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English for Electrical Engineers

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UNIT 7A Describing an Experiment

1. Discuss the following questions.

- How can you create electricity using a fox tail?
- What else do you need?
- What is the proof that there is some voltage?

2. How would you describe the experiment above? In your description include: materials, steps, the description of the experiment and results.

3. Study the materials for a "lemon battery" experiment. How would you use the materials? Describe the experiment as if you were demonstrating it, and state the results.

Materials:

- 2 coins of different materials
- a multimeter
- a lemon
- a knife
- 2 crocodile clips

If you are not sure about the experiment, read on:

Steps / Procedure:

Use a knife to cut two slits into the lemon.
Put the coins halfway into the little slits.
Take a positive lead and connect it to the first coin.
Take a negative lead and connect it to the other coin.

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Notes

Use **imperative** to describe the method/steps. (i.e. How the experiment should be carried out.)

Put the coins into the little slits.

Sometimes **purpose** needs to be expressed:

Use a knife to cut two slits into the lemon.

Squeeze the lemon so that the voltage can go up.

To describe the experiment itself (its demonstration) use the **present simple tense (active or passive) or will future** (i.e. say what is done, what happens or what will happen). **Conditionals** are also used, e.g., When/If …, … the thing (happens/will happen).

When/If the lemon is squeezed, you will get more juice.

To report on the procedure and results of experiments, use the **past simple tense (active or passive)**. *Some voltage and current were measured.*

4. Read the experiment description and results. Use the verbs in brackets in a correct form.

The coins are touching the inside of the lemon and the crocodile clips _____ (connect) to the coins. This makes a connection which _____ (carry) electricity up through the lead and some conduction occurs. This conduction can _____(check) with a multimeter to determine whether the inside of the lemon is a good electrolyte and _____ (conduct) a current. If the lemon _____ (squeeze), more juice _____ (produce) and the voltage _____ (go) up. More current can then _____ (register).

Lemons act as batteries because they _____(contain) acid, which _____(help) conduct electricity. This is the reason why we _____(use) acid in batteries.

5. Now describe the results of the experiment in greater detail.

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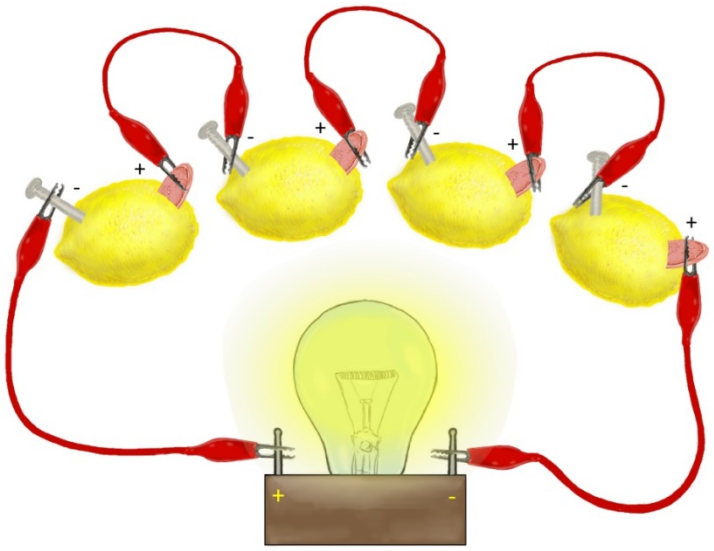
6. Complete the sentences with the correct form of the verbs in brackets. Sometimes there is more than one possibility.

1) If a magnetic field _____ (create), ferrous objects _____ (attract) to the metal rod.
2) When water _____ (reach) 100°C, it _____ (boil).
3) When lowering the voltage, the current in the cables _____ (decrease).
4) Press the red button so that the circuit _____(deenergize).
5) The resistance indicated by the multimeter _____(note).
6) What happened to the lemon battery during the experiment?
   It_____(discharge).
7) Check the protective equipment to _____ (make sure) everybody will be safe.

7. Go through the list of materials needed for a lemon battery experiment. Work in pairs and describe the experiment as if you were demonstrating it. Then describe the results.

<u>Materials:</u>

- 4 lemons
- 4 copper coins
- 4 zinc nails
- 5 crocodile clips
- 1 LED bulb
- a knife



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UNIT 7A Expressing Purpose

- *Take a knife so as to cut two slits into the lemon.*
- *Use different metals in order to make the experiment more interesting.*
- *Leave some distance between the coins so that they do not touch.*
- *Squeeze the lemon so that the voltage can go up.*
- *We drove fast in order to catch the train.*
- *We drove fast so as not to miss the train.*
- *They increased the price so that they made more profit.*
- *She went to the shop to buy a new smart phone.*

We use a purpose clause when we want to state the purpose of an action.

The most common type of purpose clause is a **to-infinitive clause**: ***(not) to, in order (not) to, so as (not) to.***
It is used ONLY if the subject of the main and subordinate clause is the same.
I'm going to the library ***to*** *get some technical books for the coming examination period.*
Take a knife ***so as to*** *cut two slits into the lemon.*
Use different metals ***in order to*** *make the experiment more interesting.*
Do the experiment twice ***in order to*** *verify the results.*
He spoke quietly ***so as not to*** *be heard by everyone.*
Note: In formal writing, ***in order to*** is often used, and ***so as to*** less frequently.

For present and future situations the following modals (and auxiliary verbs) can be used after *so, so that, in order that* (for intentions and ability):
Positive:
Squeeze the lemon ***so that*** *the voltage* ***can/may/will*** *go up.*
Do the work now ***so that*** *you* ***can*** *relax later.*
We keep the window open ***so that*** *the air* ***will*** *circulate.*
They study hard ***in order that*** *they* ***may*** *succeed.(rare)*
Negative:
Leave some distance between the coins ***so that*** *they* ***do not*** *touch.*
Remove the coins ***so that*** *the lemon* ***won't*** *be live any more.*
Leave early ***so that*** *you* ***won't/don't*** *miss the bus.*
We work hard during the week ***so that*** *we* ***don't*** *have to work at the weekends.*
The teacher provides notes ***in order that*** *the students* ***won't*** *have to take notes.*

For past situations the following modals (and auxiliary verbs) can be used after *so, so that, in order that*:
Positive:
The lemon was squeezed ***so that*** *the voltage* ***could/might/would*** *go up.*
We did the work quickly ***so that*** *we* ***could*** *relax later.*
We kept the window open ***so that*** *the air* ***would*** *circulate.*
They studied hard ***in order that*** *they* ***might*** *succeed.*

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Negative:
*Dr Schwarz gave out copies **so that** the students **wouldn't** have to take notes.*
*I hurried so that I **wouldn't** be late.*
*Some distance was left between the coins **so that** they **did not** touch.*
*They left early **so that** they **wouldn't** miss their bus.*
*They locked the cages **in order that** the animals **couldn't** escape.*

In an informal style, ***that*** can be dropped after ***so;*** this is very common in American English.
*I am going to explain some of the new procedures to you **so** you can understand them.*

1. Complete the sentences.

a. He spoke slowly _____ we could understand him.
b. I will come with you _____ help you.
c. Linda has turned on the lights_____ she can see better.
d. We are going to the cinema_____ watch a horror film.
e. He sat quietly _____ disturb anyone.
f. You must take your umbrella _____ you won't get wet.
g. I'm going to the canteen _____ get something to eat.
h. John switched on the printer _____ print out his assignment in German.
i. He waited at the counter _____ see her.
j. We all put on warm clothes_____ we wouldn't feel cold.

2. Make the two sentences one.

a. Let's go now. We want to catch the train. (so that)
b. The student studied really hard. He did not want to get bad marks. (in order not to)
c. He took his camera. He wanted to take some photos of the experiment. (so that)
d. Meggie learns English. Her aim is to get a job with an international company. (to)
e. He raised his arms. He needed to defend himself. (so that)
f. I've made big money. I will buy a new car. (in order that)
g. I will give you a map. You will find the way. (so that)
h. Many people left China. They wanted to find jobs in other countries. (so as to)
i. He opened the window. He wanted to let fresh air in. (in order to)
j. She was invited to the product demonstration. They wanted to show her how the demonstration was organized. (to)

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UNIT 7A Key

1.

Sample answers

a. He spoke slowly so that/in order that/so we could understand him.
b. I will come with you to/in order to/so as to help you.
c. Linda has turned on the lights so that/in order that/so she can see better.
d. We are going to the cinema to/in order to/so as to watch a horror film.
e. He sat quietly not to/in order not to/so as not to disturb anyone.
f. You must take your umbrella so that/in order that/so you won't get wet.
g. I'm going to the canteen in order to/so as to/to get something to eat.
h. John switched on the printer to/so as to/in order to print out his assignment in German.
i. He waited at the counter to/in order to/so as to see her / in order that he could see her.
j. We all put on warm clothes so that/in order that/so we wouldn't feel cold.

2.

Sample answers

a. Let's go now so that we can/will catch the train.
b. The student studied really hard in order not to get bad marks.
c. He took his camera so that he could/might take some photos of the experiment.
d. Meggie learns English to get a job with an international company.
e. He raised his arms so that he could/might defend himself.
f. I've made big money in order that I can/may buy a new car.
g. I will give you a map so that you can/will find the way.
h. Many people left China so as to find jobs in other countries.
i. He opened the window in order to let fresh air in.
j. They invited her to the product demonstration to show her how it was organized.

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Vocabulary Unit 7A

ability	schopnost
aim	cíl
assignment	zadaný úkol
acid	kyselina
boil	vařit
bulb	žárovka
cage	klec
carry	nést
carry out	provádět
catch	chyttit
check out	zkontrolovat
clause	věta
clip	svorka
clockwise	ve směru hodinových ručiček
coin	mince
conduct	vést
conduction	vedení
connect	spojit
contain	obsahovat
copper	měď
counter	pult
create	tvořit, vytvářet
crocodile clip	svorka
current	proud
cut	řezat
defend	bránit
demonstration	předvedení
describe	popsat
description	popis
determine	určit
distance	vzdálenost
disturb	rušit
electricity	elektřina
electrolyte	elektrolyt
escape	uniknout
experiment	pokus
following	následující, plynoucí z

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force	síla
fox	liška
fresh	čerstvý
funnel	trychtýř, nálevka
gauge	měřidlo
happen	dít se
hurry	pospíchat
increase	zvýšit
indicate	ukazovat
in order that	aby
in order to	aby
inside	uvnitř, vnitřek
intention	záměr
juice	šťáva
knife	nůž
lead	vést, olovo
leave	nechat
live	pod proudem / pod napětím
LED light emitting diode	
library	knihovna
light	světlo
mark	známka
measure	měřit
metal	kov
method	způsob, metoda
multimeter	multimetr
nail	hřebík
note	poznámka, poznamenat si
occur	objevit se
pressure	tlak
procedure	procedura, postup
proof	důkaz
provide	poskytovat
purpose	účel, záměr
raise	zvednout
reach	dosáhnout
reason	důvod
register	zaregistrovat, pozorovat
remove	odstranit
report	zpráva
resistance	odpor

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result	výsledek
rod	tyč
slit	zářez
so that	aby
so as to	aby
succeed	uspět
specimen	druh
spin	točit se
squeeze	zmáčknout
step	krok
stretch	natáhnout
tail	ocas
take notes	psát si ppoznámky
the same	stejný, ten samý
to	aby
touch	dotknout se
turn on	rozsvítit
twice	dvakrát
umbrella	deštník
verify	ověřit
vessel	nádoba, plavidlo
voltage	napětí
wet	vlhký
whether	zda, jestli
zinc	zinek

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UNIT 7B Writing an Abstract

1. Answer the questions.

1) What is an abstract?
2) When do you need to write an abstract?

2. Listen to a student reading the abstract written for his report on his seminar research project. Then, in small groups, discuss the following questions:

1) What is the main topic of the report?
2) What is the main objective of the research?
3) What are the basic hypotheses?
4) What are the methods used?
5) How do the results relate to the main hypotheses?
6) What follows from the research?

3. Look at the basic structure of an abstract.

An abstract is a very brief summary of a research paper, article, thesis or dissertation. It is also used when applying to present a paper at a conference.

Structure

1. Project title
2. Aim/purpose of the research (motivation, importance, relevance, possibly what is known and not known; max. 2-3 sentences)
3. Hypothesis (research expectations)
4. Methods (overview of experimental procedures, variables tested)
5. Summary of results (brief overview of the main results)
6. Conclusion (comment on importance of findings, limitations, implications, further research; 1-2 sentences)

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4. Read the research report below and answer the following questions:

1) Why was the research done?
2) What new feature does the research bring to the system being developed?
3) What are the results?
4) What is the main problem?
5) Is the product suitable for mass production?

THE DESIGN AND DEVELOPMENT OF A SOLAR-POWERED REFRIGERATOR[1]

This research report describes work on the development of a solar-powered refrigeration system which will eventually lead to the production of a village ice-maker or a cold storage unit for food preservation. The present study is part of a project in solar energy utilization, aimed at the development of one or more prototype units demonstrating the usefulness and economic viability of solar energy for refrigeration purposes. It is expected that such refrigeration units will be useful in developing countries where there is no effective electricity grid.

A small ammonia-water intermittent absorption refrigerator with a 1.44 m2 flat-plate solar collector has been tested as a first step towards the development of a village ice-maker. No oil or electricity is used. Regeneration takes place during the day and refrigeration at night. Rapid absorption is obtained by means of a new feature, first proposed by Swartman, in which the heat of absorption is dissipated from the flat plate.

In the generator, 15 kg of solution containing 46% ammonia in water are used. On a clear day, the solution temperature rises from 30oC to 88oC and 0.9 kg of pure ammonia is condensed at 32oC. During refrigeration, the temperature of the ammonia drops to -7oC. The estimated overall solar coefficient of performance (cooling effect divided by solar heat absorbed) is 0.09, which, though small, is comparable to previously published work.

Although the system has worked, the cooling ratio and the solar coefficient of performance are still low. It is difficult to control heat losses in the system. However, there were no difficulties in the refrigeration process in this system. The absorption process was completed within two hours and the formation of ice on the outer surface of the evaporator took half an hour

The new feature by which ammonia vapour from the evaporator is taken to the bottom header of the generator, so that the heat of absorption during the refrigeration process is dissipated from the flat plate, has been shown to remove the difficulty encountered by previous researchers of obtaining sufficiently rapid absorption for satisfactory operation.

The objective in making this experimental unit was merely to demonstrate the refrigeration effect produced from solar energy, and to gain practical experience; no attempt was made to optimize the performance of the system or to minimize the cost.

[1] Adapted from http://www.appropedia.org/The_Design_and_Development_of_a_Solar_Powered_Refrigerator

5. Read the text again and write a short abstract of the research report.

6. Study the information about a research project on XYZ bicycle helmet testing. Write an abstract related to the project.

TITLE: Safety of the XYZ Bicycle Helmet
INTRODUCTION, PURPOSE: helmets important: prevent serious head and brain injuries; to ensure the certified quality: helmets tested
OBJECTIVE: to prove the quality of the XYZ helmet
HYPOTHESIS: the helmet will meet safety standards for shock resistance
METHOD: impact test performed in Snell's California helmet testing laboratory; helmet dropped from the height of 2 m; acceleration not more than 200 G's
RESULTS SUMMARY: the helmet successfully withstood the shock; the impact test result confirms the hypothesis
CONCLUSION: the XYZ helmet has the required quality regarding shock resistance; the roll-off test will be performed soon

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1 Unit 7B Task 2

Abstract

The research described in this report is focused on the efficiency of solar panels. As solar panels must be very efficient in order to be cost effective, it is important to determine what configuration of panels is most efficient. The efficiency of solar panels is rated by measuring what percentage of sunlight hitting a panel is converted to usable electricity. The higher the efficiency, the less surface area is needed for the panels.

In this laboratory experiment, three independent variables were considered: the angle of the solar panels in relation to the light source, the surface area of the panels tested, and the configuration of panels, i.e. one large panel vs. several smaller linked panels. All of these factors were limited by laboratory conditions. Working hypotheses were: 1) panels directly facing the light source would be more efficient than those at another angle, 2) larger panels would be more efficient than smaller ones, and 3) one large panel would be more efficient than several smaller ones linked together. Measuring amps and volts in these experimental conditions produced the following results. As expected, panels at a 90° angle to the light source were more efficient, and a larger panel was more efficient than a smaller one. Surprisingly, it was found that several smaller panels linked together produced more volts and usually more amps compared to one large panel with the same surface area. This last finding needs to be investigated further.

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UNIT 7B WRITING AN ABSTRACT

The general conventions (i.e. **generally accepted standards**) of an abstract are the following:

Structure: See Ex. 3 in Unit 7B

Language/style

1. Use formal academic/scientific writing style:
   - Do not use contractions
   - Do not use "I"
   - Use passive voice (especially when describing research methods/procedures)
   - Use the past tense (the research was done)
2. Do not include details, explanations and comments about the procedures that are, of course, in the longer work.
3. Avoid using many adjectives, adverbs or other unnecessary words. Do not repeat things.
4. Each part of the abstract should use the same order of points. E.g. results in the same order as the hypotheses given.

Length: usually 150-200 words; sometimes 150-250 words

Scientific journals and conference committees provide guidelines for the structure and length.

Useful Phrases in an Abstract

- This research report / presentation describes work on …
- The aim(s) / objective(s) / subject(s) of this research (project) / presentation …
- The specific objective of the project was to …
- The research was based on / aimed at …
- The research (project) on (the topic of) ... was undertaken / carried out to answer the question / demonstrate / gain / confirm the hypothesis that…
- The research was built on the following hypothesis / hypotheses …
- To prove the assumptions, the following tests / experiments were used …
- A test was performed / conducted / carried out to …
- … has been tested as a first step / has been used / has taken place
- The … process / experiment was completed within …
- The (analysis of the) results (obtained) show(s) / indicate(s) that…
- According to the data collected, …
- It follows from the results of the research that…
- As predicted, the results are comparable with previously published work.
- A new feature has been shown / demonstrated which ...

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Vocabulary Unit 7B

absorb	absorbovat
absorption	absorpce
abstract	výtah
academic	akademický
acceleration	zrychlení
accept	přijnout
according to	podle (koho, čeho)
adjective	přídavné jméno
adverb	příslovce
affect	ovlivňovat
aimed at	zaměřený na
ammonia	čpavek
analysis	analýza
angle	úhel
another	jiný, další
apply	žádat
article	článek
as expected	dle očekávání, jak bylo očekáváno
assumption	předpoklad, domněnka
attempt	pokus
avoid	vyhnout se
basic	základní
be based on	být založený na
bottom	dno
brain	mozek
brief	stručný
bring	přinést
by means of	pomocí, prostřednictvím
certified quality	certifikovaná kvalita
clear	jasný, čistý
clearly	jasně
coefficient	koeficient
collect	sbírat
comment on	komentovat
committee	výbor
comparable to	srovnatelný s
compared to	ve srovnání s
complete	kompletní, úplný

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conclusion	závěr
condense	srážet se
condition	podmínka
conference	konference
confirm	potvrdit
consider	vzít v úvahu, zvážit, posoudit, považovat
contractions	stažené tvary
convention	zvyk
convert	převést
cooling	chladicí
correspond to	odpovídat čemu
cost	peněžní náklady
demonstrate	ukazovat, demonstrovat, dokazovat
develop	vyvíjet, rozvíjet
developing countries	rozvojové země
development	rozvoj
difficult	obtížný
difficulties	potíže
directly	přímo
discover	objevit
dissertation	dizertace
dissipate	rozptýlit se, vytratit se
divided by	dělený
drop	upustit
during	během
efficiency	efektivita, účinnost (stroje) adj: efficient
encounter sth	narazit na, setkat se s
ensure	zajistit
especially	zvláště
estimate	odhadovat
evaporator	výparník
eventually	nakonec = finally
expect	očekávat
expectation	očekávvání
experimental	experimentální
explanation	vysvětlení
face	být natočený k, čelit
feature	vlastnost, prvek
findings pl.	zjištění (mn. č.)
flat	plochý
follow from	vyplývat

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food	jídlo	
formation	tvoření	
further	další	
gain	získat	
general	obecný	
generally	obecně	
grid	síť	
guidelines	pokyny	
hit	zasáhnout	
heat	teplo	
helmet	helma	
however	avšak	
hypothesis	hypotéza	pl: hypotheses
ice	led	
identify	určit, objevit	
impact	dopad	
implication	implikace	
importance	důležitost	
important	důležitý	
include	zahrnovat	
independent	nezávislý	
injury	zranění	
in relation to	ve vztahu k	
intermittent	občasný, přerušovaný	
journal	časopis	
laboratory	laboratoř	
limitation	omezení	
losses	ztráty	
low	nízký	
main	hlavní	
mass production	velkovýroba	
meet safety standards	splnit bezpečnostní normy	
merely	pouze	
method	metoda	
minimize	minimalizovat	
misleading	zavádějící	
motivation	motivace	
objective	účel, cíl	
obtain	obdržet	
of course	ovšem	
operation	fungování, chod	

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optimize	optimalizovat
order	pořádek
outer	vnější
overall	celkový
overview	přehled
paper	příspěvek
part	část
passive voice	trpný rod
percentage	procentuální počet
perform	provádět = carry out, conduct
performance	výkon
plate	deska, plát; talíř
point	bod, smysl
predict	předpovědět
present	prezentovat
preservation	uchování
prevent from	zabránit, předcházet, předejít, zamezit
previous	předcházející adv: previously
production	výroba
propose	navrhnout
prove	prokázat
publish	publikovat
pure	čistý, bez přísad
rapid	rychlý
rate	řazeny
ratio	poměr
refrigerator	lednice= fridge
regarding	týkající se
relate to	souviset s
relevance	důležitost
required	vyžadovaný, požadovaný
research	výzkum
researcher	vědec
rise, rose, risen	stoupat
safety	bezpečnost
satisfactory	uspokojivý
scientific	vědecký
sentence	věta
serious	vážný
shock	náraz
so-called	takzvaný

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solution	roztok; řešení
soon	brzy
source	zdroj
stick to	držet se čeho
storage	uložení
subject of the research	předmět výzkumu
successfully	úspěšně
sufficient	dostatečný adv: sufficiently
suitable	vhodný
summarize	shrnout n: summary
summary	shrnutí
surface	povrch
surprisingly	překvapivě
take place	konat se
take	trvat
temperature	teplota
test rig	zkušební zařízení
thesis	diplomová/disertační práce pl: theses
though	ač although = ačkoli
title	název, titul
topic	téma
towards	směrem k
undertake	podniknout
unnecessary	ne nutný
usable	použitelný
useful	užitečný
usefulness	užitečnost
utilization	upotřebení, použití
vapour	pára, výpar
variable	proměnná
viability	schůdnost, realizovatelnost = feasibility
village	vesnice
within	v rámci
withstand	vydržet

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Unit 8A Lasers

1. What do you know about lasers? Look at these illustrations which show laser applications. Can you identify them?

2. Do you know the origin of the word LASER?

3. What applications of lasers do you use / have you used?

4. What applications for lasers do you know about? List as many as you can.

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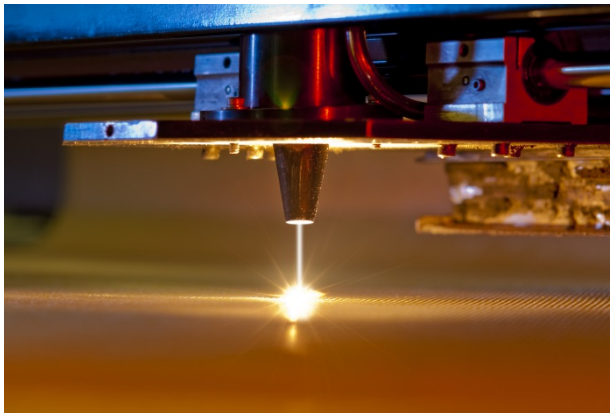
5. Read Text 1. Answer the questions.

a. **How is laser light different from regular light? Describe the basic characteristics of a laser.**
b. **What is the process called stimulated emission?**

Laser

A Light Amplification by Stimulated Emission of Radiation (LASER) is **a device used to stimulate atoms or molecules** to emit light at particular wavelengths and generate a monochromatic, intense and precisely directed beam of coherent light.

