambos, tanto… como…
box	s	caja, cajón		
branch	s	rama, sucursal		
break	v	romper, quebrar (irreg. broke, broken)	break up = separar	s pausa, descanso
briefly	adv	brevemente, abreviadamente		
bring	v	traer (irreg. brought, brought)		
broadcasting	s	transmisión		
built-in	adj	integrado/a		
burn	v	quemar		
bus	s	ómnibus		
but	conj	pero, sino	prep	excepto
buzz	s	zumbido, chicharra		
by	prep	por	(by bus = en ómnibus)	

C

cable	s	cable		
calculate	v	calcular		
call	v	llamar/se	s	llamada
can	v. modal	poder		
capita	s	cápita, cabeza		
car	s	auto		
carbon	s	carbono		
careful	adj	cuidadoso		
carefully	adv	cuidadosamente		
carrier	s	portador/a		
case	s	caso		
cause	v	causar, hacer (que)		
century	s	siglo		
change	v	cambiar, variar	s	cambio
chapter	s	capítulo		
character	s	caracter (letra)		
characterize	v	caracterizar		

charge	s	carga	v	cargar
cheap	adj	barato		
chemical	adj	químico		
chief	s	jefe	adj	principal
child	s	niño, chico/a		
choice	s	eleccción		
choose	v	elegir (irreg. chose, chosen)		
class	s	clase		
clear	adj	claro		
close	adj	cercano (close to =cercano a)	v	cerrar
cloud	s	nube		
coal	s	carbón (mineral)		
coaxial	adj	coaxil		
colon	s	dos puntos (:)		
color	v	colorear	s	color
column	s	columna		
comma	s	coma (,)		
command prompt	s	línea de comandos, símbolo del sistema		
command	s	comando, orden	v	ordenar
comment	s	comentario	v	comentar
complete	v	completar	adj	completo
complexity	s	complejidad		
component	s	componente		
concern	v	relacionar, ocuparse, preocuparse		
conclude	v	concluir		
consider	v	considerar		
consist	v	consistir		
consumption	s	consumo		
contain	v	contener		
container	s	contenedor, recipiente		
convert	v	convertir/se		
copy	s	copia	v	copiar
count	v	contar		
country	s	país, campo		
course	s	curso		
create	v	crear		
creep	s.	deformación por fluencia		
criterion	s	criterio		
critical	adj	crítico		
cross-sectional	adj	transversal		
cubic	adj	cúbico		
current	s	corriente		
curve	s	curva		

D

datum	s	dato		
define	v	definir		
degree	s	grado		
deliver	v	entregar		
demand	s	demanda	v	demandar, exigir
depend	v	depender (depend on/upon= depender de)		
describe	v	describir		
design	s	diseño	v	diseñar
desire	v	desear	s	deseo
destroy	v	destruir		

determine	v	determinar		
develop	v	desarrollar		
development	s	desarrollo		
device	s	aparato, dispositivo, artefacto		
die	s	matriz	v	morir
difference	s	diferencia		
dioxide	s	dióxido, anhídrido		
directory	s	directorio		
discuss	v	discutir, tratar		
dish	s	plato		
disk	s	disco		
disperse	v	dispersar		
display	v	mostrar, exhibir	s	muestra, exhibición
distinguish	v	distinguir		
diverse	adj	diverso		
divide	v	dividir		
dollar	s	dólar		
door	s	puerta		
drop	s	caída, gota	v	dejar caer
drum	s	tambor		
during	prep	durante		
dynamo	s	dínamo, generador		

E

e.g.	abrev	por ejemplo (abreviatura de exempli gratia)		
each	adj	cada	pron	cada uno
early	adj	temprano, primitivo, primeros		
earth	s	tierra		
easy	adj	fácil		
echo	s	eco, repetición	v	producir eco
edit	v	editar		
either	expr	o… o…, tanto… como…		
either… or…	expr	tanto… como…		
elastically	adv	elásticamente		
elongation	s	alargamiento		
emphasis	s	énfasis		
end	s	extremo, fin	v	finalizar
energy	s	energía		
engine	s	motor, máquina		
engineer	s	ingeniero		
environment	s	medio, medioambiente		
environmental	adj	ambiental		
equal	adj	igual		
error	s	error		
even	adv	incluso, aún	adj	parejo, par
every	adj	cada, todo		
example	s	ejemplo		
exceed	v.	exceder		
excess	s	exceso		
exist	v	existir		
expect	v	esperar		
expensive	adj	caro		
explain	v	explicar		
express	v	expresar		