Atoms or molecules of gases, liquids, crystals, or other substances are used in lasers. They are excited in what is called the *laser cavity*, putting most of them at higher energy levels, while reflective surfaces in the cavity reflect energy and enable it to build up. Through a process called stimulated emission, photons with matching frequencies and phases are emitted. Emitted photons may then each strike other excited atoms, stimulating further emission of photons. This process produces a rapid chain reaction, discharging all the atoms and leading to the production of coherent light **escaping from the cavity.**



The first working laser was demonstrated in the USA in 1960. Since then, lasers have become a multi-billion dollar industry. Many different types of lasers have been developed, with varied characteristics. Lasers now range in size from small semiconductor lasers to solid-state and gas lasers as large as a building. Despite such variations, the light beam produced by most lasers is very thin and maintains its size and course over large distances. Once a laser beam travelling in a straight line collides with a particle which is large enough to interact with the light, it will reflect and spread in all directions like normal light.

6. Read Text 2. In the text, find examples of laser applications for each category and complete the rest of the table. You may also want to add extra applications.

Lasers have a variety of applications. **The most widespread function of lasers is the transmission and processing of information**. Lasers are an integral part of optical storage devices, such as compact disc and DVD players, bar code readers, scanners and laser printers. In telecommunications, fibre-optic systems transmit most telephone signals.

Precise delivery of laser energy is an important tool in industrial manufacturing, where **lasers are commonly used for cutting and boring materials** and for inscribing precise patterns in glass and metal. In medicine **laser beams are used for surgical removal of tissue**, for example to correct poor vision or for cosmetic purposes. Laser energy can be focused in space and concentrated in time so that it heats, burns away, or vaporizes materials. This technology is used in fusion research, nuclear weapons testing, and missile defence.

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Other common applications of lasers are alignment, measurement, and imaging. Lasers are used by the military for range finding, target identification and illumination for weapons delivery. **The function of a pulsed laser radar is to measure distance** by timing how long it takes a laser pulse to bounce back from a distant object. Surveyors and construction workers use laser beams to draw straight lines through the air. The coherence of laser light is crucial for interferometry and holography, which depend on interactions between light waves to make extremely precise measurements and to record three-dimensional images.

Transmission and processing of information	Delivery of laser energy	Alignment, measurement, imaging

7. Practise the expressions from Texts 1 and 2.

a. Find synonyms for the following words in Text 1:

Example: *materials – substances (line 4)*

fast
multi
kinds
different
direction

b. In Text 2, find synonyms for these words:

recorders
accurate
experiments
direct
pictures

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8. Match each expression in column A with an appropriate expression in column B.
Example: *laser printer*

A	**B**
reflective	reader
bar code	images
integral	device
laser	surface
light	part
three-dimensional	printer
storage	beam

9. Read the following sentences. Focus on the structures in bold which are used when we speak about functions of objects.

1. *A laser is a device **used to stimulate** atoms or molecules.*
2. *Lasers are commonly **used for** cutt**ing** and bor**ing** materials.*
   *In medicine, laser beams are **used for** surgical **removal** of tissue.*
3. ***The** most widespread **function of** lasers **is** the **transmission** and process**ing** of information.*
4. ***The function of** a pulsed laser radar **is to measure** distance.*
5. *Lasers **are for** cutt**ing** and holographic **projections**.*

10. Complete the gaps for each example. What is the grammatical difference between the structures?

1. **be used + _____ + _____**
2. **be used + _____ + _____**
   be used + _____ + _____
3. **The function _____ is + _____ / _____**
4. **The function _____ is + _____ + _____**
5. **be + _____ + _____ / _____**

11. Explain the function of the following objects using the structures above. If you are not sure, look back at Text 2.
Example: *Laser missiles:* *Laser missiles are used for defence.*

1. laser printer
2. compact discs
3. optical fibres
4. bar code readers
5. laser cutter
6. laser radar

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12. Make collocations with the word LASER and the following expressions. (The word LASER is placed before some of the expressions and after others.)

pointer
mixed-gas
spectrometer
technology
industry
high-precision

13. Work in pairs. Student A will look at file A and student B will look at file B.

File A: CD Player (plus unlabeled laser printer)

File B: Laser Printer (plus unlabeled CD player)

Student A: Explain the function of each CD player part to Student B. First explain where each particular component is located.

Student B: Explain the functions of each laser printer part to Student A. First explain where each particular component is located.

14. Design a laser controlled device for opening your classroom door. Draw and describe the device. In your description speak about the main components, their location and functions.

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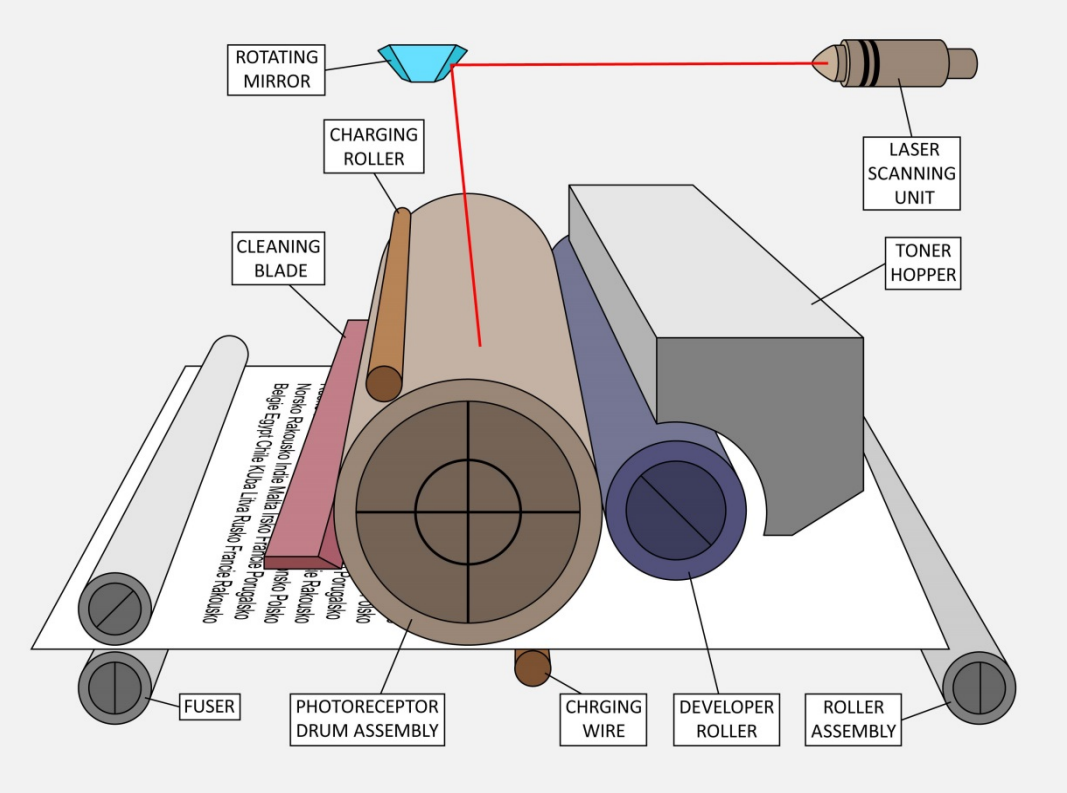
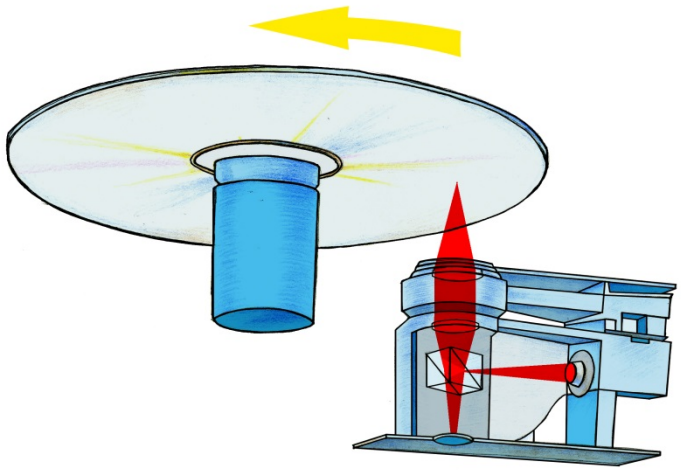
File A: Explain the function of each laser printer part. Ask your partner to explain the function of each CD player part.





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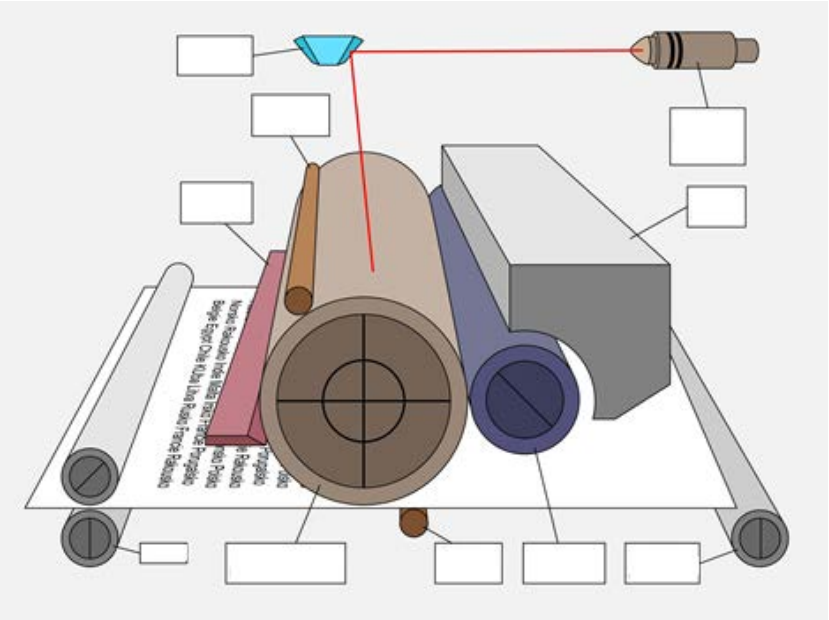
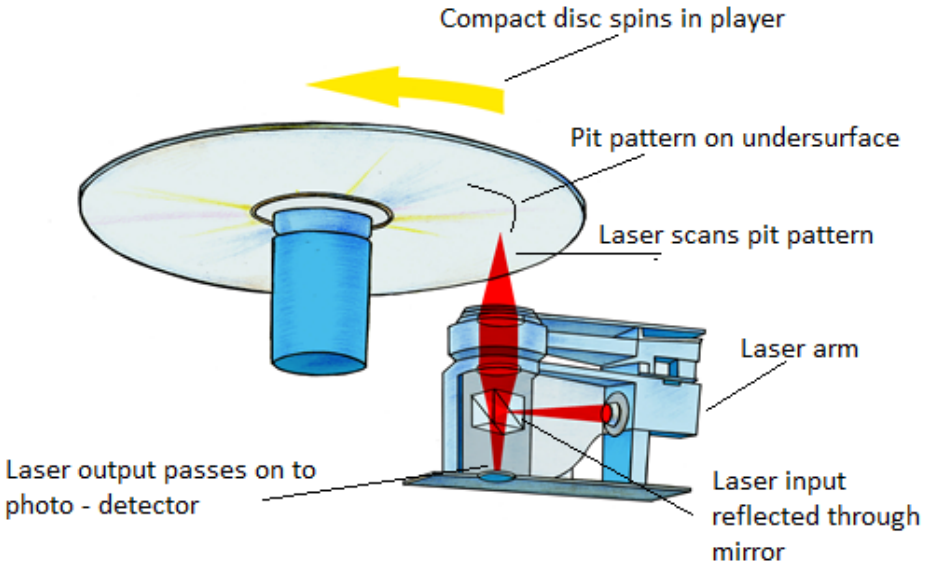
File B: Explain the function of each CD player part. Ask your partner to explain the function of each laser printer part.





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UNIT 8A Describing Function

The following are the structures for expressing function in English.

1) be used to + INF
   *Lasers **are** also **used to** enable automatic reading.*

2) be used for + -ing / noun
   *A barcode reader **is** a device **used for** scann**ing** barcodes.*
   *A barcode reader **is** a device **used for a scan** of barcodes.*

3) the function of ..... is + -ing / noun
   ***The function of** power lines **is** transmitt**ing** electricity.*
   ***The function of** power lines **is transmission** of electricity.*

4) the function of ..... is + to + INF
   ***The function of** a barcode **is to process** data.*

5) be for + -ing / noun
   *This laser **will be for** cutt**ing** materials.*
   *This laser **will be for cut** of materials*

1. Match each item in column A to its function in column B. Then link the two in sentences using all of the structures above.

1.	a current source	a.	provide communication
2.	an interface	b.	obtain specific data
3.	measurement	c.	deliver power to a load

2. Create a sentence using the structure indicated by the numbers above. Sometimes you can decide yourself (?).

Example: *a watch (4)*
The function of a watch is to show the time.

a. an assembly line (?)
b. an ohmmeter (2)
c. a DVD (5)
d. a voltage meter (3)
e. a printer (?)
f. an elevator (1)
g. a car (?)
h. a mobile phone (1)
i. a pen (4)
j. a laptop (?)

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UNIT 8A Key

1.
1c
2a
3b

A current source is used for delivering power to a load.
A current source is used to deliver power to a load.
A current source is for delivering power to a load.
The function of a current source is to deliver power to a load.
The function of a current source is delivering power to a load.

An interface is used for providing communication.
An interface is used to provide communication.
An interface is for providing communication.
The function of an interface is to provide communication.
The function of an interface is providing communication.

Measurement is used for obtaining specific data.
Measurement is used to obtain specific data.
Measurement is for obtaining specific data.
The function of measurement is to obtain specific data.
The function of measurement is obtaining specific data.

2.
Sample answers

a. The function of an assembly line is to assemble products.
b. An ohmmeter is used to measure resistance.
c. The function of a DVD is to record data.
d. A voltage meter is for measuring voltage.
e. The function of a printer is printing.
f. An elevator is used for lifting people up.
g. A car is for travelling to work.
h. A mobile phone is used for making phone calls.
i. The function of a pen is to write.
j. A laptop is used to access the Internet.

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Vocabulary Unit 8A

accurate	přesný
add	dodat, přidat
air	vzduch
alignment	tarovnání
amplification	zesílení
appropriate	vhodný
arm	rameno, paže
assemble	montovat
assembly line	montážní linka
barcode reader	čtečka čárových kódů
beam	paprsek, trám
become	stát se
blade	list
bore	vrtat, soustružit
boring	řezání
bounce back	skočit odrazem zpět
burn away	shořet
cavity	dutina
charging	nabíjecí
cleaning	čistící
coherent	souvislý
collide	srazit se
collocation	slovní spojení
commonly	běžně
components	součásti
concentrated	soustředěný
construction	stavba
correct	opravit
course	kurz, směr
crucial	klíčový, rozhodující, zásadní
current	proud
cut, (cut, cut)	řezat, sekat
defence	obrana
deliver	doručit
delivery	doručení
depend on	záviset na

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despite	navzdory
device	zařízení
different	odlišný
direct	přímý, zamířit
directed	namířený
direction	směr
discharge	vybít
distance	vzdálenost
distant	vzdálený
draw	kreslit
drum	buben
elevator	výtah
emit	vydávat, vyzařovat, vysílat
enable	umožnit
enough	dost
escape	uniknout
exact	přesný
excite	nabudit, vzrušit
fibre	vlákno
fonfing	hledání
focus	zaměřit se na
gas	plyn
glass	sklo
heat	hřát
high-precision	vysoce přesný
hopper	zásobník
chain reaction	řetězová reakce
illumination	osvětlení
image	obrázek
imaging	zobrazení
industrial	průmyslový
industry	průmysl
inscribe	vpisovat
integral	nedílný
intense	intenzivní, silný, ostrý
interface	rozhraní
kind	druh
lead, led, led	vést
level	úroveň
lift up	zvedat
light	světlo

liquid	tekutina
load	zátěž
locate	určit pozici
location	umístění
manufacturing	výroba
matching	hodící se, odpovídající
measurement	měření
military	vojenský
mirror	zrcadlo
missile	střela
obtain specific data	získat specifické údaje
once	jakmile
origin	původ
output	výstup
particle	částice
particular	určitý, jednotlivý, specifický
pass on	předat, přesunout
pattern	vzor
phases	fáze, stadia, etapy
pit	jáma, důlek
player	přehrávač
pointer	ukazovátko
poor	špatný, chatrný, nedostatečný
power	síla, energie
power line	elektrické vedení, drát elektrického napětí
precise	přesný
precision	přesnost
process	proces, zpracovat
processing	zpracování
produce	produkovat
purpose	účel
range	rozsah, (být v) rozmezí, pohybovat se mezi
rapid	rychlý
record	zaznamenat, nahrát
recorder	přehrávač
reflect	odrážet
reflective	reflexní
regular	pravidelný
removal	odstranění
rest	zbytek
roller	válec

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semiconductor	polovodič
size	velikost
solid-state	v pevném stavu
source	zdroj
space	vesmír
spin	točit se
spread	šířit se
storage	uskladnění
straight	přímý
strike, struck, struck	narazit
substance	hmota, látka
such	takový
surface	povrch
surgery	operace, chirurgický zákrok
surgical	chirurgický
surveyor	zeměměřič, geometr
target	cíl
thin	tenký, hubený
three-dimensional	3D
through	skrz
timing	měření
tissue	tkáň
transmission	přenos
transmit	přenášet
unlabeled	neoznačený
vaporize	vypařit, odpařovat
variation	varianta, variace, změna, odchylka, rozdíl
varied	rozmanitý, různorodý, pestrý
variety	paleta, různost
vision	vidění, zrak
wave	vlna
wavelength	vlnová délka
weapon	zbraň
while	zatímco
widespread	rozšířený
wire	drát

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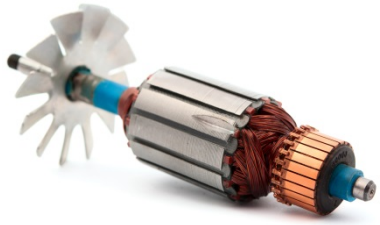
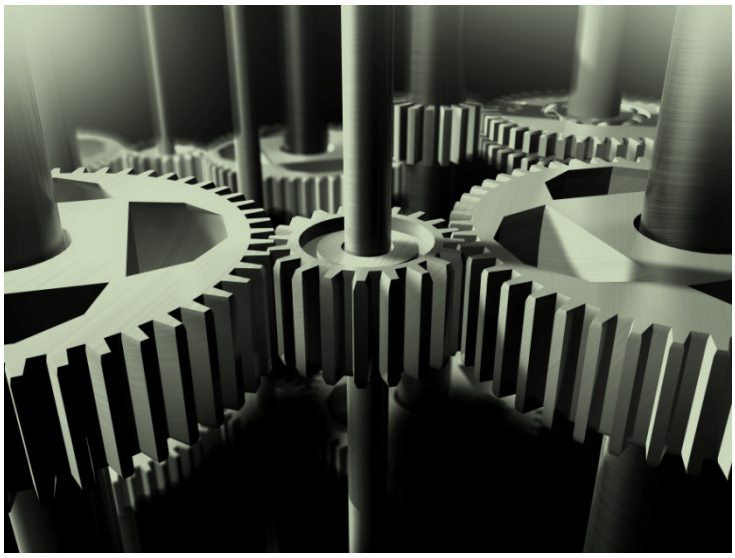
UNIT 8B How Does It Work?