F

fact	s	hecho		
fall	v	caer/se	s	caída, catarata, otoño
fast	adj	rápido		
feedback	s	realimentación, retoalimentación		
few	adj	pocos (a few = unos pocos)		
figure	s	figura, cifra	v	figurar, imaginar
file	s	archivo, lima	v	archivar, limar
filtration	s	filtrado, filtración		
final	adj	final		
find	v	encontrar (irreg. found, found)		
fine	adj	fino		
fire	v	alimentar, disparar	s	fuego
firing rate	expr	poder calorífico		
first	adj	primero		
fission	s	fisión		
flash	s	destello	v	destellar
float	v.	flotar		
floor	s	piso		
follow	v	seguir		
food	s	comida, alimento		
foot	s	pie		
for	prep	para, por		
form	v	formar	s	forma
forward	adj	inclinada, hacia adelante		
four	numer	cuatro		
fracture	v	fracturar		
frequent	adj	frecuente		
from	prep	de, desde		
fuel	s	combustible		
fulfill	v	cumplir, llenar		
full	adj	lleno, completo		
function	s	función	v	funcionar
furnace	s	horno		
furthermore	adv	además		

G

gage	s	medidor (pressure gage = manómetro)		
gas	s	gas (a veces gasolina)		
generate	v	generar		
get	v	obtener, conseguir, etc. (irreg. got, got o gotten)		
give	v	dar (irreg. gave, given)		
glass	s	vidrio, vaso		
go	v	ir (irreg. went, gone)		
good	adj	bueno		
gradient	s	gradiente		
graphic	s	gráfico		
great	adj	gran, grande		
group	s	grupo		
grow	v	crecer (irreg. grew, grown)		
growth	s	crecimiento		
guide	s	guía	v	guiar
guideline	s	pauta, directiva		

H

half	s	mitad		
happen	v	suceder		
have	v	tener (irreg. had, had)		
heat	s	calor		
heavy	adj	pesado		
help	v	ayudar	s	ayuda
hence	adv	luego, por lo tanto		
her	pron obj	la, le, ella		
here	adv	aquí, acá		
hero	s	héroe		
high	adj	alto		
him	pron obj	lo, le, el		
hold	v	mantener, fijar (irreg. held, held)		
home	s	hogar, casa		
house	s	casa		
housing	s.	carcasa, cubierta		
how much	adv	cuanto		
how	adv	como		
however	adv	sin embargo		
hydroelectric	adj	hidroeléctrico		
hydropower	s.	energía hidráulica		

I

i.e.	adv	es decir (Latin, abbr: id est: that is)		
idea	s	idea		
ideal	adj	ideal		
ignore	v	ignorar		
in front of	prep	en frente de		
in order to	expr	para (propósito)		
in	prep	en		
inch	s	pulgada		
include	v	incluir		
incorporate	v	incorporar		
increase	s	aumento	v	aumentar
indicate	v	indicar		
industrial	adj	industrial		
industrialize	v	industrializar		
inert	s	materias inertes		
input	s	entrada		
inside	adv	dentro de, adentro	adj	interior
interval	s	intervalo		
into	prep	en, dentro de		
involve	v	implicar, involucrar, incluir		
iron	s	hierro		
is	v	es, está		
itself	adj réflex	en sí, propiamente dicho		

J

jet	s	chorro		

K

keep	v	mantener, conserver (irreg. kept, kept)		

keypad	s	bloque de teclas, teclado			
keyword	s	palabra clave			
knife	s	cuchillo			
knob	s	manija, perilla, picaporte			
know	v	saber, conocer (irreg. knew, known)			

L

laboratory	s	laboratorio (abrev. Lab)			
land	v	aterrizar		s	tierra, territorio
landscape	s.	paisaje			
language	s	idioma, lenguaje			
large	adj	grande			
last	adj	último			
late	adj	tarde			
later	comp	más tarde, después			
law	s	ley			
leaf	s	hoja			
learn	v	aprender			
leave	v	salir, dejar (irreg. left, left)			
left	s	izquierda		adj	izquierdo
length	s	longitud			
letter	s	letra, carta			
lever	s	palanca			
liberate	v	liberar			
life	s	vida			
light	adj	liviano	s	luz	
line	s	línea			
linear	adj	lineal			
list	v	listar		s	lista
little	adv	poco			
living	s	vida			
load	s	carga		v	cargar
long	adj	largo			
look	v	mirar		s	apariencia
low	adj	bajo			
lower	adj	inferior			

M

magnet	s	imán
main	adj	principal
maintain	v	mantener
make sure	expr	asegurarse
make	v	hacer (irreg. made, made)
maker	s	fabricante
man	s	hombre
manufacture	v	fabricar
manufacturing	adj	manufacturero
many	adj	muchos/as
mark	s	marca, símbolo
mass	s	masa
mathematical	adj	matemático (mathematically = matematicamente)
matter	s	materia
may	v. modal	puede que
me	pron obj	me, mi

measure	v	medir		
mechanical	adj	mecánico		
medium	s	medio		
meet	v	reunir, encontrar, satisfacer (irreg. met, met)		
mention	v	mencionar		
middle	s	mitad	adj	medio, central
minimize	v	reducir, minimizar		
mix	v	mezclar		
mixture	s	mezcla		
mobile	adj	móvil		
mode	s	modo		
modulus	s	módulo		
mole	s	mol		
monoxide	s	monóxido		
more	adj	más	adv	más
mostly	adv	principalmente		
mountainous	adj	montañoso		
moving	adj	móvil		
much	adj	mucho		
muscle	s	músculo *muscle power : tracción a sangre*		
must	v. modal	deber		

N

narrow	adj	angosto		
need	v	necesitar	s	necesidad
new	adj	nuevo		
next	adj	próximo, siguiente		
note	v	notar, observar	s	nota
notice	v	notar, observar	s	nota, anuncio
nucleus	s	núcleo		
numeral	s	numeral		
numeric	adj	numérico		
numerical	adj	numérico		

O

obtain	v	obtener
occupy	v	ocupar
occur	v	ocurrir, producir/se
of	prep	de
of course	expr	por supuesto
often	adv	a menudo
oil	s	aceite, petróleo
old	adj	viejo
on	prep	sobre, en
only	adv	solo, solamente
operate	v	operar, funcionar, hacer funcionar
operating	adj	operativo
or	conj	o
over	prep	sobre
oxide	s	óxido

P

pair	s	par
paper	s	papel

paragraph	s	párrafo		
parentheses	s	paréntesis		
particle	s	particula		
particular	adj	particular		
pass	s	pase	v	pasar
passage	s	pasaje		
passive	adj	pasivo		
pattern	s	patrón, modelo		
people	s	gente, personas, pueblo		
per	prep	por		
petroleum	s	petróleo		
phase	s	fase		
phenomenon	s	fenómeno		
physics	s	física		
piano	s	piano		
picture	s	figura, cuadro, película		
pipe	s	caño		
place	v	colocar	s	lugar
plane	s	plano, avión (airplane)		
point	s	punto		
pole	s	polo, poste		
pollution	s	polución		
population	s	población		
pound	s	libra (450 gr); abrev lb		
powder	s	polvo		
power	s	potencia, poder		
practice	s	práctica	v	practicar
prefer	v	preferir		
present	adj	presente	s	presente
press	v	presionar, oprimir, apretar, prensar	s	prensa
pressure	s	presión		
previous	adj	previo		
principle	s	principio		
print	v	imprimir		
process	s	proceso		
processing	s	procesamiento		
property	s	propiedad		
psia	abrev	pounds per square inch absolute = libras por pulgadas cuadrada absoluta		
pull	v	tirar	s	tiro
pump	s	bomba	v	bombear
purify	v	purificar		
purpose	s	propósito, aplicación		
push	v	empujar	s	empuje