1. In pairs, identify the part in the picture below and describe how it works.





2. You are going to hear three product descriptions. Your task is to listen and find out which product the person is talking about.

Product number 1:	Product number 2:	Product number 3:

a. Listen again and complete the tasks below. Answer the following questions:

1. Where is the part called the diaphragm located?
2. What converts into an auditory signal?
3. What kind of device is needed to hear the sound?

b. Decide whether the statements are TRUE (T) or FALSE (F):

1. Bats use a similar principle for their orientation. T X F
2. The device´s function is based on measuring the distance to and from the object. T X F
3. It can´t detect distant objects in the atmosphere. T X F

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c. Fill in the missing words.

The _____(1) device turns a _____(2) that converts the mechanical energy into electrical energy. The_____(3) parts of the device are a set of _____(4) that catch the moving fluid, a _____(5) or axle that rotates as the blades move, and some sort of machine that's _____(6) by the axle that powers an electric generator.

3. Read the description of a loudspeaker below. Fill in the gaps with the words from the box.

attached – cone – core – design – diameter – disc – field – inner – motor – produce – rapidly – wired

Loudspeakers[1]

A loudspeaker is a linear _____(1) with a small range. It has a single coil **that** is permanently **but** flexibly _____(2) to the voltage source, **so** there are no brushes.

Similar linear motors, **although** of course without the paper _____(3), are often used to move the reading and writing head radially on a _____(4) drive.

The coil moves in the _____(5) of a permanent magnet, **which** is usually shaped to _____(6) maximum force on the coil. **Moreover**, the moving coil has no _____(7), **so** its mass is small and it may be accelerated quickly, allowing for high frequency motion. In a loudspeaker, the coil is _____(8) to a lightweight paper cone, which is supported at the _____(9) and outer edges by circular, pleated paper 'springs'.

The speaker is sometimes beyond the normal upward limit of its travel, **so** the coil is visible above the magnet poles.

For low frequency, large wavelength sound, one needs large cones. The speaker shown is 380 mm in _____(10). Speakers designed for low frequencies are called woofers. They have large mass and are **therefore** difficult to accelerate _____(11) for high frequency sounds.

Tweeters - loudspeakers designed for high frequencies - may be just speakers of similar _____(12); **however**, with small, low mass cones and coils.

Downloaded from: http://www.animations.physics.unsw.edu.au/jw/electricmotors.html on 25th February 2012

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4. Read the text again and answer the following questions:

a. What is a loudspeaker?

b. What other applications does a linear motor have?

c. Why is there no core in the coil?

d. What is the difference between woofers and tweeters?

5. Study the underlined expressions carefully. Think about their use and complete the following TRUE OR FALSE QUIZ. Be ready to explain your opinion.

a. "Which" and "that" are synonyms in the text. **T x F**

b. We can also use them in the following sentence:
" *One person* _____ *patented a loudspeaker was Ernst Siemens*." **T x F**

c. "Although" expresses contrast. We can replace it by "even though." **T x F**

d. We can use the expressions "in spite of" and "despite" in a similar way. **T x F**

e. We use "moreover" to support or to add information to what has already been said. **T x F**

f. We can replace "moreover" by "furthermore", "in addition" and "nevertheless". **T x F**

g. "But" and "however" have a very similar meaning. **T x F**

h. We can always replace "so" by "therefore" and the other way around. **T x F**

6. Look at the sentences and fill in the gaps using one or more bold-printed expressions from Exercise 3. In some gaps, you can use more than one expression.

a. The sound system is quite obsolete; _____, it is still working well.

b. The company_____ you recommended to me hasn´t delivered any order on time.

c. _____ his young age, I am convinced that he is the person we are looking for.

d. Our new manager, _____ started to work here two months ago, has already fired ten employees.

e. The new wind turbine is more efficient. _____, it has a lower level of noise pollution.

f. _____ I used to be an ecological activist, I believe in nuclear power.

g. They have further developed the technology, _____ we will have to buy the new software.

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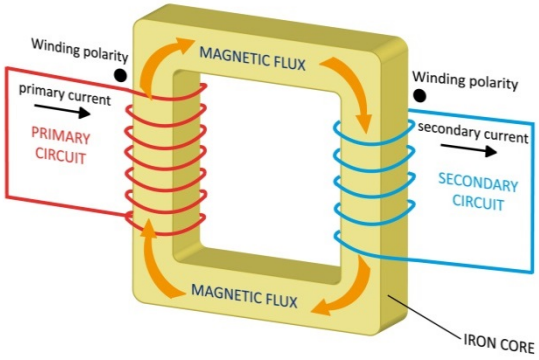
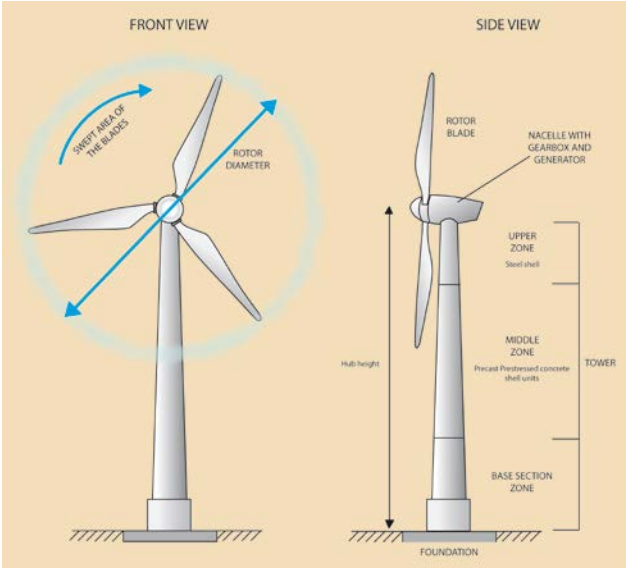
7. Look at the pictures below. Choose one of the diagrams and write a description of the device in the picture. Describe its parts; explain its use and working principle.





2 Unit 8B Task 2

1) **Product number 1[1]:** The device converts acoustic energy –sound waves– into electric energy – auditory signals. It is used to amplify sound. A piece of metal called the diaphragm, usually located within the head of the device, vibrates when the sound waves hit it. This starts a chain reaction wherein other components vibrate. These vibrations translate into auditory signals. Eventually, speakers will re-convert the auditory signals into the sound waves that we hear.

2) **Product number 2[2]:** The working principle of the device is similar to how a bat detects an object in its path. The bat sends out sound waves in the direction of its movement. The sound waves hit an object and then bounce back to the bat. The bat's ears receive the reflected sound. Based on the length of time it takes the sound waves to travel to and from the object in its path, the bat can efficiently determine when to swerve and avoid the object. In a similar way, the device's system sends out radio waves in all directions. By measuring the time it takes the radio waves to travel to and from an object within the device's range, it can detect faraway objects in the atmosphere and determine their position. The position can even be indicated on the screen.

3) **Product number 3[3]:** The machine is designed to capture some of the kinetic energy of the fluid and convert it into mechanical energy. This particular type converts the kinetic energy of moving water into mechanical energy. The spinning device turns a generator that converts the mechanical energy into electrical energy. The key parts of the device are a set of blades that catch the moving fluid, a shaft or axle that rotates as the blades move, and some sort of machine that's driven by the axle that powers an electric generator. Different kinds are used depending on the topography of the area, how much water is available and the distance over which it can be made to fall. The type is chosen carefully to extract the maximum amount of energy from the water.

[1] Adapted from: http://www.strategicresults.com/wiki/doku.php?id=Equipment:Microphones
[2] Adapted from: http://expertscolumn.com/content/how-does-radar-works
[3] Adapted from: http://www.explainthatstuff.com/turbines.html

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UNIT 8B Linking in an English Text

A. Relative clauses

Referring to people or to sth treated as a person (*e.g.*, robots, pets): ***who*** / ***whom***
Who is used as a subject and ***whom*** as an object of a sentence or clause.

Peter is the one ***who*** invited the Minister of Foreign Affairs.

*Lisa, **who** I have known for years, is our new manager.* (Notice commas because Lisa is unique and does not have to be identified by the relative clause.)

*The colleague **who** I wanted to see was away on holiday.* (No commas because the colleague is identified by the relative clause.)

Whom is considered quite formal. It is used only in very formal writing and when the preposition is in front of it at the beginning of the relative clause.

*The person **who** I wanted to see was away.*

*The person **whom** I wanted to see was away.* (formal)

*The person **who** I was talking to is my boss.*

*The person to **whom** I was talking is my boss.* (formal)

The possessive ***whose*** refers to both people and things.

*She is the person **whose** car was stolen last night.*

*That is the new book **whose** theme is so controversial.*

Referring to things, animals and groups of people: ***which / that***

*Where is the switch **that / which** you bought yesterday?*

*I never buy products **which / that** contain soya.*

*The meeting at 3 pm, **which** I was not going to attend anyway, will be cancelled.*

*This is the dog **that / which** saved my life.*

*My brother is in the team **that / which** won the tournament.*

*She belongs to an organization **which / that** specializes in work safety.*

That can also refer to people:

*Do you know anyone **that / who** speaks Chinese?*

*The man **who / that** has just left is a politician.*

You can leave out ***who / which / that*** when it is not a subject.

*She is the person **(who)** I wanted to see.*

*The decision **(which)** my boss made was very unpopular.*

*I want to buy the computer **(that)** I saw yesterday in the advert.*

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B. Expressing contrast

Although - Though - Even though
Although is formal. ***Though*** is informal. ***Even though*** is a bit stronger than ***although***.
Though/Although *I have a laptop and PC, I don't often use modern technologies.*
I don't often use modern technologies ***although*** *I have a laptop and PC.*
Even though *you dislike business trips, you should go to Germany next week.*

In spite of - Despite (prepositions)
In spite of/Despite *his bad mood, he went to the party.*

In spite of /despite cannot be followed by a clause. We can use ***in spite of the fact that/ despite the fact that...+ a clause.***
I work as a quality controller ***in spite of the fact that/despite the fact that*** *I am a physicist.*
= I work as a quality controller ***although*** *I'm a physicist.*
We went out ***in spite of/despite*** *the rain. = We went out* ***although*** *it was raining.*

However – Nevertheless
Nevertheless is more formal than ***however***. They can come in initial, mid or end position in a sentence. They are usually separated by commas.
I can understand everything you say. ***However/Nevertheless****, I am totally against it.*
We have been cooperating for years. It is, ***however****, necessary to find new suppliers now.*
It is necessary to find new suppliers now, ***however****.*
It is necessary, ***nevertheless****, to find new suppliers now.*

Whereas – While
Whereas is more formal than **while.**
English spelling is difficult, ***while/whereas*** *German spelling is easy.*
Whereas my brother Jan is tall, my brother Mirek is short.

Unlike – In contrast to
These are used before nouns as prepositions.
Unlike/In contrast to *the old type, the new type has many interesting features.*

C. Supporting or adding information

Moreover – Furthermore - In addition
Moreover is very formal; ***in addition*** is the least formal. Use commas to separate them.
PSP games are getting cheaper; ***moreover/furthermore/in addition****, their quality is improving.*

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1. Complete the sentences with a correct expression. Sometimes there is more than one option.

a. Cindy is the one _____ was chosen to represent our company at the trade fair.
b. We met some people _____house was robbed.
c. They represent an organization _____ protects birds.
d. The man _____ I'm waiting for is my best friend.
e. The trip to London, _____ she enjoyed very much, was quite expensive.
f. I do not like the project; _____, I will support it because we need it.
g. I enjoy reading political magazines._____, this one has good articles.
h. They did not need any help. _____, we sent them one thousand pounds.
i. The students didn't do their homework. _____, they failed the exam.
j. _____ the weather was nice, we decided to delay our trip.
k. The neighbourhood isn't very interesting. I like the house, _____.
l. _____ living in the same building, we hardly see each other.
m. She's extremely rich; _____, she's not snobbish.
n. That order isn't interesting enough for us, and _____, it's too expensive.
o. We have plenty of money; _____, we hope to finish the reconstruction soon.
p. _____ the fact that it was a windy and rainy night, I decided to go out.

UNIT 8B Key

a. Who, that
b. Whose
c. Which, that
d. Who, that (whom not usually used)
e. Which
f. However, nevertheless
g. Moreover, furthermore, in addition
h. However, nevertheless
i. Moreover, furthermore, in addition
j. Though, although, even though
k. Though, however, nevertheless
l. Despite, in spite of
m. However, nevertheless
n. Moreover, furthermore, in addition
o. However, nevertheless
p. In spite of, despite

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Vocabulary Unit 8B

a bit	trochu
accelerate	zrychlit
advert	inzerát
against	proti
allow for	dovolit
although	ačkoliv, přestože
amplify	zesílit
article	článek
attach	připojit
attend	navštívit
auditory	zvukový
available	dostupný
axle	osa, náprava
bat	netopýr
believe	věřit
belong	náležet
beyond	za
bird	pták
brush	kartáč(ek)
but	ale
cancel	zrušit
capture	zachytit
carefully	opatrně
catch	chytit
choose, chose, chosen	vybrat
circuit	obvod
circular	kulatý
coil	cívka
comma	čárka
cone	kužel, kornout
convert	převádět
convince	přesvědčit
core	jádro
decide	rozhodnout se
decision	rozhodnutí
delay	zdržet
despite	navzdory
detect	detekovat, zaznamenat, všimnout si

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diameter	průměr
diaphragm	membrána
dislike	nemít rád
distance	vzdálenost
drive	mechanika, řídit
ear	ucho
edge	okraj
efficient	výkonný
employee	zaměstnanec
enjoy	užít si
even though	ačkoliv, přestože
eventually	nakonec
expensive	drahý
express	vyjádřit
fall	padat
faraway	vzdálený
feature	char. rys, znak
field	pole
flexible	ohebný
fluid	tekutina, kapalina
flux	tok
force	síla, přinutit, donutit
foreign affairs	zahraniční záležitosti
foundation	základ, podklad
furthermore	navíc, mimoto
gearbox	řazení
head	hlava
hear	slyšet
however	avšak
improve	zlepšit
initial	úvodní
in spite of	navzdory, přes
in addition	navíc
in contrast to	na rozdíl od
initial	úvodní
inner	vnitřní
key	klíčový
large	prostorný, velký
leave out	vynechat
length	délka
level	úroveň

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lightweight	lehký
linking	spojování
look for	hledat
loudspeaker	reproduktor
magazine	časopis
mass	masa, hmotnost
meaning	význam
measuring	měření
mood	nálada
moreover	navíc
motion	pohyb
move	pohybovat se
movement	pohyb
nacelle	gondola
necessary	nutný
neighbourhood	sousedství
nevertheless	nicméně, avšak
noise	hluk
notice	všimnout si
object	předmět
obsolete	zastaralý
order	objednávka
path	cesta
person	osoba
pet	mazlíček
piece	kousek
physicist	fyzik
pleated	skládaný
plenty of	hodně
pollution	znečištění
possesive	přivlastňovací
power	pohánět
preposition	předložka
protect	chránit
quite	docela
radially	paprsčitě, hvězdicovitě
receive	získat, obdržet
recommend	doporučit
refer	odkazovat
relative clauses	vztažné věty
replace	nahradit

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rotate	otáčet se
safety	bezpečnost
screen	obrazovka
send out	poslat, vyslat
separate	rozdělit
shaft	hřídel
shape	tvar
shell	ulita, karoserie, krunýř
similar	podobný
single	jednoduchý, jediný
so	takže
sort	druh
sound	zvuk
spare	ušetřit
spinning	točitý, otáčející se
spring	pružina, péro
steal, stole, stolen	(u) krást
steel	ocel
subject	podmět
supplier	dodavatel
support	podepřít, podporovat
sweep, swept, swept	máchat, mávat, shrnout
swerve	zahnout, zatočit
switch	přepínač
that	který
the other way round	obráceně
theme	téma
therefore	tudíž
topography	mapování
trade fair	veletrh
treate	zacházet
trip	výlet
turbine	turbína
turn	měnit
unlike	na rozdíl od
upward	horní
usually	obvykle
weather	počasí
view	pohled
visible	viditelný
whereas	zatímco

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wherein	zatímco
which	který
while	zatímco
who	kdo
whose	čí
wind	vítr
winding	vinutí
without	bez

UNIT 9A Production Process

1. Who cleans up after a meal in your home? Who washes up? Do you have a dishwasher? Do you think having a dishwasher is a good idea?

2. Read the text below.

How a Dishwasher is Manufactured

Michael and Susan are showing the guests round the dishwasher assembly line. The words in bold represent the main parts of a dishwasher. Use them to label the picture below.

The major components of a dishwasher are made of steel and plastic. The basic structure consists of a steel frame assembly and a steel door panel. Sheets of stainless steel are purchased and formed into the required pieces and shapes in the factory; both the door and the wrap-around cabinet for standalone models are purchased as coiled sheet steel that has been prefinished in several standard colours. Other small steel parts are designed in house but made by suppliers to the manufacturer's specifications.

The **racks** that hold the dishes are also made of steel, but it is delivered to the factory as coiled wire. To coat the rack tines to prevent them from scratching dishes, the racks are dipped in plastic in the form of powdered polyvinyl chloride (PVC) or nylon.

The inner box that holds the racks and the washer arms is called the **tub**. It is a single piece that is injection-molded in the plant. The injection molding is done with pellets of calcium-reinforced poly-propylene plastic. This plastic is respected for its strength and for the fact that it is inert; that is, it won't react with chemicals like those in detergents and is resistant to water and heat. Many other parts, including the **basket for cutlery**, **containers for detergent**, and the **wash tower** and **spray arms,** are also injection-molded.

Motors, **pumps**, and electrical controls and components are made by subcontractors in accordance with designs by the dishwasher manufacturer.

Adapted from: http://www.enotes.com/how-products-encyclopedia/dishwasher

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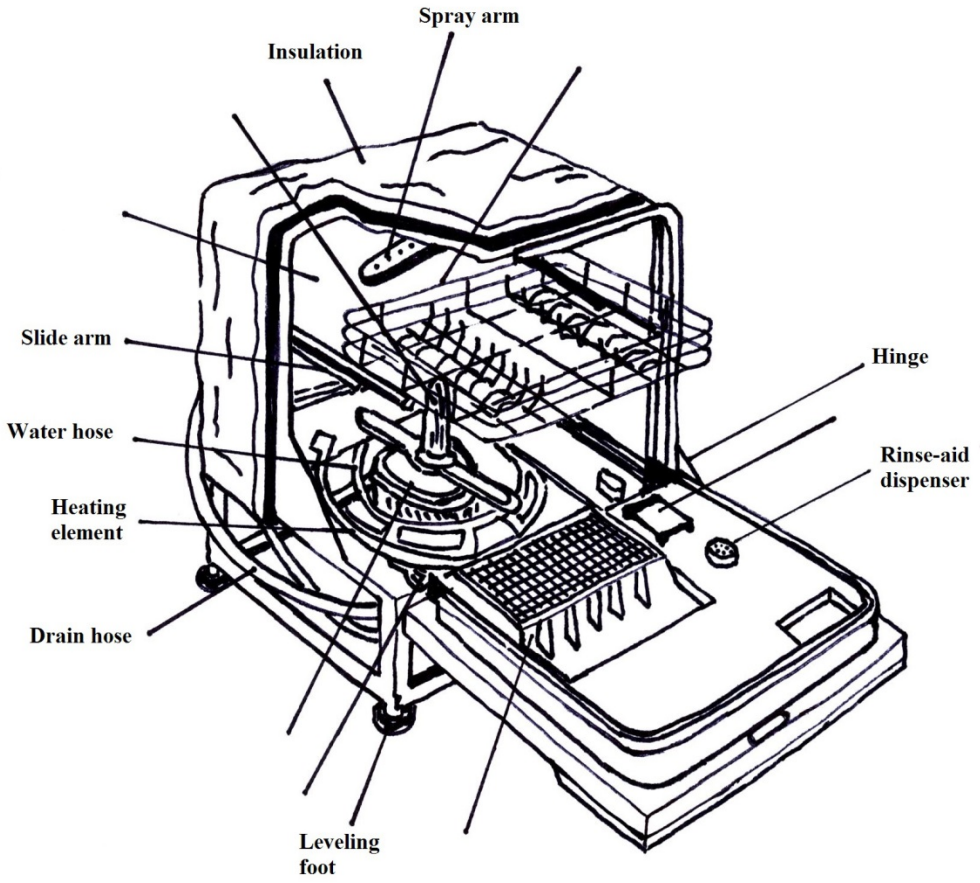

3. Answer the questions.

1. What are the major components of a dishwasher and what are they made of?
2. What is the function of a tub?
3. What are other parts of a dishwasher besides of the tub and racks?

Passive Voice
As you know, the passive voice is often used in technical English.

Examples:
The major components of a dishwasher ***are made*** *of steel and plastic.*
Steel sheets ***are formed*** *in the factory.*

4. Underline more examples of Passive Voice in the text above.

The present passive is formed: TO BE + PAST PARTICIPLE. Fill in the lines with your own examples of verbs in present passive.

E.g. _____
_____
_____
_____
_____

5. Read the short text. Choose the correct verb and put it into the correct form.

Assembling a Dishwasher

First the frame 1)_____(assemble/fix). Then the motor 2)_____ (dismantle/mount) to the frame and the tub 3)_____(fit/take out) and 4)_____(loosen/fasten) to the frame over the motor. At this point the interior components, such as the filtering system and the rack rollers, 5)_____(fix/glue) inside the dishwasher. Next the racks and the cutlery basket 6)_____ (assemble/put) in place. When this 7)_____(do/make), the detergent containers and the controls 8)_____(install/uninstall) to complete the door assembly. The door 9)_____ (hinge/assemble) to the front of the dishwasher. After that, the electrical connections and feed liner 10)_____(finish/do) to complete the assembly of the exterior. Then the insulation 11)_____(finish/wrap) around the machine. Finally, the wrap-around cabinet and wood top 12)_____(attach/hinge) to the standalone models.

8. Work in pairs. Student A will look at file A and student B will look at file B. Student A explains the process of distributing electricity from a power plant to Student B. Student B explains the process of distributing electricity from solar panels to Student A.

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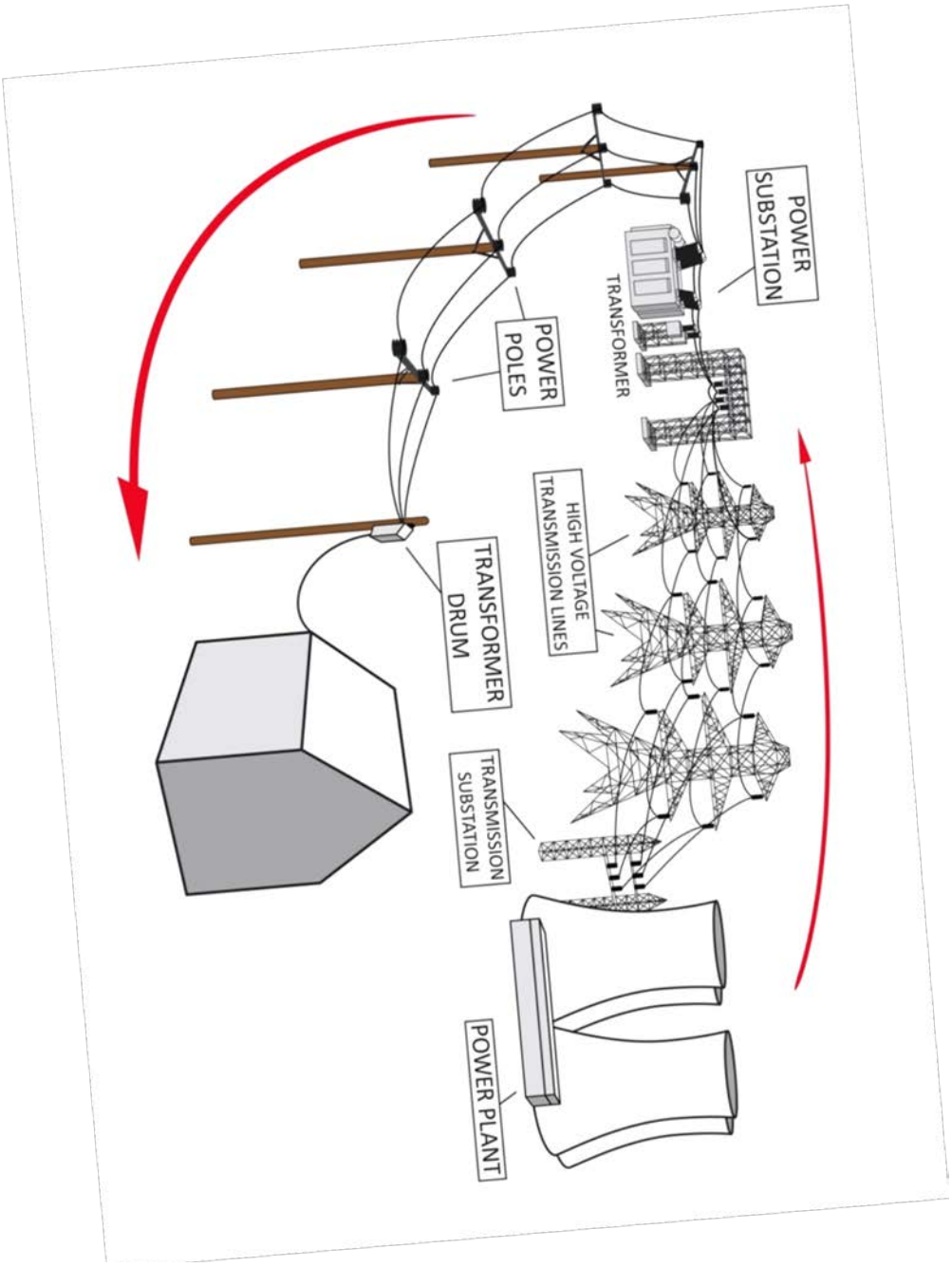
FILE A

Explain the process of distributing electricity from a power plant to Student B. In your explanation, use the following verbs: generate, increase, send through, decrease.



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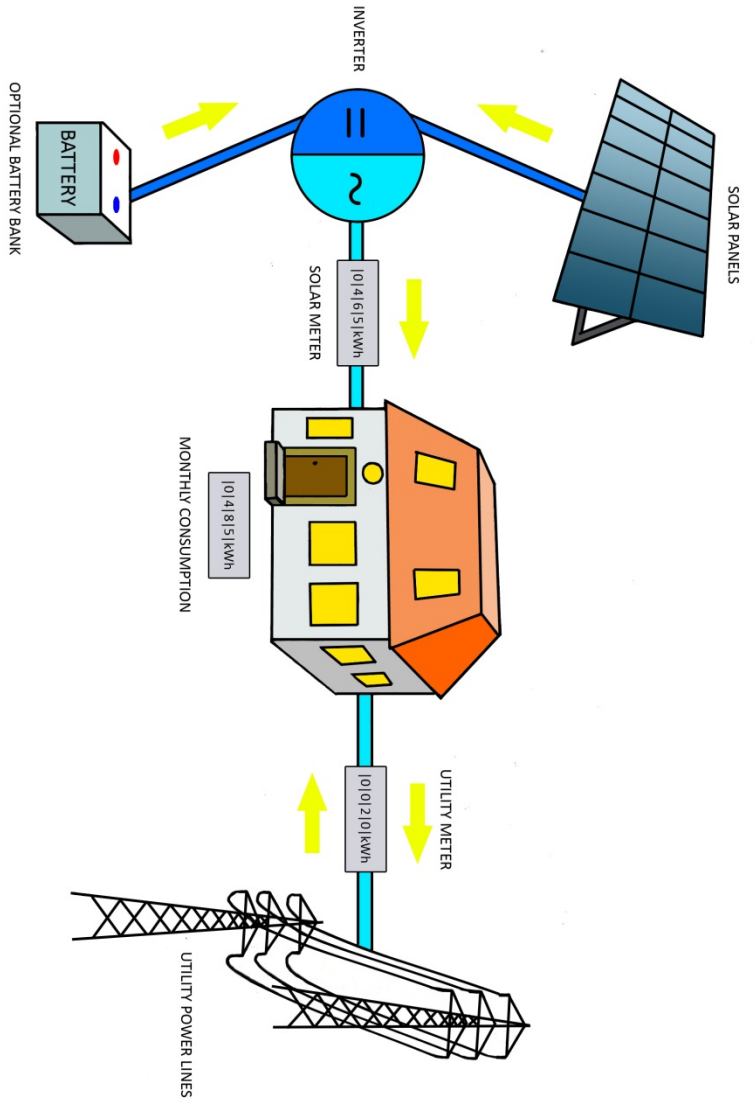
FILE B

Explain the process of distributing electricity from solar panels to Student A. In your explanation, use the following verbs: generate, convert, transmit, store, measure, distribute.



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UNIT 9A Passive Voice

Read the following extract from a report.
Sheets of stainless steel are purchased and fabricated in the required pieces and shapes …

1. Complete the sentence.
What happens with sheets of stainless steel?
They are _____ *and* _____ ...
2. Make the answer present perfect simple.
They _____ *and* _____ ...
3. Make the answer past simple.
They _____ *and* _____...
4. Make the answer future simple.
They _____ *and* _____...

5. Complete the rules about the active and passive voice.

- We use the _____ voice when the focus is on the action, especially in scientific or technical writing.
- We use the _____ voice when the actor is important.
- Creating the passive voice:
  Infinitive: (not to) _____ + the past participle form of the main verb
  Present simple: _____ / _____ / _____ (not) + the past participle form of the main verb
  Past simple: _____ / _____ (not) + the past participle form of the main verb
  Present Perfect: _____ / _____ (not) + _____+ the past participle form of the main verb
  Future simple: _____ (not) + _____+ the past participle form of the main verb

Creating the past participle form:
Regular verbs:
We add* -d *or* -ed*, to the base form of regular verbs, e.g.* joined, created, stopped, carried *(be careful about the spelling changes).
Irregular verbs:
***With irregular verbs it is called the 3rd form, e.g.* sent, been, undertaken.**

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Overview

	ACTIVE VOICE	**PASSIVE VOICE**	
PRESENT INFINITIVE	**(not) to improve**	(not) *to be improved*	by the company.

TENSES

Present Simple	The company improves its products. The company does not improve its products.	The products *are* (not) *improved*	by the company.
Present Perfect Simple	The company has (not) improved its products.	The products *have* (not) *been improved*	by the company.
Past Simple	The company improved its products. The company did not improve its products.	The products *were* (not) *improved*	by the company.
Future Simple	The company will (not) improve its products.	The products *will* (not) *be improved*	by the company.

Typical prepositions with the passive voice:

*The products were improved **by** design engineers.*
*The letter was written **with** a pen.*

Past participles sometimes can also be used as an adjective in front of a noun:

*Sheets of stainless steel are purchased and fabricated in the **required** pieces.*
*Please bring all of the **printed** documents for your interview tomorrow.*

6. Complete the sentences with the given expressions.

finish fail damage steal give cut down use publish cancel employ

a. Today's meeting _____ . (not)
b. It's a big factory. Five hundred people _____ there.
c. While I was on holiday, my camera _____ from my hotel room.
d. The Headquarters _____ next year.
e. My car _____ in an accident.
f. A new book on this issue _____ last year.
g. A prize _____ to the best employee annually since 1990.
h. This road _____ frequently in 2020. (not)
i. Several trees _____ to build that house.

7. Make the sentences passive.

a. They have not solved the complaint for two weeks.
b. Will they pay the bill in cash or by cheque?
c. Do they increase the profit monthly?
d. They designed some new houses.

e. They will export wine from France and Germany.
f. They released hundreds of people from their firm last year.
g. They have not developed new computer software recently.
h. Who created this software?

UNIT 9A Key

1. They are purchased and fabricated in the required pieces and shapes.
2. They have been purchased and fabricated in the required pieces and shapes.
3. They were purchased and fabricated in the required pieces and shapes.
4. They will be purchased and fabricated in the required pieces and shapes.

- We use the **passive** voice when the focus is on the action, especially in scientific or technical writing, where the actor is not important but the process or principle being described is of great importance.
- We use the **active** voice where the actor is important and, therefore, we use the actor(s) as a subject in a sentence.
- We create the passive voice as follows:
  Infinitive: (not to) **be** + the past participle form of the main verb
  Present tense: **am / is / are** (not) + the past participle form of the main verb
  Past tense: **was / were** (not) + the past participle form of the main verb
  Present perfect: **has / have** (not) + **been** + the past participle form of the main verb
  Future tense: **will** (not) + **be** + the past participle form of the main verb

6.

a. was not cancelled, has not been cancelled (could be future)
b. are employed
c. was stolen
d. will be finished
e. was damaged, has been damaged
f. was published
g. has been given
h. will not be used
i. have been cut down, were cut down

7.

a. The complaint has not been solved for two weeks.
b. Will the bill be paid in cash or by cheque?
c. Is the profit increased monthly?
d. Some new houses were designed.
e. Wine will be exported from France and Germany.
f. Hundreds of people were released from their firm last year.
g. New computer software has not been developed recently.
h. Who was this software created by?

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Vocabulary Unit 9A

active voice	činný rod
accident	nehoda
actor	činitel
annually	každoročně
base form	základní tvar
basket	košík
bill	účet
cabinet	kaslík, skříňka
carry	nést
cheque	šek
clean up	uklízet
coat	plášť, povlak, pokrýt
coiled	svinutý,, stočený
complaint	stížnost
consist of	skládat se z
consumption	spotřeba
container	nádoba
cutlery	příbory
damage	poškodit
decrease	snížit
detergent	mycí prostředek
dip	ponořit, klesnout
dishes	nádobí
dishwasher	myčka
dismantle	rozebrat
dispenser	automat, dávkovač
drain	vypouštět
employ	zaměstnat
extract	úryvek
fabricate	vyrobit
factory	továrna
fail	selhat
failure	selhání
fasten	utáhnout
fit	pasovat
fix	připevnit
foot	noha

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form	tvořit, forma
frame	rám
generate	generovat
glue	lepidlo, lepit
happen	stát se
Headquarters	hlavní sídlo
hinge	pant
hold	držet
hose	hadice
improve	zlepšit
in cash	hotově
in accordance with	v souladu
including	včetně
inert	nehybný
inject	vstříknout
injection-molded	vytvarovaný do formy vstřikováním
inside	uvnitř
insulation	izolace
invert	obrátit
irregular	nepravidelný
issue	záležitost
join	přidat se
loosen	uvolnit
major	hlavní
meal	jídlo
monthly	měsíční
mount	namontovat
noun	podstatné jméno
optional	volitelný
overview	přehled
passive voice	trpný rod
participle	příčestí
pay	platit
pellet	kulička
place	místo
plant	továrna, závod
pole	sloup, stožár
powdered	práškový
power plant	elektrárna
prevent from	zabránit
prize	cena

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production process	výrobní proces
publish	publikovat, vydat
purchase	nakoupit
put	umístit
rack	regál, police
recently	v poslední době
regular	pravidelný
reinforced	zesílený
release	propustit
required	požadovaný
resistant to	odolný vůči
rinse-aid	vyplachovací (pomůcka)
scientific	vědecký
scratch	poškrabat
several	několik
sheet	plát
show sb round	provést někoho
since	od
sleeve	rukáv
slide	klouzat
solve	řešit
spelling change	změna v hláskování
stainless	nerezavějící
standalone	samostatně stojící
store	uložit
subcontractor	subdodavatel
substation	rozvodna, napájecí stanice
such as	jako
tense	slovesný čas
tighten	utáhnout
tine	zub vidlí
tower	věž
tub	vanička
undertake	podniknout
utility	užitkový, technická infrastruktura
verb	sloveso
washer arms	mycí ramena
wash up	mýt nádobí
wood	dřevo
wrap-around	obalový

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UNIT 9B Safety in Electrical Engineering

1. Study the warning signs below and discuss the following questions:

What do they say?
Where can you find them?
Why are they located there?

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2. Read the text. Some parts of the text were taken out. Put them back into the correct places. Insert the letter of the missing part in the space provided.

ELECTRICAL HAZARDS[1]

While there are so many uses of electricity, there are also various electrical hazards. One of these electrical hazards is electric shock. Different effects may be experienced by a person who _____ (1). When someone gets electrically shocked, there is a sufficient amount of current that _____ (2) and the severity of its effect mainly depends on the rating and duration of the current flow. For direct current (DC), the minimum current rate that can shock a person is 5mA, while for alternating current (AC), 1mA is enough to have a significant effect. Electric shock may _____ (3). These results may lead to coma and even death.

Another serious electrical hazard is its tendency to start a fire. The most common thing that will probably cause a fire is a short circuit which _____(4). It may be due to a faulty wiring connection or the unintended contact of a piece of conductor in the circuit. When there is a short circuit, a spark occurs that may _____ (5). Therefore, it is very necessary to ask for the assistance of an electrician whenever there is electrical wiring to be done. A certified electrician is _____(6).

a. was enabled to pass through the person's body
b. cause burns, ventricular fibrillation, neurological effects, and arc-flash hazards
c. eventually cause a fire and explosion
d. accidentally touches an open portion of an electric circuit
e. occurs when separate lines in a circuit are accidentally connected by another conductor
f. knowledgeable about safety measures in making wiring connections

Find expressions in the text similar to the following phrases:

not working	happening without being planned or intended
big enough	activities done to improve safety
amount	lowest

Explain the following expressions from the text in your own words:

burns -
conductor -
coma -
assistance -
electric shock –

[1] Based on: Electrical Hazard, downloaded form http://victorwetherbee.articlealley.com/electrical-hazards-2226801.html on 30th October

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3. Look at the short extract below from the electrical safety handbook used in EEC Instructional Laboratories of the Massachusetts Institute of Technology.[2] Work in pairs and try to think of at least two more precautions, i.e. things to do to prevent accidents.

1. Unplug cords from electrical outlets by pulling on the plug instead of pulling the cord.
2. Always verify the power line you are working on is de-energized by measuring actual voltage.
3. Never put conductive metal objects into energized equipment.
4. Only use DRY hands and tools and stand on a DRY surface when using electrical equipment, plugging in an electrical cord, etc.

4. Study the language structures used in the precautions below and in 3. Identify examples of imperatives and modals:

- Unauthorised persons mustn´t enter the work area.
- Appropriate test equipment must be available at hand.
- Insulated tools and accessories should be well maintained.
- Firefighting equipment should always be accessible.

5. Select an appropriate verb in brackets. Then fill in the blanks in the sentences with a correct form of the selected verb. Check with a partner.

1. Only qualified electricians _____ replace fuses. (be allowed to/must)
2. Proper work practices _____ be followed to prevent accidents. (should/may)
3.Guidelines often _____to be modified so that they are suitable for particular tasks. (need/can)
4. Effective control measures _____reduce the risks. (be allowed to/have to)
5. Working near power lines and other electricity infrastructure _____be extremely dangerous. (can/must)
6. A formal permit _____be required where the risks are higher. (may/be permitted to)
7. Rubber shoes and gloves_____be worn when working with electricity. (should/need)
8. Contact _____be required for electrocution to occur. (may not/cannot)
9. Anything that is touching power lines _____be touched. (do not have to/ must not)

[2] Anant Agarwal and Jeffrey Lang, course materials for6.002 Circuits and Electronic, Spring 2007. MIT Open CourseWare (http://ocw.mit.edu/), Massachusetts Institute of Technology. Downloaded on 31st October 2011

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6. Rephrasing. Rewrite the following instructions with the expressions in brackets. Check with a partner.

Example: Turn off the electric power before working. (must)
Electric _____
Electric power must be turned off before working.

1. Clearly display safety regulations. (have to)
Safety _____
2. Conduct a first-aid drill at least once every 6 months. (must)
A first-aid drill _____
3. Only qualified electricians can install, repair and maintain electrical equipment. (be permitted to)
Only qualified _____
4. Take care when using electricity in and around the house, as an electric shock can be fatal. (should)
Care _____
5. Throwing objects onto power lines can result in electrocutions. (may)
Throwing _____
6. Do not touch live wires. (must not)
Live _____

7. Work in pairs. Discuss health and safety problems in the following places and situations:

- university
- thunderstorms
- laboratory

Write safety instructions for the situations listed above.

UNIT 9B SAFETY PRECAUTIONS

Use the following forms to create safety instructions:

Imperative:

Always verify *that the power line you are working on is de-energized.*
Unplug *cords from electrical outlets* ***by pulling*** *on the plug instead of pulling the cord.*

Negative imperative:

Do not touch *live wires.* ***Never put*** *conductive metal objects into energized equipment.*

Modals + phrasal modals: can, cannot, must, must not, should, should not, may, may not, have to

You ***can / should / may / must / have to switch this machine on after 5pm.***
You ***cannot / shouldn't / may not / mustn't ignore an explosive environment****.*
Maintenance ***cannot / shouldn't / may not / mustn't be neglected****.*
Safe work procedures ***should / must / have to be followed.***

Other expressions: avoid, prohibited, forbidden, no, make sure, not intended for, be allowed to, be permitted to

Avoid *touch****ing*** *power lines.*
Smoking in this area ***is prohibited****.*
No *smok****ing*** *in this area.*
Make sure *at least one other person can see you and hear you.*
Not intended for *use in potentially explosive atmosphere.*
Only qualified electricians ***are allowed to / are permitted to*** *climb pylons.*

1. Fill in the blanks in the sentences with correct forms or phrases. Where appropriate, use the expression in brackets.

a. Only qualified electricians _____ switch on assembly lines.
b. Risks and hazards should _____ (minimize) to protect health.
c. Every accident has _____ (investigate) properly.
d. _____ working on wet surfaces.
e. You _____ use insulated tools in a thunderstorm.
f. Employees must _____ (provide) with training.
g. _____touch metal structures in a thunderstorm.
h. _____ workers are given information to allow them to work safely.
i. A risk assessment should _____ (do) to identify the hazards, the risks arising from the hazards, and the control measures _____ (need) to control the risks.
j. You _____ eat in the lab.