Q

quantity	s	cantidad		
quotation marks		comillas		
quote	s	comilla	v	citar

R

radio	s	radio		
radius	s	radio (de una circunferencia)		
rail	s	riel		
range	v	oscilar, variar		

rate	s	velocidad, ritmo, tarifa, índice	v	clasificar, tasar		
ratio	s	cociente, relación				
ray	s	rayo				
recommend	v	recomendar				
recycle	v.	reciclar				
reduce	v	reducir				
refer (to)	v	referirse, mencionar				
refine	v	refinar				
region	s	región				
reject	v	rechazar				
relationship	s	relación				
release	v	liberar				
remain	v	permanecer				
remark	s	acotación, comentario				
require	v	requerir				
requirement	s	requisito				
reserve	s	reserva	v	reservar		
resource	s	recurso				
restrict	v	restringir				
result	s	resultado	v	resultar		
return	v	volver	s	retorno		
revenue	s.	ganancia				
revolution	s	revolución				
right	s	derecha, derecho	adj	derecho, correcto		
roll	v	rodar				
roof	s	techo				
rotating	adj	rotativo				
row	s	fila				
rule	s	regla				
run	v	correr, ejecutar, hacer funcionar, andar (irreg. ran, run)	s	recorrido, tramo		

S

same	adj	mismo, (the same as = lo mismo que)				
sample	s	muestra				
scope	s	alcance				
score	s	puntaje	v	tener puntaje		
screen	s	pantalla				
section	s	sección				
sector	s	sector				
see	v	ver (irreg. saw, seen)				
segregate	v	segregar				
seldom	adv	rara vez				
select	v	seleccionar				
self-explanatory	adj	auto-explicativo				
semicolon	s	punto y coma (;)				
send	v	enviar (irreg. sent, sent)				
separate	v	separar				
separator	s	separador				
server	s	servidor				
service	s	servicio				
set	s	juego, equipo, aparato, conjunto	v	colocar, fijar		
settling	s	decantación, asentamineto				
several	adv	varios				
sheet	s	hoja, lámina, chapa				
shift	v	cambiar, conmutar	s	cambio, turno		

short	adj	corto, bajo		
show	v	mostrar (irreg. showed, shown)	s	espectáculo
sign	s	signo, cartel	v	firmar
signal	s	señal		
simplicity	s	simplicidad		
simply	adv	simplemente		
since	conj	dado que, ya que	prep	desde
single	adj	único		
size	s	tamaño, talle		
sky	s	cielo		
slash	s	barra		
slide	v	deslizar/se (irreg. slid, slid)	s	deslizamiento
slow	adj	lento		
small	adj	pequeño		
smoke	s	humo		
solar	adj	solar		
some	adj	algunos/as		
sometimes	adv	algunas veces		
source	s	fuente		
space	s	espacio	v	separar
speaking	s	habla		
species	s	especie, clase		
specimen	s	espécimen, probeta		
stack	s	chimenea		
stage	s	etapa		
stand for	v	representar, significar		
standard	adj	normal, común	s	norma
statement	s	enunciado, oración		
station	s	estación (power station = estación eléctrica)		
steam	s	vapor (de agua)		
steel	s	acero (stainless steel = acero inoxidable)		
step	s	paso	step by step = paso a paso	
stop	v	parar, detener	s	parada
strain	s	deformación	v	estirar, tensar
stress	s	esfuerzo, tensión	v	someter a esfuerzo
string	s	cadena (en computación), cuerda		
structure	s	estructura		
study	v	estudiar	s	estudio
style	s	estilo		
subject	v	someter	s	sujeto, tema, materia
such	adj	tales, dichos. En singular: such a = tal, dicho		
suitable	adj.	apropiado/a/os/as		
sulfur	s	azufre		
supply	s	suministro, fuente		
support	v	soportar	s	soporte
suppose	v	suponer		
surface	s	superficie		
surround	v	rodear, circundar		
switch	s	interruptor (llave)		

T

table	s	mesa, tabla (numérica)
take place	v (expr)	tener lugar, ocurrir
take	v	tomar, llevar (irreg. took, taken)
takeoff	s	despegue (aviación)