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2. Rephrase the following instructions.

Example: *Train the staff for new work procedures.*
The staff …
The staff must be / have to be / should be trained for new work procedures.

a. Only qualified electricians can switch on assembly lines.
Assembly lines …

b. Before you can start welding, the risks must be assessed.
Always …
c. All work equipment should be regularly checked to ensure it is safe to use.
You …
d. Throwing objects onto power lines is prohibited.
Never …
e. Do not park in this area.
No …
f. People who perform dangerous tasks should be competent to do so.
Only ….
g. Never ignore control measures.
Control …

UNIT 9B Key

1. Sample answers

a. can / may / are allowed to / are permitted to
b. be minimized
c. to be investigated
d. No / Avoid
e. must / can / need to / have to / should / are allowed to
f. be provided
g. Never / Do not
h. Make sure
i. be done, needed
j. should not / cannot / must not / may not / are not permitted to / are not allowed to

2. Sample answers

a. Assembly lines can be switched on only by qualified electricians.
b. Always assess the risks before you start welding.
c. You should check all work equipment regularly to ensure it is safe to use.
d. Never throw objects onto power lines.
e. No parking in this area.
f. Only competent people can perform dangerous tasks.
g. Control measures must not be ignored.

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Vocabulary Unit 9B

accesories	doplňky
accessible	dosažitelný
accidentally	nešťastnou náhodou
actual	skutečný
alternating current (AC)	střídavý proud
always	vždy
amount	množství
appropriate	vhodný
arc flash	obloukový výboj
arc-welding	svařování obloukem
arise	nastat, vzniknout
assess	zhodnotit
assessment	hodnocení
assistance	pomoc
at hand	po ruce
at least	nejméně
be allowed to	smět
be permitted to	mít povolení k něčemu
body	tělo
bracket	podpěra, závorka
burns	spáleniny
can	může, umí
cannot	nemůže, neumí
cause	příčina, zavinit, zapříčinit
certified/qualified electrician	kvalifikovaný, autorizovaný, ověřený elektrikář
check	zkontrolovat
climb	šplhat, lézt
coma	kóma
common	běžný
conduct	provádět; vést elektřinu
conductive	vodivý
conductor	el. vodič
cord	šňůra, kabel
danger	nebezpečí
dangerous	nebezpečný
death	smrt
de-energize	odpojit od napětí

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direct current (DC)	stejnosměrný proud
display	vystavit
drill	výcvik, nácvik
dry	suchý
due to	díky čemu
duration	trvání
effect	následek
electric shock	zásah el. proudem
electrical wiring	el. rozvod
electrocute	zabít elektr. proudem
electrocution	smrt elektřinou, zabití el. proudem
energized (= live, = hot)	pod napětím
ensure	zajistit
equipment	vybavení
environment	prostředí
experience	zažít
explosive	výbušný
fatal	smrtelný, osudný
faulty	vadný, kazový, poruchový, závadný, chybný
fire	oheň
firefighting	hašení požádu
first-aid	první pomoc
flow	tok
follow	zde: dodržovat, následovat
forbidden	zakázaný
fuse	pojistka
glove	rukavice
guideline	pravidlo, pokyn guidelines = směrnice
handbook	příručka
have to be followed	musí být dodržovány
hazard	riziko
health	zdraví
imperative	rozkaz
instead of	namísto
insulate	izolovat
intended	zamýšlený, úmyslný
investigate	vyšetřovat
knowledgeable	dobře informovaný, erudovaný
label	štítek (warning label – výstražný štítek)
mainly	hlavně
maintain	provádět údržbu

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maintenance	údržba
make sure	ujistit se
may	smí, může
may not	nesmí, nemůže
measure	opatření
modify	upravit, změnit
must	musí
must not	nesmí
need	potřebovat
neglect	zanedbat
Never put	Nikdy nedávej
not intended for	není určený pro
occur	vyskytovat se, objevit se
outlet AM, socket BR	zásuvka
particularly	zvláště, hlavně
pass through	procházet skrz
perform	provádět (do, carry out)
permit	písemné povolení, povolit
plug	zástrčka
portion	porce, kus, část
precaution	opatření (preventivní n. bezpečnostní)
probably	pravděpodobně
procedure	postup, způsob práce
prohibit	zakázat
proper	řádný, správný, náležitý
protect	chránit
provided	za předpokladu
pull	táhnout
pylon	sloup el. vedení, stožár
rate	míra, poměr
rating	Zde: charakteristika, výkon stroje
recommendation	doporučení
reduce	omezit
regularly	pravidelně
regulation	nařízení, předpis
replace	vyměnit
require	vyžadovat
repair	opravit
result	následek, výsledek
rubber	gumový
rule	pravidlo, norma, směrnice, předpis

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safe	bezpečný
safety	bezpečnost, bezpečnostní
safety measures	bezpečnostní opatření
safety regulations	bezpečnostní předpisy
serious	vážný
severe	vážný
severity	vážnost, závažnost
shoes	boty
short circuit	zkrat
should	by měl
should not	by neměl
sign	značka
significant	podstatný
spark	jiskra
staff	personál, zaměstnanci
stand	stát
strike, struck, struck	strefit (se), udeřit
sufficient	dostačující, dostatečný
suitable	vhodný
switch on	pustit
prohibited	zakázaný
take care	opatrovat se
take a measure	učinit opatření
task	úkol
throw	házet throw, threw, thrown
thunderstorm	bouřka
tool	nástroj
touch	dotknout se
turn off	vypnout
unauthorized	neoprávněný
unintended	neúmyslný
unplug	odpojit ze zásuvky
various	různé, rozličné
ventricular fibrillation	fibrilace srdečních svalů
verify	ověřit
warning	varování, výstražný
wear, wore, worn	nosit
welding	sváření
wet	vlhký

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UNIT 10A Job-Related Accidents

1. Work in pairs and discuss the following questions:

Why is work safety essential?
Have you heard about any job-related injuries?
Which professions are the most dangerous and why?
What are the potential dangers in electrical engineering?

2. Listen to the first part of a radio programme about accidents in electrical engineering and decide whether the following statements are TRUE OR FALSE. Before listening, discuss the possible results with your colleague.

1. Voltage and amperage kill people.
2. Two causes of accidents are people making mistakes and not paying enough attention.
3. Most accidents happen to non-professionals at home.

3. Listen to the second part of the programme describing five accidents.
Match the following descriptions to each of the accidents.

a. Fortunately, the emergency ambulance saved the worker. The power supply was turned off but not locked out.
b. There was no injury. But it could easily happen.
c. Non-insulated switchgear caused severe burns to a worker inspecting it.
d. A worker died because of injuries he had suffered in an explosion.
e. A worker suffered serious injuries when he was doing some maintenance.

4. Fill in the text. Use the words provided in the box below.

struck	*endangered*	*excavation work*	*neither*

An accident happened during _____ _____ (1) when a subcontracted labourer _____(2) and damaged an underground 11,000 Volt live electric cable while he was digging a hole using a pneumatic breaker. Yet work continued, which seriously _____ (3) the lives of other workers. The investigation revealed that the labourer was provided with _____(4) plans showing the location of cables nor cable-detecting equipment.

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dermal	*inspect*	*live*	*repairs*

A company employed maintenance electricians to undertake _____ (5) in one of their plants. They also had to _____(6) a 6,000 Volt switchgear with the authorization of the company. As they were doing this, the foreman received deep _____ (7) burns from the equipment. It was found that the switchgear was _____ (8) because it was not insulated.

alterations	*spark*	*stored*	*vapours*

A welder suffered fatal burns to his torso and died in the hospital after flammable solvent _____ (9) were ignited by an electric _____ (10) from his portable welder during _____ (11) to a chemical warehouse. The company was found not to have informed the contractor's employees about flammable solvents being _____ (12) inside, creating a potentially explosive atmosphere.

by	*supervisor*	*sustained*	*troubleshooting*

An electrical fitter was _____ (13) a generator on a production line. He turned off the power supply but did not lock it out. His _____ (14) came to help find the problem and threw the disconnected switch on as he passed _____(15). The fitter _____ (16) a 220 Volt electric shock that stopped his heart. He had to be resuscitated and taken to the hospital for a medical check.

do	*investigation*	*safe working zones*	*supply*

An electrician was severely injured by a 22,000 Volt electrical _____ (17) while he was climbing live apparatus in a substation to _____ (18) some maintenance on it.
The_____ (19) of the incident showed that _____(20) were not established and demarcated.

5. Select the hazard that best matches each accident. Sometimes there is more than one option.

Accident 1	a. Untrained/Unqualified worker b. Poor maintenance
Accident 2	c. Inadequate instructions d. Person not competent
Accident 3	e. Ignoring safe work practices f. Poor safety precautions
Accident 4	g. Failure to properly manage work h. Equipment in poor condition
Accident 5	i. Explosive environment

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6. Language study:

For writing an incident or accident report, past tenses are used.

*He **turned off** the power supply but **did not lock** it out.* ***Past Simple***

*An electrical fitter **was troubleshooting** a generator on a production line.* ***Past Continuous***

*He **was taken** to hospital.* ***Past Simple Passive***

Look back at the text and underline verbs that are past simple, past passive and past continuous.

7. Complete the text with the correct form of the verbs in brackets.

An apprentice (1)_____ (receive) an electric shock that (2)_____ (break) his jaw while he (3)_____ (attempt) to test an electric circuit in an assembly line that (4)_____ (wire) to the mains lead incorrectly. The investigation (5) _____ (show) that the apprentice (6)_____ (expose) to live wires at 220 Volts. Suitable precautions (7)_____ (not take) to prevent electrical injury.
Action: The employer of the apprentice electrician (8)_____ (prosecute).

8. Look at the questions a health and safety officer asked when interviewing a witness. Put the words in the correct order and write the questions.

1. happened/ what?

_____

2. accident /did /the/when /happen?

_____

3. in /was/accident/involved /who/the?

_____

4. follow /he /the/did/operating /standard /procedure?

_____

5. get/how/injured/did/the/workers?

_____

6. provide/first /the/workers/ aid /at /did /the /site?

_____

7 accident/other/were /people/who /there /saw /any /the?

_____

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9. Work in pairs. Use the questions from Exercise 8 and act out an accident investigation interview. Make notes. Student A will use the information from File 1. Student B will use the information from File 2. When necessary, invent some details.

Use your notes to write a report. Describe the accident in complete sentences, using appropriate tenses.

Useful verbs: *carry, trip, explode, cut, drive, spill, slip, fall, repair, catch (fire), wear, get caught (in machinery), etc.*

Employee Accident Report

Date _____

Employee
Name _____
Title/position _____

Manager
Name _____
Title/position _____

Incident
Date _____
Time _____
Location _____

Description of accident
_____
_____
_____
_____

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File 1

This role has two stages.

1. You are an accident witness. Answer all questions asked by the health and safety officer. Use the information below:
    - Patrick Smith
    - burnt his arm
    - exposed to fire
    - at noon
    - taken to hospital
2. You are a health and safety officer. Interview the witness. Make notes.

File 2

This role has two stages.

1. You are a health and safety officer. Interview the witness. Make notes.
2. You are an accident witness. Answer all questions asked by the health and safety officer. Use the information below:
    - Anne Brooks
    - slipped on
    - broke her leg
    - 2 p.m.
    - taken to hospital

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3_4 Unit 10A Task 2.

Although electricity is a great convenience, it can also be dangerous and must be treated respectfully. In spite of that, electrical accidents occur every day of the year. More often than not, they are fatal, depending on their particular voltage and amperage. Every year, thousands of workers are treated in hospitals for electric shock and severe injuries. Human errors and carelessness are the most common causes of electrical accidents, most of which happen during routine maintenance or troubleshooting.

5_6_7_8_9 Unit 10A Task 3.

Accident1

An electrician was severely injured by a 22,000-Volt electrical supply while he was a climbing live apparatus in a substation to do some maintenance on it. The investigation of the incident showed that safe working zones were not established and demarcated.

Accident2

A company employed maintenance electricians to undertake repairs in one of their plants. They also had to inspect a 6,000 -Volt switchgear with the authorisation of the company. As they were doing this, the foreman received deep dermal burns from the equipment. It was found that the switchgear was live because it was not insulated.

Accident3

A welder suffered fatal burns to his torso and died in a hospital after flammable solvent vapours were ignited by an electric spark from his portable welder during alterations to a chemical warehouse. The company was found not to have informed the contractor's employees about flammable solvents being stored inside, creating a potentially explosive atmosphere.

Accident4

An accident happened during excavation work when a subcontracted labourer struck and damaged an underground 11,000-Volt live electric cable while he was digging a hole using a pneumatic breaker. Yet work continued, which seriously endangered the lives of other workers. The investigation revealed that the labourer was provided with neither plans showing the location of the cables nor the cable-detecting equipment.

Accident5

An electrical fitter was troubleshooting a generator on a production line. He turned off the power supply but did not lock it out. His supervisor came to help find the problem and threw the disconnected switch on as he passed by. The fitter sustained a 220-Volt electric shock that stopped his heart. He had to be resuscitated and taken to the hospital for a medical check.

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UNIT 10A Expressing the Past

Read the following extract from an accident report.

On May 10, 2012, at 11.23 a.m., J. Nox, a technician, suffered a fatal injury to his head because he was not wearing a helmet while he was doing maintenance work. A tool falling from a height hit his head when it was dropped by an apprentice who was changing wires on electrical circuits.

1. Complete the sentences.

a. What was Mr.Nox doing at 11.23?
Mr.Nox was (1) _____ maintenance work. He (2)_____ a helmet.
He (3) _____ a serious injury.
When/While Mr.Nox (4)_____ maintenance work, he (5)_____ a serious injury.

b. What was an apprentice doing at 11.23?
He (1)_____ wires. He (2)_____ a tool.
When/While an apprentice (3)_____ wires, he (4)_____ a tool.

c. When/While Mr.Nox (1)_____ maintenance work, an apprentice (2)_____ wires and (3)_____ a tool which (4)_____ Mr.Nox's head.

2. Complete the rules about the past simple and past continuous.

- We use the past _____to talk about an action that happened at a specified time in the past.
- We use the past _____to talk about an action that was already in progress at/for a specified length of time in the past.
- We create the past continuous using _____ (not)/_____(not) + -____ form of the main verb (the present participle form).

3. Fill in the blanks with the correct form of the verbs in brackets.

A foreman (1)_____ (receive) an electrical shock from alternating current that seriously (2)_____ (burn) his skin while he (3)_____ (replace) a fuse on an electric circuit in an assembly line that (4)_____ (not de-energize). It (5)_____ (find) that while he (6)_____ (fix) the circuit, he (7) _____ (expose) to live wires at 380 Volts that had cracked insulation. Regular maintenance (8)_____ (ignore).

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4. Complete the story with any correct forms.

Last Monday afternoon, at around 9 o'clock, a labourer (1)_____ an electric shock. He (2)_____ rusty wiring when one cable (3)_____ down. The wet floor was not (4)_____ . The labourer (5)_____ (not) boots with rubber soles. He (6)_____ first aid by other workers. They (7)_____ for an ambulance. The injured labourer (8)_____ to the hospital. Fortunately, the injuries (9)_____ (not) a serious impact.

UNIT 10A Key

1.

a. (1) doing (2) was not wearing (3) suffered (4) was doing (5) suffered
b. (1) was changing (2) dropped (3) was changing (4) dropped
c. (1) was doing (2) was changing (3) dropped (4) hit

2.

- We use the past **simple** to talk about an action that happened at a specified time in the past.
- We use the past **continuous** to talk about an action that was already in progress at OR for a specified time in the past.
- We create the past continuous tense using **was /were + _-ing** form of the main verb.

3.

(1) received (2) burnt (3) was replacing (4) was not de-energized / had not been de-energized
(5) was found (6) was fixing (7) was exposed (8) was ignored

4.

Sample answers

(1) suffered, got, (2) was repairing, (3) fell, (4) insulated, (5) was not wearing, (6) was provided, (7) called, (8) was taken, (9) did not have

Vocabulary Unit 10A

accident report	hlášení o nehodě
alteration	změna, modifikace, úprava
ambulance	sanitka
apprentice	učeň
attempt	pokoušet se, pokus
attention	pozornost (pay attention – věnovat pozornost)
boots	boty
break	zlomit
carelessness	nedbalost, ledabylost
condition	stav
contractor	smluvní strana, dodavatel
convenience	vymoženost
cracked	popraskaný
demarcate	vytyčit, označit, vymezit, ohraničit
dermal burns	kožní popáleniny
die	zemřít
dig (dug, dug)	kopat
drop	upustit, klesnout, snížit se
during	během
earth	uzemnit AE: ground
electrical fitter	elektro instalatér
electrician	elektrikář
emergency ambulance	pohotovost
endanger	ohrozit
error	chyba
essential	nezbytný, základní
establish	ustanovit, zřídit
excavation work	výkopové práce
explode	explodovat, vybuchnout
expose	vystavit vlivu
failure to do something	neschopnost udělat co, selhání
fall, fell, fell	spadnout
fault	vada, defekt
faulty	vadný, defektní
find	shledat, zjistit
fitter	montér, mechanik

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flammable	hořlavý
floor	podlaha
foreman	předák , mistr AE: ganger
fortunately	naštěstí
get caught	být zachycen
health and safety officer	bezpečnostní úředník
heart	srdce
height	výška
helmet	helma
hole	díra
hospital treatment	ošetření v nemocnici
human	lidský
hurt	zranit, zranění, bolet
ignited	zapálit, zažehnout
impact	dopad
in poor condition	ve špatném stavu
inadequate	nedostatečný, neodpovídající
incident	případ, incident, nehoda
investigation	vyšetřování
jaw	čelist
job-related accidents	pracovní úrazy
labourer	nekvalif. pracovník, dělník, pomocník
leg	noha
live apparatus	zařízení pod proudem
lock out	uzamknout přístup ke zdroji el. proudu poté, co byl zdroj vypnut
loss of mind	ztráta vědomí
mains lead	hlavní přívod el. energie, hlavní rozvod, hlavní vedení
making mistakes	dělání chyb
medical check	zdravotní prohlídka
neither…nor	ani…ani
offence	přestupek, provinění
own	vlastní
pass by	míjet, jít kolem
pay attention	dávat pozor
pneumatic breaker/drill (= road breaker)	sbíječka
portable	přenosný
potentially	potenciálně
practices	praktiky
progress	vývoj
prosecute	soudně stíhat, zažalovat
prosecution	žaloba, soudní/trestní stíhání

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protective	ochranný
result from	vznikat, být následkem čeho, vyplývat z
result in	mít za následek (co), skončit (čím)
resuscitate	oživovat
reveal	odhalit, odkrýt
rubber soles	gumové podrážky
rusty	rezavý
safe working zones	bezpečné pracovní zóny
select	vybrat
serious	vážný
severe	vážný, těžký (o zranění)
skin	kůže
slip	uklouznout
solvent	rozpouštědlo, rozpouštěcí, rozpustný
spill	rozlít
stage	stupeň
store	skladovat, uložit
suffer	trpět, utrpět
suitable	vhodný
supervise	dohlížet na
supervisor	dohlížitel
supply	zdroj
sustain	utrpět
switchgear	rozvaděč, rozvodna
technician	technik
throw on (threw – thrown)	nahodit (spínač)
torso	trup
treat	zacházet, léčit
trip	zakopnout
troubleshooting	řešení problémů, odstraňování závad
undertake	vykonat, provést, podniknout
untrained	neproškolený
vapours	pára, výpary
victim	oběť
warehouse	sklad, skladiště
welder	svářeč, svářečka
wired	elektricky připojený
witness	svědek
yet	přesto

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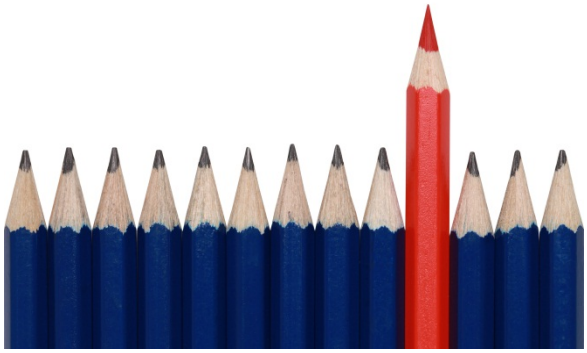
UNIT 10B Expressing Contrast

1. Tips for Buying a Car
Work in groups. Imagine your friend is going to buy a car. Within each group, agree on some criteria that he/she should take into consideration when deciding on what car to buy. Also, list some advantages and disadvantages of owning a car. Finally, compare the suggestions given by the individual groups.