tall	adj	alto		
task	s	tarea		
technique	s	técnica		
tell	v	decir (irreg. told, told)		
tensile	s	tensión, tracción		
term	s	término, plazo		
terrain	s	terreno		
test	s	ensayo, prueba	v	ensayar, probar
text	s	texto		
than	conj	que (en comparativos)		
that is	expr	es decir		
that	adj dem	ese, esa, aquel, aquella	pron	eso, aquello , que
the	art	el, la, los, las		
them	pron obj	los, las, les, ellos, ellas		
then	adv	luego, entonces	conj	entonces, en ese caso
theoretical	adj	teórico		
there are	v	hay (presente del verbo “there be” usado delante de formas plurales)		
there is	v	hay (presente del verbo “there be” usado delante de formas singulares)		
thermal	adj	térmico		
thermodynamics	s	termodinámica		
these	adj dem	estos, estas	pron	éstas, estos
thick	adj	grueso, espeso		
thin	adj	delgado		
this	adj dem	este, esta	pron	esto
those	adj dem	esos, esas, aquellos, aquellas	pron	aquellos, aquellas
through	prep	a través de		
throughout	adv	completamente, por todos lados	prep	por todo, en todo
thus	adv	así		
tie	v	atar, ligar		
time	s	tiempo, hora, vez, momento		
to	prep	a, hacia, para		
today	adv	hoy		
tomorrow	adv	mañana	s	mañana
ton	s	tonelada		
tool	s	herramienta		
tooth	s	diente		
top	s	parte superior		
topic	s.	tema		
toward	prep	hacia		
transfer	s	transferencia	v	transferir
transform	v	transformar		
transportation	s	transporte		
try	v	probar, intentar		
tube	s	tubo		
two	num	dos		
type	v	escribir (a máquina), tipear	s	tipo

U

under	prep	bajo, debajo de		
understand	v	entender		
uniform	s	uniforme		
unimportant	adj	no importante, sin importancia		
until	conj	hasta	prep	hasta
upper	adj	superior		
uranium	s	uranio		

us	pron obj	nos, nosotros, nosotras		
use	s	uso		
useful	adj	útil		
user	s	usuario		

V

value	s	valor		
variable	s	variable	adj	variable
vast	adj	vasto		
very	adv	muy		
vessel	s	recipiente, vasija, navío		
visualize	v	visualizar		
voltage	s	tensión (voltaje)		

W

want	v	querer		
was	v	pretérito del verbo to be (pasado de am, is)		
water	s	agua		
waterwheel	s	rueda hidráulica		
way	s	modo, manera, vía, camino		
week	s	semana		
weight	s	peso, pesa		
well	s	pozo	adv	bien
were	v	pretérito del verbo to be (pasado de are)		
what	pron rel	lo que,	pron interr.	qué, cual
when	adv	cuando	pron interr.	cuando
where	adv	donde, adonde		
which	pron	que, el cual/la cual	pron interr	cuál
wire	s	cable, alambre		
wish	v	desear	s	deseo
with	prep	con		
without	prep	sin		
woman	s	mujer		
word	s	palabra		
work	v	trabajar, funcionar	s	trabajo
world	s	mundo		
write	v	escribir (irreg. wrote, written)		

Y

yesterday	adv	ayer
your	adj pos	su (de Ud., de Uds.)

LISTA DE VERBOS IRREGULARES DEL MÓDULO

PRESENTE	PRETÉRITO	PARTICIPIO PASADO	SIGNIFICADO
become	became	become	hacerse, volverse, convertirse
begin	began	begun	empezar
break	broke	broken	romper
bring	brought	brought	traer
burn	burned, burnt	burned, burnt	quemar-se
buy	bought	bought	comprar
choose	chose	chosen	elegir
come	came	come	venir
do	did	done	hacer
draw	drew	drawn	dibujar, extraer, trasfilar
fall	fell	fallen	caer-se
find	found	found	encontrar
forget	forgot	forgotten, forgot	olvidar-se
get	got	got, gotten	obtener, conseguir, etc.
give	gave	given	dar
go	went	gone	ir
grow	grew	grown	crecer
have	had	had	tener
hold	held	held	mantener, fijar
keep	kept	kept	mantener, conservar
know	knew	known	saber, conocer
learn	learned, learnt	learned, learnt	aprender
leave	left	left	salir, dejar
make	made	made	hacer
meet	met	met	reunir-se, encontrar-se
put	put	put	poner, colocar
run	ran	run	correr, ejecutar, hacer funcionar
see	saw	seen	ver
send	sent	sent	enviar
show	showed	shown, showed	mostrar
slide	slid	slid, slidden	deslizar-se
take	took	taken	tomar, llevar
teach	taught	taught	enseñar
tell	told	told	decir (a)
think	thought	thought	pensar
understand	understood	understoood	entender
write	wrote	written	escribir; “write down”:anotar