2. Imagine you are in a car showroom planning to buy a car. How would you ask the car salesman about the following?

Price	
Fuel Mileage	
Capacity/no. of cylinders	
Fuel Type	
Horsepower	
Length/width/height	
Passenger Air Bag	

3. Work in pairs. Compare the cars below.

	2009 Nissan Maxima	**2003 Ford Explorer**	**2003 Chrysler Voyager**
Price	$30,160	$21,870	$20,960
Fuel Mileage	Hwy: 26 MPG City: 19 MPG	Hwy: 22 MPG City: 17 MPG	Hwy: 27 MPG City: 21 MPG
Capacity/number of cylinders	3.5L/ 6 cylinders	4.0L/ 6 cylinders	2.4L/ 4 cylinders
Fuel Type	Gasoline	Gasoline	Gasoline
Horsepower	290	203	150
Overall Length	484.12 cm	468.12 cm	480.31 cm
Vehicle Height	146.81 cm	173.74 cm	175.01 cm
Vehicle Width	185.93 cm	178.31 cm	199.64 cm

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4. Look at the specifications given above (in 3) and complete the gaps below.

Adjective	Comparative	Superlative
Cheap	Chrysler is (much) _____ than Chrysler.	Chrysler is _____ of all.
Expensive	Nissan is (much) _____ than Chrysler.	Nissan is _____ of these three cars.
Good	In my opinion, Chrysler is _____ than Ford.	I think Nissan is _____ of them.
As… as… **So…as…**	Chrysler is almost as expensive as Ford. Chrysler is not as expensive as Nissan. Chrysler is not so expensive as Nissan.	

5. Answer the questions.

1) How are comparatives and superlatives formed?
2) Are there any spelling changes sometimes?
3) What's the difference between than and then?
4) Do you know any other irregular adjectives?

6. Do you consider yourself to be a good driver? Describe how you drive.

7. Put the adverbs you used in Exercise 6 in the chart below.

Adverb	Comparative	Superlative

Mark the irregular adverbs.

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8. Look at the two following texts comparing different cars and fill in the missing words. You must choose from the following words:

addition both differ difference differences different however resembles similarities similarly the same while

Comparison – focus on _____	**Contrast – focus on differences**
Chrysler _____ Ford in many ways. First, the body shape of Chrysler and Ford is almost _____. In _____, they both cost around $21,000. _____, _____ Chrysler and Ford are about 172 cm high.	There are many _____ between Nissan and Ford. I think the greatest _____ is the price. Nissan is $30,160, but Ford is "only" $21,870. The vehicles also _____ in their dimensions. Nissan is 185.93 cm wide, _____ Ford is 178.31 cm wide. The height of the vehicles is also _____. Nissan is 146.81 cm high. _____, Ford is 26.67 cm higher.

9. Translate the following from the left text: *both - and*

10. Below, you can find some other useful comparison and contrast expressions. Put them into the correct columns. Some of them have been done for you.

Comparison	**Comparison or contrast?**	**Contrast**
similar to the same as	Chrysler has 4 cylinders**, as opposed to** Nissan, which has 6 cylinders. Nissan has 6 cylinders and Ford has 6 cylinders**, as well.** Nissan has 6 cylinders and Ford has 6 cylinders**, too.** **Like** Nissan**,** Ford has 6 cylinders. **Unlike** Nissan**,** Chrysler has 4 cylinders. **Even though** Ford has 6 cylinders**,** it is not very powerful. Ford has 6 cylinders. **Nevertheless,** it is not a powerful car. **On the one hand,** Ford has 6 cylinders. **On the other hand,** it is not powerful. **Each of** the three cars uses gasoline.	whereas although

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11. Comparison or Contrast? Combine these sentences showing comparison or contrast.

1. Tobacco is injurious to health. Alcohol is injurious to health.
2. Arabic is read from right to left. English is read from left to right.
3. Taxis are expensive. Public transport is cheap.
4. Learning to drive a car requires a lot of patience. Learning a language requires a lot of patience.
5. Rome as a major tourist centre invests large sums of money in preserving its ancient buildings. Cairo has discovered that well-preserved ancient buildings are a significant tourist attraction.
6. Japanese industry invests considerable sums of money in research and development. British investment in this area is low.

DILEMMA - WHAT SHOULD I BUY?

Work alone. First you need to choose two similar products you are considering buying. It can be, for example – a conventional mobile phone or a smart phone, a usual personal desktop computer or laptop, Linux or Windows, etc. Then follow the instructions:

1. Make a list of things/features the two products have in common. **Focus on similarities.**
2. Make a list of things/features the two products do not have in common. **Focus on differences and contrast.**
3. Write a short text (minimum 8 sentences) analysing their differences and similarities**. Use comparison and contrast vocabulary** you have learned in the unit.

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Unit 10B

Overview : Adjectives

Adjectives with 1 or 2 syllables			
Explanation	**Adjective**	**Comparative**	**Superlative**
Add "-er" to create comparative. **Add "-est" to create superlative.**	tall	tall**er**	**the** tall**est**
Short adjectives double the final consonant if the final combination is consonant – vowel – consonant.	big	bi**gg**er	the bi**gg**est
"y" changes into "i" after a consonant.	eas**y** pretty	eas**ier** pretti**er**	the eas**iest** the pretti**est**
"y" changes into "i" after a consonant, but not after a vowel.	gre**y**	gre**yer**	the gre**yest**
If an adjective finishes in "-e", we add only "-r" for comparative and "-st" for superlative.	nic**e**	nice**r**	the nice**st**
ending in **-ful, -re, -ed**	useful	**more** useful	**the most** useful
ending in **-ow, -er, -le**	clever	clever**er** **more** clever	the clever**est** **the most** clever
True	true	more true truer	most true the truest

If you are not sure, use **more** and **most.**

Long adjective with 3 or more syllables			
Explanation	**Adjective**	**Comparative**	**Superlative**
Add "more" to create comparative. **Add "most" to create superlative.**	difficult	**more** difficult	**the most** difficult

Irregular adjectives

far	farther	the farthest
	further	the furthest
many, much	More	the most
little	Less	the least
few	Fewer	the fewest
good	Better	the best
bad	Worse	the worst
old	older, elder	the oldest, the eldest
late – pozdní, pozdě	Later	the latest

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Comparing (short and long adjectives)

Positive: *This car is (almost)* ***as*** *fast / expensive* ***as*** *my car.*
So is possible in **negatives:** *This car is* ***not as / so*** *expensive* ***as*** *my car.*

A truck is not ***the same as*** *a van.*
A Chrysler is ***different from*** *a Toyota.*

Comparative
*This car is fast****er / more*** *expensive* ***than*** *my car*
This car is ***much faster / much more expensive than*** *my car.*
This car is ***far faster / far more expensive than*** *my car.*

Superlative
This car is ***the*** *fast****est of all / the most*** *expensive of all.*

Other phrases
Both *a BMW* ***and*** *a VW are good makes.*
Neither *Chinese* ***nor*** *Russian cars are reliable.*
A BMW ***as well as*** *a VW are luxurious.*
A BMW is a good powerful car, ***as well****.*
Compared to *a BMW, a Trabant is not a powerful car.*

Overview : Adverbs

Adjective	Adverb	Explanation
A caterpillar truck is a **slow** vehicle.	A caterpillar truck moves **slowly**.	
New	newly	
Full	fully	
simple, gentle	simply, gently	-le changes into -ly
beautiful, careful, real	beautifully, carefully, really	final -l + -ly = double ll
easy, happy, noisy	easily, happily, noisily	y changes into i after a consonant

Irregular adverbs

Adjective	Adverb	Change in meaning
fast	fast	
long	long	
little	little	
early	early	
good	well	
near	near	nearly - téměř
hard	hard	hardly – stěží někdy, skoro nikdy
late	late	lately – nedávno, v poslední době
most	most	mostly – většinou, ve většině případů

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Comparatives and superlatives of adverbs

Regular

carefully	**more** carefully	the **most** carefully
quickly	more quickly	the most quickly

Irregular

fast	faster	the fastest
long	longer	the longest
little	less	the least
early	earlier	the earliest
good	better	the best
badly	worse	the worst
near	nearer	the nearest
hard	harder	the hardest
late	later	the latest
much	more	the most

The most carefully *written text.*
He worked ***the hardest****.*

Comparing
She gets up ***as early as*** *her manager.*
I drive ***carefully*** *but my brother drives* ***much more carefully than*** *me.*
This employee works ***the hardest of all****.*

Adjectives instead of adverbs

It	looks	**strange**. (not: ~~strangely~~)
	sounds	**terrible**.
	tastes	**delicious.**
	smells	**bad.**
	feels	**good.**
	flies	**high.**

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Vocabulary Unit 10B

adjective	přídavné jméno
advantage	výhoda
adverb	příslovce
ancient	starodávný, antický
as opposed to	na rozdíl od
as well	také
as (well) - as	tak jako
both	oba
both – and	jak - tak
caterpillar	housenka
clever	chytrý
column	sloupec
comparative	komparativ, druhý stupeň
comparing	porovnávání
considerable	značný
consonant	souhláska
contrast	rozdíl
cost	stát
cylinder	válec
delicious	výborný
differ	lišit se
difference	rozdíl
different from	rozdílný
dimension	rozměr
disadvantage	nevýhoda
discover	objevit
each of	každý z
early	brzo
explanation	vysvětlení
express	vyjádřit
far	vzdálený
feel	cítit
final	koncový
fly	létat
fuel	palivo
gasoline	benzín

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height	výška
horsepower	koňská síla
injurious	škodlivý
length	délka
like	stejně jeko
make	značka
mark	označit
mileage	ujeteé míle, dojezd na galon
much	mnohem
of all	ze všech
owning	vlastnění
passenger	pasažér
patience	trpělivost
preserve	zachovat
public	veřejný
resemble	podobat se
salesman	obchodník
significant	významný
similar to	podobný
similarities	podobnosti
similarly	podobně
smell	být cítit
strange	divný
suggestion	návrh
superlative	superlativ, třetí stupeň
syllable	slabika
take into consideration	vzít v úvahu
taste	chutnat
terrible	hrozný
than	než
the same as	stejný jako
too	také
truck	nákladní auto, kamion
useful	užitečný
vehicle	votidlo
vowel	samohláska
width	šířka

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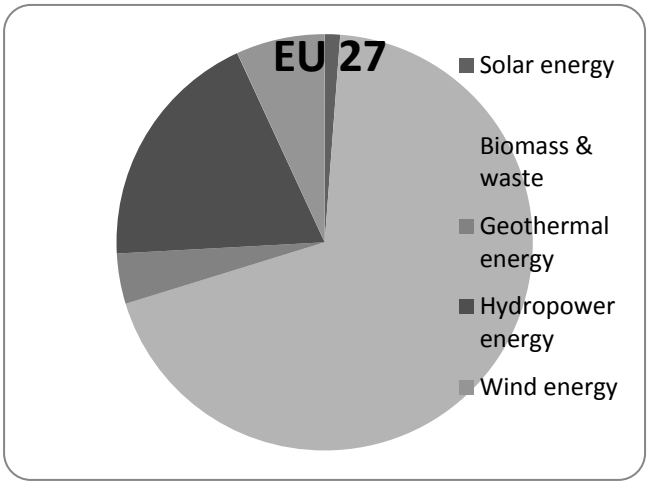
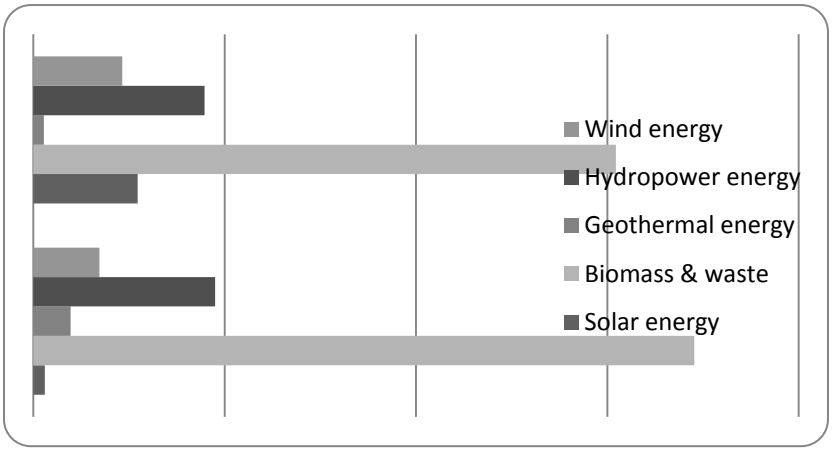
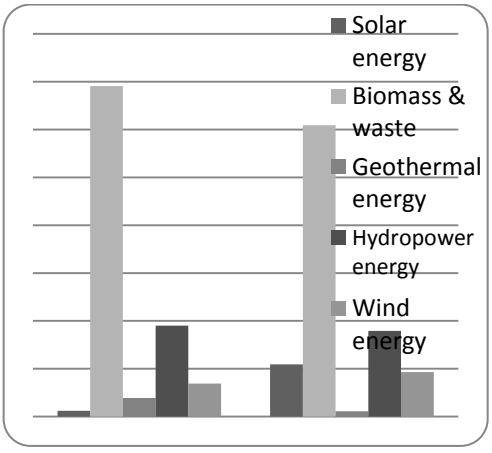
UNIT 11A Describing a Graph

1. Look at three graphs below showing information about primary production of renewable energy.[1] Study the graphs carefully and answer the following questions. Then check the answers with a colleague.

a) What does each graph show?
   Describe it in your own words.
b) Is it always suitable to use a pie chart?
   If not, in which cases is it inappropriate?
c) Is there any difference between
   a bar chart and a column chart?
d) Why is a line graph not used?







[1]The information used in the graphs is from statistics of Eurostat. Downloaded from http://epp.eurostat.ec.europa.eu/statistics_explained/images/e/e7/Primary_production_of_renewable_energy.png on 13th November 2011.

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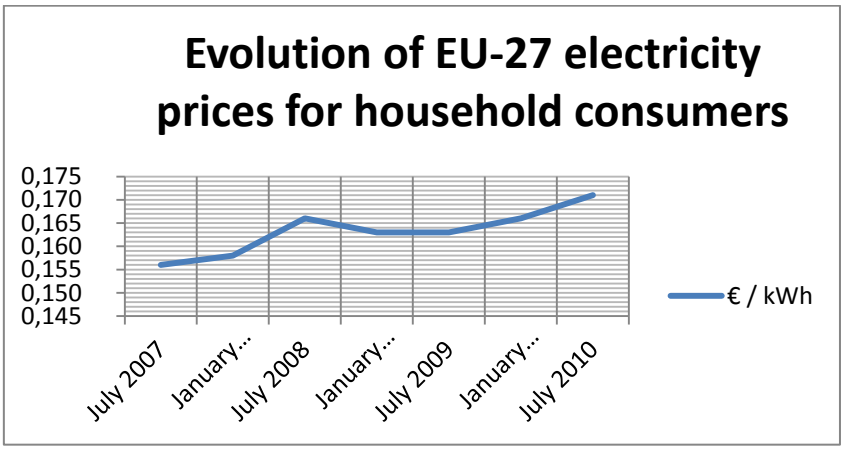
2. Now, study another graph and focus on details. Using the information[2] from the line graph, answer the following questions.

1) What does the curve show?
2) What does the X-axis (horizontal) show?
3) What does the Y-axis (vertical) show?
4) What was the kWh price in January 2009?
5) When did the kWh price reach its peak?
6) What happened to the kWh price between January and July 2009?
7) What happened to the kWh price between July 2008 and January 2009?
8) What happened to the kWh price between January and July 2008?



3. Listen to three short recordings and fill in the missing words.

Recording 1: The graph _____(1) the number of cases of job-related accidents in our company _____(2) the years 1996 and 2010. As an overall _____ (3), you can see that the number of cases is _____ (4) . This is caused by the safety measures we have introduced.
Recording 2: Between 1960 and 1965, the number of cases _____ (5) constant. It stood at _____ (6) 100. That number _____ (7) steadily to 200 by 1970, and then more _____(8) to 500 in 1975. At this point the number of cases remained_____(9) until 1981 before it started _____(10) again.
Recording 3: In _____(11), the graph shows that the prices were gradually decreasing. There was only one _____ (12) fall at the beginning of last year.

[2] The information used in the graph is from statistics of Eurostat. Downloaded from http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Electricity_and_natural_gas_price_statistics on 13th November 2011

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4. Look at the transcript and answer the following questions:

1. What is the difference between using the verbs RISE and RAISE?
2. What is the difference between using the prepositions TO and BY?
3. What adverbs can we use when describing how the curve has changed? We usually form them from adjectives. Make a list of them.

5. Study the following verbs that we can use when describing a graph and divide the verbs into three groups according to the direction they describe. Decide which of them can be used as nouns as well.

to hit a maximum/minimum *collapse* *dip* *drop* *fluctuate (around)*
maintain the same level *go down* *peak* *plummet*
remain constant/stable/steady *rocket* *fall* *go up*

UP	DOWN	LEVEL

6. Adjectives or Adverbs? Choose correct words to complete the gaps.

1. You shouldn't screw in the new oil filter too _____. (tight/tightly)
2. Repeat this process _____to keep your engine running _____. (regular/regularly/good/well)
3. Be _____when riding a motorbike! (careful/carefully)
4. Lower the car to the ground _____. (slow/slowly)
5. I can't unscrew this nut. It's too _____. (tight/tightly)
6. Wait for the oil to drain _____. (complete/completely)
7. It's very _____to operate. A child could do it. (easy/easily)

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7. Describing a Graph

Work in pairs and practise vocabulary you have learned. For more detailed information, study the GROUP & PAIRWORK SHEET. In your description, use the phrases below:

The graph/chart shows…
The horizontal/vertical axis represents …
The horizontal/vertical axis is divided into … units/sections (, each representing …) …
The horizontal/vertical axis has a scale from …to …
The graph provides information about…
The chart compares …
Between 2005 and 2010 …
From 2005 to 2010 …
Over this period …
During this time…

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10_11_12 Unit 11A Task 3.

Recording 1 : The graph shows the number of cases of job-related accidents in our company between the years 1996 and 2010. As an overall trend, you can see that the number of cases is declining. This is caused by the safety measures we have introduced.

Recording 2: Between 1960 and 1965, the number of cases remained constant. It stood at approximately 100. That number rose steadily to 200 by 1970, and then more sharply to 500 in 1975. At this point the number of cases remained stable until 1981 before it started falling again.

Recording 3: In conclusion, the graph shows that the prices were gradually decreasing. There was only one steep fall at the beginning of last year.

14 Unit 11B Task 6.

Good morning, everybody. Let me introduce Mr. Andy Weatherall from the US Department of Energy. In today's seminar, he is going to talk about energy consumption and a possible new source of energy. I hope you'll learn something new and useful.

Thank you for the introduction. Let me start with a question. Have you seen your last year's energy bill? If so, you probably noticed that your utility bills rise every year. Is this just because the price of energy goes up all the time? Of course not. We have to admit that our energy consumption rises as well. Some outlooks say that energy consumption will double by 2045. As you know, not all resources are renewable. The possibility of an energy source running out has to be taken into consideration. The question is whether we are able to find some other sources of energy. And ITER might be the project that will give us the answer. This project, demonstrating the potential of fusion as an energy source, will be the world's biggest scientific collaboration of its kind and involve countries representing over half the world's population. We hope nuclear fusion may provide a safe large-scale energy source with a very low global impact on the environment.

15 Unit 11B Task 8.

Let me first give you an overview of what I am going to talk about. My presentation will be divided into four main parts. I'll start by touching on the history of the system, which has been known and used for several decades. After that, I will explain where the system is tested, in other words, what the purpose of the test facilities is. Next, I would like to tell you about the three main types of magnetic levitation. Then I will limit myself to the Transrapid Maglev System and focus on it in more detail. The understanding of its principle is necessary because all the benefits of the system follow from the non-contact magnetic levitation technology. Finally, we will take a look at the benefits of the maglev system in comparison to conventional high-speed trains. All the presented figures will be based on the measurements done at the Transrapid Test Facility in Emsland. After the presentation, you will be invited to ask questions.

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UNIT 11A GRAPHS

Visuals help speakers support the facts.
A chart is a graph, table or diagram.
A graph is a diagram showing the relationships between two or more things.

1. Complete the definitions with the correct option. Use each of the given expressions once.

column *circle* *bar* *line* *pie*

A (1)_____ and a (2)_____ graph show results that are one time, not continuous.
A (3) _____ or a (4) _____ graph is for showing individual parts of a whole or percentages. The graph is divided into the proportional amounts.
A (5) _____ graph is used for displaying data that changes continuously over time.

2. Sort out the expressions below into the given categories.

boom *climb* *continue down* *continue up* *peak* *cut* *soar*
reach a minimum *reach a peak* *hit the bottom* *not change* *rise*
fluctuate *reach a maximum* *remain/stay stable* *decline* *stand*
remain/stay constant *plummet* *dip* *level off/out* *decrease* *drop*
fall *rocket* *bottom out* *increase* *grow* *maintain the same level*

(1) go down:

(2) reach the lowest point:

(3) go up:

(4) reach the highest point:

(5) stay at the same value:

(6) go up and down repeatedly:

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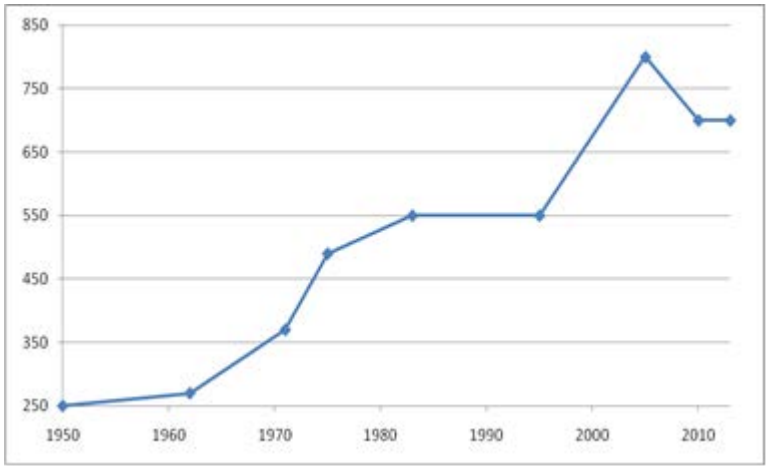
3. Have a look at the graph and fill in the missing words in the description.

at axis between by decreased due fluctuation level maximum of overall remained sharp to vertical

The graph/curve shows the number of fatalities in electrical engineering in the Tragic Republic (1) _____ the years 1950 and 2012. The horizontal (2) _____ shows the years and the (3) _____ axis shows the number of cases.
As an (4) _____ trend, the number rises continuously until the eighties, then maintains the same (5) _____ for approximately one decade before another (6) _____ increase in cases in the mid 90s, after which it falls slowly to the current 700 cases.

Initially, the number of cases stood (7) _____ some 250. That number climbed gradually (8) _____ about 270 by 1962. From 1962 to 1971 there was a rapid change (9) _____ roughly 100 cases. By 1975 the number soared sharply to 490 cases and then again to 550 cases by 1983. At this point the number (10) _____ stable until 1995. Then the number boomed (11) _____ 200 before reaching the (12) _____ at around 800 cases in 2005. After that, the number constantly (13) _____ and now there is a (14) _____ at around 700 cases.

The most critical period was around the year 2005, which was (15) _____ to the reconstruction of the power grid in the whole country.



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Structure of the description

The introduction defines what is described in the graph and summarizes the overall trend.

What the X-axis (horizontal) and the Y-axis (vertical) represent can be specified.

In **the body,** changes of the curve are described.

The conclusion summarizes the description with one or two sentences.

Language of the description of the course of the curve

A. Nouns and verbs

We can use a verb: *The number of cases **dropped** suddenly by 1950.*

We can use a noun: *There was **a** sudden **drop** in the number of cases by 1950.*

B. Prepositions

When we describe the difference between two values, we use **of** after a noun and **by** after a verb.

*As an overall trend, the number **rose** continuously **by** nearly 300 cases until the eighties… before another sharp **increase** in cases **of** 80% in the mid 90s.*

When we describe reaching the end point, we use **to**.

*That number climbed gradually **to** about 270 by 1962.*

*There was a gradual climb **to** about 270 by 1962.*

When we describe reaching a level we use **at.**

*... the number of cases stood **at** some 250...*

*... and now there is a fluctuation **at** around 700 cases.*

C. Adjectives and Adverbs

We modify a noun with an adjective (*a **sudden** drop*).

We modify a verb with an adverb (*to drop **suddenly***).

D. Approximation

When we don't give exact values, we can use expressions, such as **roughly, about, around, approximately, nearly, some.**

*...the number rose continuously by **nearly** 300 cases until the eighties, then maintained the same level for **approximately** one decade**…***

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4. Rephrase the following part of the description using related nouns or verbs. Do not forget to modify adjectives and adverbs as well.

The number rose continuously by nearly 300 cases until the eighties, before another sharp increase in the number of cases of 80% in the mid 90s, after which it has been falling slowly to the current 700 cases … Then the number boomed by 2002 before reaching the maximum at around 800 cases in 2005. After that, the number constantly decreased and now there is a fluctuation at around 700 cases.

UNIT 11A Key

1. (1) bar (2) column (3) circle (4) pie (5) line

2. (1) go down: decline, decrease, dip, drop, fall, cut, collapse, plummet, continue down
(2) reach the lowest point: hit the bottom, bottom out, reach the minimum
(3) go up: rocket, grow, climb, increase, rise, boom, soar, continue up
(4) reach the highest point: peak at, reach a peak , reach a maximum
(5) stay at the same value: remain/stay stable at, stand at, remain/stay constant at, level off/out at, not change, maintain the same level
(6) go up and down repeatedly: fluctuate

3. (1) between (2) axis (3) vertical (4) overall (5) level (6) sharp (7) at (8) to (9) of (10) remained (11) by (12) maximum (13) decreased (14) fluctuation (15) due

4. … There was a continuous rise in the number of nearly 300 cases until the eighties, before the number of cases sharply increased by 80% in the mid 90s, after which there has been a slow fall to the current 700 cases. … Then there was a boom in the number by 2002 before reaching the maximum at around 800 cases in 2005. After that, there was a constant decrease in the number and now it fluctuates at around 700 cases.

Vocabulary Unit 11A

about	okolo, kolem
again	zase
almost	skoro
amount	množství
approximately	přibližně
approximation	přiblížení
around	přibližně
at	na
axis	osa
bar chart	sloupcový/prožkový diagram
bar	řada
between	mezi
boom	rychle, výrazně narůst, zvýšit se
bottom	dno
bottom out	odrazit se ode dna
by	do, o
case	případ
circle	kruh, zakroužkovat
climb	šplhat
collapse	zřítit se, klesnout
column chart	sloupcový diagram
column	sloupec
conclusion	závěr
constant	konstantní, neměnný
consumer	spotřebitel
continue	pokračovat
continuous	pokračující
current	současný
curve	křivka
cut	omezit
decade	desetiletí
decline	snižovat se
dip	klesnout, změnšit se
direction	směr
divide into	rozdělit
drop	klesnout, snížit se
engine	motor
evolution	vývoj

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fatality	úmrtí
fluctuate	kolísat, měnit hodnotu
fluctuation	kolísání
from- to	od-do
gradually	postupně
graph	graf
grow	růst
hit	zasáhnout
household	domácnost
change	měnit
chart	graf, schéma
inappropriate	nevhodný
individual	jednotlivý
initially	původně
introduce	zavést
introduction	úvod
keep	udržovat
level	úroveň
level off/out	ustálit se
line graph	liniový diagram
line	linka
lower	snížit
maintain	udržet
maintain the same level	udržet stejnou úroveň
modify	změnit
nearly	skoro, téměř
noun	podstatné jméno
number	počet
nut	matice
operate	provozovat
option	volba
over this period	během tohoto období
peak	vrchol, dosáhnout vrcholu
percentage	procenta
period	období
pie	koláč
pie chart	koláčkový graf
plummet	prudce klesnout, spadnout
preposition	předložka
primary	primární
proportional	úměrný

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reach	dosáhnout
relationship	vztah
remain	zůstat
renewable	obnovitelný
rocket	vystřelit, prudce nárůst
roughly	zhruba
scale	stupnice
screw	šroub
sharp	ostrý
show	ukázat
soar	vyletět nahoru, prudce stoupnout
some	nějaký
sort out	třídit
stable	stabilní
stand, stood, stood	stát
stay	zůstat
steady	stabilní, plynulý
steep	příkrý
sudden	náhlý
suitable	vhodný
summarize	shrnovat
table	tabulka
tight	těsný
unscrew	odšroubovat
until	až do
value	hodnota
visual	vizuální
waste	odpad
whole	celý, celkový

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UNIT 11B Giving Presentations 1

1. Discuss the following questions in pairs.

Have you ever given a presentation? When?
What do you think you should avoid when giving a presentation?
Give some examples.

2. Look at the typical presentation structure. Put its parts into the correct order.

Overview _____
Conclusion _____
Introduction _____
Summary _____
Body (Main part) _____

3. Match the following descriptions to the stages above.

	Re-state the key points of your talk.
	Give the presentation in a clear, logical way. Stick to the overview. It is a formal occasion, so don't use colloquial language.
	Introduce yourself and arouse your audience's interest. Introduce your topic in a general way.
	Provide the structure of your talk and stick to it during your presentation. This will help the audience understand the main points and you will sound organized. Let your audience know how you are going to handle questions.
	Provide some sort of definite ending to the whole presentation. An effective way to do this is to state what follows from the presentation. Also, it's useful to relate the end of your presentation to your opening statement, reminding the audience of the aim of your presentation.

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3. Daniel Berkley is going to give a presentation on the Maglev System. Below, you can see the first slide of his presentation. How do you think he will start his presentation?

The Principle and Benefits of the Maglev System

4. Read the introduction to the presentation. Try to fill in the missing words. Then listen to the recording and check your answers. Finally, highlight any useful vocabulary and phrases.

Good morning, ladies and _____ (1). It's a pleasure to be here today. As you probably_____(2), the _____ (3) of today's seminar is the Maglev System.

Let me first _____ (4) myself. I am Daniel Berkley from the Siemens Corporation, and I'd _____ (5) to tell you about the principle and benefits of magnetically levitating trains. My _____ (6) is to provide you with all necessary explanations, so that you can fully understand all the benefits of the system. I personally _____ (7) that because this system is fast, environmentally-friendly, safe and economical, it will be widely _____ (8) in the future. For example, have you _____ (9) that the maglev train can reach speeds of up to 500 km/h? Or that the energy _____ (10) of the maglev train is only 67 per cent in _____ (11) with the Intercity Express trains? All this _____ (12) from the principle of the maglev technology, which will also be _____(13) in this lecture.

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5. The phrases below are mixed up. Match the items on the right to the items on the left.

1) Let me first	a) know, ...
2) As you probably	b) to be here today.
3) It´s a pleasure	c) introduce myself.
4) It's good	d) start by/with ...
5) Let me first	e) I will focus on …
6) In my presentation,	f) to see you all here.

6. Work in pairs and fill in the gaps with suitable words. The first letters are given as clues. Check with the recording.

Introduction to Presentation: ITER - A Step to a New Source of Energy

Good morning, everybody. 1) Let me i_____ Mr. Andy Weatherall from the US Department of Energy. In today's seminar, he is going to talk about energy consumption and a possible new source of energy. 2) I h_____ you'll learn something new and useful.

Thank you for the introduction. 3) Let me s_____ with a question. Have you seen your last year's energy bill? If so, you probably noticed that your utility bills rise every year. Is this just because the price of energy goes up all the time? Of course not. 4)We h_____ to admit that our energy consumption rises as well. Some outlooks say that energy consumption will double by 2045. 5) As you k_____, not all resources are renewable. The possibility of an energy source running out has to be taken into consideration. 6) The q_____ is whether we are able to find some other sources of energy. And ITER might be the project that will give us an answer. This project, demonstrating the potential of fusion as an energy source, will be the world's biggest scientific collaboration of its kind and involve countries representing over half the world's population. We hope nuclear fusion may 7) p_____ a safe large-scale energy source with a very low global 8) i_____ on the environment.

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7. Listening: Overview

Before you listen, answer the following question:

What is the aim of an overview?

8. Read the overview and try to fill in the missing words. Then listen to the recording and check your answers.

After	*ask*	*based*	*be divided*	*explain*	*focus*	*I would like to*
I'll start	*let me*	*limit*	*take a look*			

_____ (1) first give you an overview of what I am going to talk about. My presentation will _____ (2) into four main parts. _____ (3) by touching on the history of the system, which has been known and used for several decades. After that, I will _____ (4) where the system is tested; in other words, what the purpose of the test facilities is. Next_____ (5) tell you about the three main types of magnetic levitation. Then I will _____ (6) myself to the Transrapid Maglev System and _____ (7) on it in more detail. An understanding of its principle is necessary because all the benefits of the system follow from the non-contact magnetic levitation technology. Finally, we will _____ (8) at the benefits of the maglev system in comparison to conventional high-speed trains. All the presented figures will be _____ (9) on the measurements done at the Transrapid Test Facility in Emsland. _____ (10) the presentation, you will be invited to _____ (11) questions.

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9. Study the phrases below.

Overview:

- My presentation is divided into three main sections.
- First(ly), secondly, thirdly, finally …
- Right, first of all, I … Then/After that/ Next/ finally, …
- I will start by … -ing / I will start with … (+ a noun)
- Let me begin by …-ing
- Let me begin with … (+ a noun)
- Firstly, I´d like to …
- I'm going to…
- … take a look at…
- … talk about …
- …tell you something about …
- … give you some facts about …
- …concentrate on …/ focus on …

Questions:

- I'll be happy to answer your questions at the end of my presentation.
- There will be time for questions after the presentation.
- Please feel free to interrupt me if you have a question.
- If you have any questions during the presentation, don't hesitate to interrupt me at any time.

10. Read the overview again and replace the highlighted parts with suitable phrases from Exercise 9.

11. Work in pairs and choose one of the topics below. Prepare an introduction and overview for a presentation on the topic. Use appropriate phrases from 5 and 9.

Here is a list of possible topics for your presentation:

- How to prepare a cocktail
- How to change a light bulb
- How to make a transformer at home
- How to purchase an airline ticket
- How to choose the best computer
- How to use a digital camera
- How to download a film

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13 Unit 11B Task 4.

Good morning, ladies and gentlemen. It's a pleasure to be here today. As you probably know, the subject of today's seminar is the Maglev System.

Let me first introduce myself. I am David Berkley from the Siemens Corporation and I'd like to tell you about the principle and benefits of magnetically levitating trains. My aim is to provide you with all necessary explanations so that you can fully understand all the benefits of the system. I personally believe that because this system is fast, environmentally-friendly, safe and economical, it will be widely applied in the future. For example, have you heard that the maglev train can reach speeds of up to 500 km/h? Or that the energy consumption of the maglev train is only 67 per cent in comparison with the Intercity Express trains? All this follows from the principle of the maglev technology, which will also be explained in this lecture.

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14 Unit 11B Task 6.

Good morning, everybody. Let me introduce Mr. Andy Weatherall from the US Department of Energy. In today's seminar, he is going to talk about energy consumption and a possible new source of energy. I hope you'll learn something new and useful.

Thank you for the introduction. Let me start with a question. Have you seen your last year's energy bill? If so, you probably noticed that your utility bills rise every year. Is this just because the price of energy goes up all the time? Of course not. We have to admit that our energy consumption rises as well. Some outlooks say that energy consumption will double by 2045. As you know, not all resources are renewable. The possibility of an energy source running out has to be taken into consideration. The question is whether we are able to find some other sources of energy. And ITER might be the project that will give us the answer. This project, demonstrating the potential of fusion as an energy source, will be the world's biggest scientific collaboration of its kind and involve countries representing over half the world's population. We hope nuclear fusion may provide a safe large-scale energy source with a very low global impact on the environment.

15 Unit 11B Task 8.

Let me first give you an overview of what I am going to talk about. My presentation will be divided into four main parts. I'll start by touching on the history of the system, which has been known and used for several decades. After that, I will explain where the system is tested, in other words, what the purpose of the test facilities is. Next, I would like to tell you about the three main types of magnetic levitation. Then I will limit myself to the Transrapid Maglev System and focus on it in more detail. The understanding of its principle is necessary because all the benefits of the system follow from the non-contact magnetic levitation technology. Finally, we will take a look at the benefits of the maglev system in comparison to conventional high-speed trains. All the presented figures will be based on the measurements done at the Transrapid Test Facility in Emsland. After the presentation, you will be invited to ask questions.

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Unit 11B Presentations 1

What makes a good presentation:

- ✓ An interesting **topic**
- ✓ Good **articulation**, appropriate speed, appropriate stress and intonation, repetition, rhetorical questions
- ✓ A neutral style between formal and informal
- ✓ A well-organized **structure** (key points and support are clear)
- ✓ Using **visuals** (graphs, charts, maps, tables, diagrams, photos, animations, video, drawings, pictures, schemes, etc.)
- ✓ **Body language** (positive facial expression, natural gestures, good eye contact)

The Language of Presentations : Part 1

Introduction

Greeting
Good morning / afternoon, everybody / ladies and gentlemen.

Welcome
Welcome to today's seminar.
It's a pleasure to be here today.
It's good to see you all here.
I'd like to welcome you all here today.
I hope you'll learn something new and useful.

Introducing self: name, position
Let me (first) introduce myself. / I'd like to introduce myself.
I am Jan Nový and I study / I am a (distant) student at the Faculty of Electrical Engineering at the University of West Bohemia in Pilsen. I work as a technician in KOVO Dobřany.

Introducing the topic
The subject / topic of today's presentation is …
In this presentation, we will focus on / deal with ...
I'd like to present (you with) …
I'd like to tell you about …
as you probably know, ...

Aim / Objective (specifying the topic in greater detail)
My aim/objective is … (to provide you with all necessary explanations so that you can fully understand ...)

Attracting the attention of the audience
If you want to know more about … , you are in the right presentation now.
Let me ask you a question. /Let me start with a little survey / with a question.

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Have you heard … / Did you know that …?
The answer will be explained in this presentation.
I hope you'll learn something new and useful.

Overview / Outline

Introducing the structure

Let me give you an overview / outline of what I am going to talk about.
My presentation will be divided into … main parts.
I've divided my presentation into … main parts.

Structuring

First(ly), I will/am going to … / I'll start /begin by + -ing (touching on the history /…)
I'll start/ begin with + a noun (a brief explanation ...)

Second(ly), Third(ly), I will / am going to … / Then, Next, After that, I will / am going to …
Finally, I will / am going to … / I'll finish by + -ing / with + a noun

Presentation verbs

… I will / am going to touch on /explain /demonstrate/try to show/deal with/talk about/ speak about /tell you about / give you some information on/about / give you some background on /address the issue of / discuss /take a look at /give you some facts about/concentrate on/ focus on / limit myself to /describe /introduce...

Other information

E.g., All the presented figures will be based on the measurements done at …

Timing

My presentation will take / last …

Dealing with questions

If you have any questions, please feel free to interrupt me at any point.
I'll be happy to answer your questions at the end of my presentation.
I'll be happy to take any questions at the end of my presentation.
There will be time for (your) questions after the presentation.

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Vocabulary Unit 11B

able	schopný
admit	připustit
after that	potom
apply	aplikovat
arouse the audience's interest	vzbudit zájem publika
articulation	výslovnost
attention	pozornost
attract	přitahovat, přitáhnout
audience	obecenstvo
background information	teoretické informace
background	pozadí, zázemí, původ
be going to	chystat se, hodlat vyjádření plánované budoucnosti
believe	věřit
benefit	užitek, prospěch
brief	stručný
bulb	žárovka
clue	vodítko, nápověda
collaboration	spolupráce
colloquial language	hovorový jazyk
concentrate on	soustředit se na
conventional	obvyklý, tradiční
deal with	zabývat se
definite	konečný
department	oddělení
distatnt	dálkový
double	zdvojnásobit
draw sb's attention to	upozornit koho na, zavést něčí pozornost na
drawing	výkres, nákres
economical	hospodárný, finančně výhodný
ending	konec, zakončení
environmentally-friendly	ohleduplný k životnímu prostředí
etc.	atd.
example	příklad
explain	vysvětlit
explanation	vysvětlení
facial expression	výraz tváře
facility	zařízení
figure	číslo, údaj, počet
finally	nakonec
find, found, found	najít, zjistit
first of all	především
follow from	vyplývat z
fully	plně
future	budoucnost

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general	obecný	
gesture	gesto	
give a presentation	prezentovat	
greeting	pozdrav	
handle	vypořádat se s, naložit s, řešit	
hesitate	váhat	
highlight	zvýraznit	
hope	doufat	
impact	dopad	
in comparison with/tove	srovnání s	
in greater/more detail	podrobně	
invite	pozvat	
interrupt	přerušit	
intonation	intonace	
introduce	uvést, představit	
involve	zahrnovat	
issue	otázka, problematika; výtisk časopisu	
know, knew, known	vědět	
language	jazyk	
large-scale	velkého rozsahu	
last	trvat, vydržet	
later	později	
lecture	přednáška	
let, let, let	nechat, dovolit	v činném rodě následuje infinitiv bez “to”
limit myself to	omezit se na	
list	seznam	
missing	chybějící	
natural	přirozený	
next	další, příští	
occasion	příležitost, událost	
of its kind	svého druhu	
other	jiný	
outline	koncept, náčrt, osnova	
outlook	výhled, náhled	
per cent	procent	
personally	osobně	
pleasure	potěšení	
possibility	možnost	
possible	možný	
prepare	připravit	
present	předkládat, předat, prezentovat, líčit	
probably	pravděpodobně	
purpose	účel	
reach	dosáhnout	
relate something to	spojit s, vztáhnout k	
remind somebody of	připomenout komu co	
renewable	obnovitelný	

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repetition	opakování
resource	zdroj
re-state	zopakovat, znovu uvést
rhetorical question	řečnická otázka
run out	docházet
scientific	vědecký
self	sebe sama
slide	diapozitiv
sound	znít; zvuk
source	zdroj
specify	specifikovat
speed	rychlost
stage	etapa
state	uvést, oznámit, prohlásit, konstatovat, uvést, specifikovat, stav
statement	oznámení, tvrzení
step	krok
stick to, stuck, stuck	držet se (čeho)irr verb: stuck, stuck
stress	přízvuk
summary	shrnutí
survey	průzkum
take, took, taken	trvat, zabrat (časově)
take a (closer) look at	podívat se (blíže) na něco
technician	technik
then	potom
timing	časování
topic	téma
touch on	dotknout se čeho, zmínit co
transformer	transformátor
try	snažit se
understand, understood, understood	rozumět
understanding	porozumění
utility	technická, infrastruktura
way	způsob
welcome	vítat
widely	široce

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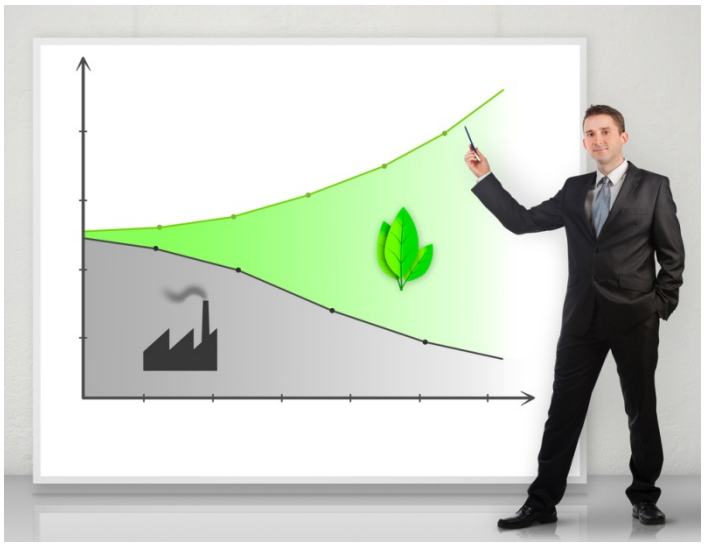
UNIT 12A Giving Presentations 2



1. Scan the opening of the main body of Daniel's presentation. Answer the questions below.

True or False?

1. The Maglev system was invented by several scientists independently.

Answer the questions.

2. In which countries is the system currently used?
3. Who received the patent in Germany?
4. Why is Daniel mentioning the history of the system's development?

Let me begin with some brief information on the history of the system. As you probably know, the maglev system is currently used in Germany, China, Japan, the USA, and Korea. But this doesn't mean that the idea of electromagnetic levitation is new. High speed transportation patents based on magnetic levitation were granted to various inventors throughout the world between the years 1902 and 1959. In Germany, for example, the Transrapid story began on August 14, 1934, when Hermann Kemper received a patent for the magnetic levitation of trains. The system has been developed for more than seventy years. It's been tested for operational safety and efficiency in order to prepare it for its commercial application. The reason why I find this important is that I would like you to realize we're now talking about a system which has been proved to be safe. I'll talk about this later in this seminar.

2. Imagine that you are taking part in the seminar. Listen to a part of the presentation about the Maglev test facility and take notes on the information that you find important. Focus on the questions below.

When constructed?

Visitors allowed?

Where located?

What tested?

Main parts:

Why?

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3. Signposting

The next part of the presentation focuses on the types and principles of the levitation technology. Below, you can see a list of sentences used in this part. The highlighted phrases are used to make the structure of your presentation clear, mark the change of slides and make the presentation run smoothly. Fill in the gaps with suitable words. There should be only one word in each gap.

1. **Now, let's have a closer** _____ **at** the three levitation techniques.
2. **If you look at the diagram carefully, you can** _____ **see** the differences.
3. **As you can** _____ **,** there are three primary types of maglev technology.
4. **First, let me** _____ **the principle of** electrodynamic suspension (EDS).
5. **Moving** _____ **to** electromagnetic suspension (EMS), it uses the attractive magnetic force of a magnet beneath a rail to lift the train up.
6. **We've just** _____ the three levitation techniques.
7. **On the previous** _____ **, you could see** the way the train is lifted above the guideway.
8. **Now,** _____ **me explain** how the vehicle is pulled along the track.

_____**this picture, you can see** the synchronous longstator linear motor of the Transrapid Maglev system.

9. **As I've** _____ **,** instead of a rotating magnetic field, a travelling magnetic field is generated in the windings.
10. **Here, you can see the principle of** the maglev trains´ propulsion **in more** _____.

4. Study the phrases below. Replace the phrases in bold in 3 with suitable phrases from the list.

Making the Structure Clear	**Introducing Visuals and Commenting on Them**
Beginning:	**Introducing visuals:**
Let's start by + -ing / Let's start with + noun	This graph shows you…
Let me begin by + -ing / Let me begin with + noun	If you look at this, you will see…
	I'd like you to look at this…
Changing the topic:	Now, let's look at …
I'd now like to move on to…	
Let me move on to …	**Commenting on visuals:**
Now, I'd like to look at…	As you can see from this table/graph…, …
	This clearly shows …
Referring back:	From this, we can understand how / why…
As I mentioned before, …	This area of the chart is interesting…
As I said at the beginning,…	I'd like you to look at … in more detail.
I'd like to go back to…	Let's look at this more closely.
	I'd like to draw your attention to …
Referring forward:	
We'll come to that later.	
This will be a subject of another seminar.	

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5. Summary and Conclusion

Read the transcript of the final part of Daniel's presentation. Complete the following tasks.

1. Identify the border between the summary and conclusion.

2. Underline the phrases useful for summaries and conclusions.

That brings me to the end of my presentation. Before finishing the presentation, let me sum up the key points I've talked about. At the beginning of the presentation, I tried to explain that the maglev technology has been developed and tested for more than seventy years. So now, it can be considered well understood and safe. In relation to this, I mentioned the test facility in Emsland and its purpose. After that, I discussed the three levitation techniques available, pointing out that electromagnetic levitation works on the principle of magnetic attraction. Next, I continued with the advantages that the non-contact levitation technology provides. I touched on the high operating speeds, the green nature of the technology, as well as its safety based on the operation control system. I hope that my presentation made the issue of maglev trains clearer and helped you overcome your fear of the system's application. I strongly believe that with its high ecological, safety and cost-efficiency standards, maglev technology will become the leading transportation system in the future. If you'd like to know more about maglev technology, help yourself to the information brochures over there or go through the following links. Thank you very much for coming. Now, if you have any questions, I'd be happy to answer them.

6. Divide the underlined phrases into the following three groups.

- **Phrases for summarizing the talk:**

- **Phrases for concluding:**

- **Phrases for inviting questions:**

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7. Dealing with Questions

Below you can see the questions the audience asked after the presentation. Listen to the answers and put the questions in the correct order.

_____a. But what about the serious accident in 2006? What was it caused by?
_____b. Can any cargo be transported on the MAGLEV train?
_____c. How is the safety of passengers ensured?
_____d. I've heard the maglev system is not suitable for short distances. Is that true?
_____e. No. Let me explain that. What I'm asking about is that if the distance is short, let's say, 6 kilometers, the train would not be able to reach the maximum speed.
_____**1**_____f. What's the function of the bendable switches?
_____g. Yes, but this is not the maximum speed, is it?

8. Listen again, fill in the gaps and circle the answers to questions that Daniel found difficult to answer.

1. Oh, I forgot to _____ this in the presentation. So _____ you for this question.
2. _____. If large cargo…
3. Well, I believe I've already _____ this. But never _____, I'll say that _____.
4. Are you _____ about the tragedy at the test facility?
5. Well, it _____ on what you think is a short distance.
6. I'm _____ I don't understand your question.
7. Well, if you want to know the length of the track needed to accelerate from zero to the maximum speed, I don't really _____. I'm afraid I don't have these facts_____, but what I _____ do is _____ and let you know _____.

9. Go back to Unit 11B, Exercise 5. Prepare a summary for your presentation.

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16 Unit 12A Task 2.

In order to develop and test the German Transrapid maglev system, a test facility was constructed between 1978 and 1991. You can see it in the diagram. It's located in Emsland and consists of three main parts: the North and South Loops and the high-speed section, as shown in the picture. On June 17, 1993, the Transrapid 07 achieved a record speed of 450 km/h in this section.

And now something you might be interested in. It's possible to see the test facility with your own eyes. Visitors can even get on the train and experience speeds of up to 500 km/h. In other words, the facility is open to visitors.

Of course, the speed is not the only parameter tested here. The measuring also focuses on energy consumption, magnetic field strengths, noise emission, etc. All of this is carefully monitored in order to ensure the system's safety.

17_18_19_20_21_22_23
Unit 12A Task 7.
Unit 12A Task 8.

A1: Oh, I forgot to mention this in the presentation. So thank you for this question. The bendable switches are used to change tracks, making the running of the train incredibly smooth.

A2: Sure. If large cargo is to be transported on the train, container sections with the capacity of fifteen tonnes each are used.

A3: Well, I believe I've already explained this. But never mind, I'll say it again. If the maglev train is on the track, the operation control system is immediately informed and that's why no other train is allowed to enter the track. And it's virtually impossible for the maglev train to derail.

A4: Are you asking about the tragedy at the test facility? Well, this incident of the maglev train was caused by human error. I don't believe it happened due to a control system fault because the vehicle location was constantly monitored. This means that the maximum was done for the passengers' safety.

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A5: Well, it depends on what you think is a short distance. The Transrapid requires less than two minutes and a stretch of only five kilometres to accelerate from zero to three hundred kilometres per hour.

A6: I'm afraid I don't understand your question. Are you asking about the maximum speed?

A7: Well, if you want to know the length of the track needed to accelerate from zero to the maximum speed, I don't really know. I'm afraid I don't have these facts here, but what I can do is find out and let you know later.

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Unit 12A Presentations 2

The Language of Presentations: part 2

Main Body of the Presentation

Beginning
Let's get started.
Let me begin with some brief information on / about …

Moving to the next main point
Another / The next / The second (area) …
The next point regards / concerns …
Let's turn to / move on to / go on to …
Now, I'd like to turn to / move on to / go on to …
Now, I'd like to go on / continue by / with …
Another / The next point I'd like to make is …
Now, let's take a closer look at …
Moving on from here, …
Now that we've looked at ..., let's move on to ...
Now that we've considered ..., let's look at ...

Commenting on visuals
The following slide shows …
Here, you can see … in more / greater detail.
This graph, chart, map, table, diagram, photo, animation, video, drawing, picture, scheme shows you…
If you look at this …, you will see…
I'd like you to look at …
As you can see from this…
As shown in the …
This … clearly shows …
From this …, we can understand / see how / why / that …
This area of the chart /… is interesting.
Let's look at this … more closely.
I'd like to draw your attention to …
Now, let's have a look at / take a closer look at …
If you look at this … carefully, you can clearly see the differences.
As you can see, there are … types of …
In this picture, you can see … / On this slide, you can see …

Emphasizing important points
I must emphasize that …
I'd like to underline the importance of…
Why is this (so) important? It's because...

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Summary

Signaling the end

That brings me to the end of my presentation.

Summarizing

Before finishing the presentation, let me sum up / summarize / go over the key points I've talked about.

Let me now briefly summarize / sum up the key points of the presentation. I've talked about…
Before we finish, I would like to sum up / summarize what I've talked about …
Before concluding, I'd like to summarize / sum up the key points again.
At the beginning of the presentation, I tried to explain …
First(ly), I talked about … / I started / began by / with …
Then I explained …
In relation to this, I mentioned …
After that, I discussed …
Next, I continued with …
I touched on … , as well as …
Finally, I… / I finished by…

Conclusion

Concluding

I hope that my presentation was interesting / made the issue of … clearer / helped you understand …
I'd like to conclude / close by …
In conclusion, I'd like to say …
Let me end up by saying …
I'd like to finish my presentation with ...
I hope you found this presentation useful.
I hope that this presentation has been useful.

Recommendation

I would recommend / advise that …
If you'd like to know more about … , go through the following links / visit the following webpage / read through the following materials /…

Sources

For my presentation I used the following sources …
On the last slide you can see my sources.

Closing

Thank you very much for coming / listening.

Answering questions

Now, if you have any questions, I'd be happy to answer them.
If there are any questions, I would be pleased to answer them.
Now I will be glad to answer your questions.

Handling difficult questions

I'm not sure I'm the right person to answer that question.
I don't really know the answer to that. Could we discuss it later?

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Vocabulary Unit 12 A

accelerate	zrychlit
achieve	dosáhnout
advice	rada nepočitatelné
advise	poradit
apparatus	přístroj
area	oblast
attraction	přitažlivost
attractive	přitažlivý
beginning	začátek
begin	začít
bendable	ohebný, pružný
beneath	pod čím
besides,…	kromě toho (navíc) except (for) – navíc (vyjma)
beyond	nad rámec
bold	tučné (písmo)
border	hranice
brochure	brožura
cargo	náklad
close	uzavřít
closing	uzavírání
comment on	okomentovat co
concern	týkat se
conclude	zakončit
concluding remark	poznámka na závěr
consider	zvážit, považovat za
consist of	skládat se z
cost-efficiency	efektivita nákladů
currently	v současné době
derail	vykolejit
draw sb's attention to	upozornit koho na, zavést něčí pozornost na
efficiency	výkonnost
emphasize	zdůraznit
enter	vstoupit
fear	strach
find out	zjistit
forget	zapomenout irr verb: forgot, forgot/forgotten
get on	nastoupit
glad	rád
go through	projít co, prolistovat
grant	udělit, přiznat (např. dotaci, patent)
guideway	vodicí dráha
handle	zvládat
handout	podklad pro přednášku, vytištěný materiál pro studenty

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I‘m afraid	bohužel
imagine	představit si
immediately	okamžitě
importance	důležitost
impossible	nemožný
invite	pozvat
in order to	aby
In other words,…	jinými slovy
In relation to this,…	v souvislosti s tímto
incredibly	neuvěřitelně
independently	nezávisle
invent	vyvinout
inventor	vynálezce
Last but not least,…	v neposlední řadě
leading	vůdčí
Let’s get started.	Začněmě.
let somebody know	dát komu vědět
lift above	zvednutý nad
lift up	zvednout
link	odkaz
loop	smyčka, oblouk
main body	hlavní část, stať
mean	mínit, znamenat
mention	zmínit se
move on to	přejít k, na
nature	povaha
never mind	nevadí
opening statement	úvodní/zahajovací řeč/prohlášení
operation control system	provozní řídící systém
operational	provozní
overcome	překonat
pleased	potěšený
point out	poukázat na
possible	možný
prepare	připravit
propulsion	pohon
prove	prokázat
pull along	táhnout podél
quotation	citace
quote	citát, citovat
rail	kolej
realize	uvědomit si
recommend	doporučit
recommendation	doporučení
regard	týkat se
remind sb of sth	připomenout někomu něco
repulsive force	odpudivá síla

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require	vyžadovat
research paper	výzkumná práce
re-word	přeformulovat
several	několik
significance	významnost, důležitost
signposting	nasměrování
smooth	hladký
speech	řeč
strength	síla
stretch	roztáhnout, zde: úsek
such as…	jako například
sum up	shrnout
sure	jistý, zajisté
suspension	zavěšení, závěs
talk	řeč, přednáška
template	šablona
that's why	proto
throughout the world	po celém světě
ton	tuna
track	trať
turn to	obrátit se k, na
underline	podtrhnout
understandable	pochopitelný
visitor	návštěvník

UNIT 12B REVISION

Revising for the final test

1. Listening

Listen and complete the tasks below. You will hear the recording twice. Now you have time to read the questions.

What is ITER?

Fill in the gaps.

ITER is an experimental reactor which will reproduce the (1) _____ reaction - fusion - that occurs in the sun and (2) _____ . Existing experiments have already shown that it is possible to replicate this process on Earth. ITER aims to do this at a scale and in (3) _____ that will demonstrate the scientific and technological feasibility of fusion as an energy (4) _____.

True or false?

5. It is hard to find basic fuels to start fusion on the Earth. _____
6. Nuclear fusion involves no CO2 greenhouse gas emissions. _____
7. Radioactive waste is a problem with nuclear fusion. _____

Answer the questions.

8. How many countries are engaged in the ITER project?

_____

9. In which year did they meet in Brussels?

_____

10. In which European country will the ITER reactor be built?

_____

Adapted from: http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/06/216

2. Use of English

Gap-filling. Complete the three conversations. Put more than one word in each gap.

1. OK, have a nice day and give _____
   _____to your wife. See you.
2. _____ a message?
   - Sure. Tell him I would appreciate his help with an abstract but I currently can't…
3. How about Monday the sixteenth? Are you free? - Well, I'm very _____
   _____ Monday. Tuesday is better.

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Rephrasing. Complete the sentence so that the meaning of each pair of sentences remains the same.

1. There was a quick drop in the world crude oil price from 1978 to 1981.
→ The world crude oil price _____.
2. They established safe working zones.
→ Safe _____.
3. Clearly display safety regulations.
→ Safety _____.

Gap-filling. Fill in the gaps with a correct form of the words in brackets.

1. An electrician was severely injured by a 22,000 Volt electrical supply while he_____ live apparatus in a substation. (climb)
2. Flammable solvent vapors can _____ by an electric spark. (ignite)
3. After finishing my Bachelor's degree, I _____ working for the Fluke Corporation. (start)
4. Have you already _____ the email to the manager? (write)
5. No activity _____start before the safety and health of employees is assured. (be permitted to)
6. The electricians wired the assembly line to the mains lead _____. (incorrect)

Gap-filling. Fill in the gaps. Put ONE word in each gap.

1. What is the principle _____ nuclear fission?
2. What are the conditions that should _____fulfilled to make fusion possible?
3. The total consumption is only 67 per _____ of the previous consumption.
4. In Germany, _____ example, the Transrapid story began on August 14, 1934.
5. Can you please tell him _____ call me back at 765 432 109?
6. What _____ they complained about?

Gap-filling. Fill in the gaps. Choose 6 items from the words listed below.

guarantees compares multiple technology techniques overview half-split begin afraid surely maintenance preventative summary summarize

1. Let me now _____ what we have covered in this seminar.
2. First of all, here is a brief _____ of what I am going to talk about.
3. I'm _____ I don't quite see what you mean.
4. All this _____ a high level of safety in the entire system.
5. The company I work with focuses on magnetic levitation _____ on trains.
6. A reactor of this type would have _____ targets that would be ignited in succession.

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3. Reading
Read the text and complete the tasks below.

The Maglev System
The super-speed maglev system Transrapid is an innovative track-bound transportation system for passenger and high-value cargo traffic at speeds between 300 and 500 km/h. It is the first fundamental innovation in railroad technology since the construction of the first railroad.

The super-speed maglev system has neither wheels nor axles nor gearing. It does not drive -- it hovers without touching the guideway, with no friction or wear. Electronics has replaced mechanical parts. The functions of wheel-on-rail, i.e. support and guidance, propulsion and braking, are taken over by an electromagnetic levitation and propulsion system. The Transrapid system works completely contact free. The levitation system, i.e. support and guidance, is based on the attractive forces between the electromagnets in the vehicle and the stator packs and side guidance rails in the guideway. In order to make the vehicle hover, the levitation magnets pull it toward the stator packs from below and the guidance magnets pull it to the side towards the guidance rails. The super-speed maglev system is propelled and braked by means of a long-stator linear motor. The method by which the linear motor functions can be derived from a conventional electric motor; the stator is cut open, stretched, and laid out along the entire length of the guideway on both sides. Alternating current in the cable windings generates an electromagnetic travelling field by which the train is pulled along without contact. By changing the intensity of the current, the thrust and speed of the train can be continuously varied. The motor can also be used as a generator which then brakes the train. Only the route segment in which a vehicle is moving is supplied with power.

The Transrapid concept with the guideway motor has two fundamental advantages: 1) the vehicle is significantly lighter; 2) the propulsion power can be precisely adjusted to exactly the necessary requirements. This means: at ascending slopes and acceleration sections, more power can be deployed to the guideway motor than, for example, on flat land.

True or false?
1. The Transrapid Maglev system is not suitable for high-value cargo transport. _____
2. The Maglev train moves entirely without contact with the rails. _____
3. The support and guidance system is mounted on the roof of the vehicle along its entire length. __
4. All route sections are constantly in operation. _____
5. Less power is needed on flat segments of the route. _____

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Answer the questions:

6. What has mechanics been replaced by?

_____

7. What is the levitation system based on?

_____

8. What draws the vehicle toward the stator packs from below?

_____

9. What is the long-stator linear motor, which propels the Maglev train, derived from?

_____

Find a synonym for the following word in the text:

10. levitate _____

Text adapted from www.transrapid.de

4. Writing

Look at the table. It gives specifications of three cell phones. Compare the cell phones in as much detail as possible. Use comparatives, superlatives and expressions showing comparison or contrast. Which of the three cell phones would you recommend and why? Write at least 8 sentences.

	Nokia E61	**Motorola W7**	**Samsung Preston**
Weight:	144g	105g	92g
Internal Memory:	64MB	30MB	80MB
Ringtone Type:	Polyphonic	Polyphonic, MP3	Polyphonic, MP3
Messaging:	SMS	MMS	Email
Instant Messaging:	SMS	EMS	MMS
Email:	SMS	MMS	Email
Call records:	+	+	+
Camera:	-	+	+
Radio: -	+	+	+
Talk Time:	Up to 7 hrs	Up to 8 hrs	Up to 3 hrs
Stand-by Time:	Up to 260 hrs	Up to 300 hours	Up to 300 hours

Vocabulary Unit 12 B

axle	osa
conventional	konvenčí, obvyklý (obecně užívaný)
employee	zaměstnanec
entire	celý, úplný
established	založený, stanovený
feasibility	proveditelnost(realizovatelnost)
fulfil	splnit, plnit
guidance	odborné vedení, odborná rada (při činosti)
hover	vznášet se
levitation	levitace
postpone	odsunout (časově)
propel	pohánět(něco kupředu)
quote	citovat
refuse	odmítnout, odepřít
replicate	zopakovat(pokus),
state	oznámit, prohlásit
summary	shrnutí, přehled

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