CPST FIRST YEAR SCIENTIFIC AND TECHNICAL ENGLISH COURSE

(SEMESTER 1)

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Introduction

This course was taught for two years by 10 ESP teachers. It was designed based on the broad guidelines set by the ministry of Higher Education and Scientific Research after a workshop that gathered ESP teachers from different schools in Algeria. Taking into consideration the relevance of topics, the available up-to-date references and the factor of time, ten lessons were selected from different technical English coursebooks and were adapted to the course objectives. These 10 lessons constitute the first semester's syllabus. Three grammar lessons were included as a consolidation for students' prior knowledge. Pronunciation points that are mentioned in the ministry's official syllabus are dealt with during the lesson in the classroom and are mentioned in each lesson's objectives. Video illustrations were used in each lesson and links are provided while the actual videos, pictures and listening materials are gathered in a DVD that is enclosed with this paper version. Yet, it might be worth noting that these videos need to be updated with time. Other teachers' feedback and remarks were taken into consideration during coordination meetings and informal discussions. As a result, some lessons were changed, some were added and some were omitted. Answer keys are included after each lesson for reference.

Ministry's Syllabus July 2015

Unité d'enseignement	Intitulé de la matière	code	semestre
UET11	Anglais1	ANG1	1

	Cours	TD	TP	Total	Crédit	Coefficient
VHS	22h30		/	22h30	1	1

Prerequsites

Objectives

- To help students understand basic vocabulary of science and technology.
- To help students use essential vocabulary of science and technology.
- To consolidate/reinforce grammar rules.
- To write meaningful paragraphs.
- To write coherent paragraphs.
- To answer written examination questions correctly.
- To read to grasp the general idea of a text.
- To read in order to find the main ideas within a text.
- To listen and comprehend basic functional scientific English.

Unit one: Diagrams and description of objects and devices (11h25)

1. **Topic one: diagrams and description of objects**
2. **Topic two: diagrams and description of devices**

Discovering language (language outcomes)	**Developing skills (skills and strategies outcomes)**
a) Grammar-pronunciation (3h30) - Present simple - Pronunciation of final 's' - Punctuation - The use of the 'ing' form - Expressing purpose - Link words **b) Vocabulary (3h25)** - Strategies for checking a monolingual dictionary - Study of a dictionary entry - Vocabulary used to express relationship between a whole and its parts or between a set and its members (including, making up) / (excluding, not being part of) - Language of measurements - Basic metric units - Derived metric units - Compound metric units - Describing shapes and dimensions	**a) Functions:** - Describing component shapes and features - Describing the function of a device - Composition of a diagram based on a description - Making statements about diagrams - Illustrating a text with diagrams - Expressing measurement - Expressing purpose **b) Listening & speaking (1h30)** - Listening to a presentation of a device - Listening for specific information, general ideas - Making inferences - Talking about a given device - Making a presentation of a device **c) Reading & writing (3h00)** - Reading - Reading for specific information, general ideas

	- Identifying referents of reference words - Guessing the meaning of words through context - Recognizing types of discourse - Discussing the organizational pattern of the text - Making logical links between sentences and paragraphs - Summarizing - Writing the description of a device

Unit two: Diagrams and Description of Processes (11h25)

1. **Topic one: How Technology Works**
2. **Topic two: How Energy is Produced**

Discovering language (language outcomes)	**Developing skills (skills and strategies outcomes)**
a) Grammar-pronunciation (5h25) - Present simple vs. continuous - Passive voice - Pronunciation of final 'ed' - Sequencers (first, next…) - Short-form time clauses - Relative pronouns - Short-form relative clauses **b) Vocabulary (1h30)** - Vocabulary related to processes - Definitions - Generalizations -	**a) Functions:** - Drawing and labeling a diagram of a process, using drawings and terms provided - Providing descriptions for processes illustrated by diagrams - Transformation of directions etc. into descriptions - Changing descriptions into sets of directions and statements of results. - Describing a process (using sequences) **b) Listening & speaking (1h30)** - Listening to a presentation of a process - Listening for specific information - Listening for general ideas - Recognizing and showing a sequence of events - Providing the sequencing of ideas - Talking about a given process - Managing through a long conversation by asking for clarifications, giving examples… - Making an oral summary of a

	process **c) Reading & writing (3h00)** - Reading - Skimming, scanning - Contextual reference - Rephrasing - Guessing the meaning of words through context - Analysis of paragraph links between sentences and paragraphs - Writing a descriptive essay (process

Bibliographic References:

- The Scientist Speaks: the English of Science and technology, the British Broadcasting Corporation, 1967.
- English in Focus: English in Physical Science, J.P.B. Allen, H.G. Widdowson, Oxford University Press, 1974.
- English for Science and Technology: Engineering, Tony Dudley-Evans, Tim Smart, John Wall, Longman, 1979.
- Ecrire l'anglais scientifique et technique, Sally Bosworth-Gerome, Robert Marret, Ellipses, 1994.
- Comprendre l'anglais scientifique et technique, Sally Bosworth-Gerome, C.Ingrand, Robert Marret, ellipses, 1992.
- Minimum Competence in Scientific English, Sue Blattes, Véronique Jans, Jonathan Upjohn, EDP Sciences.
- La communication scientifique en anglais, Alain Souillard, Françoise Souillard, BMS/ Langues pour tous, 2003.
- Communiquer en anglais : Guide pratique à l'usage des scientifiques, Dorothée Baud, Lauriane Hillion, ellipses, 2008.
- Professional English in Use : Engineering with Answers: Technical English for Professionals, Mark Ibbotson, Cambridge University Press, 2009
- English in Focus: English in Mechanical Engineering Engineering, ed: Eric H.Glendinning, Cambridge University Press, 1974.
- Flash on English for Mechanics, Electronics and Technical Assistance (Flash on English ESP), Sabrina Sopranzi, 2012.
- Longman Photo Dictionary, Longman, 2012
- Everyday Technical English, Valerie Lambert, Elaine Murray, Longman, 2003.
- English Grammar in Use, Raymond Murphy, Cambridge University Press, 2003.

Modalities d'évaluation:

Interrogation, devoir surveillé, examen final.

First Semester Curriculum

UNIT	NUMBER	LESSON
Diagrams and description of objects	1	Drawings
	2	Technical Drawing
	3	Present Tenses
	4	Information Technology
Diagrams and Description of Devices	5	Machine Tools
	6	Measurement
	7	Expressing Purpose and Result
Diagrams and description of processes	8	How Energy is Produced
	9	Passive Voice
	10	Computer Technology

REFERENCES

- Flash on English Mechanics, Electronics and Technical Assistance, Sabrina Sopranzi, 2012.
- Minimum Competence in Scientific English, Sue Blattes, Véronique Jans, Jonathan Upjohn, EDP Sciences 2003.
- Professional English in Use: Engineering, Mark Ibbotson 2009.
- Technical English Vocabulary and Grammar, Nick Brieger & Alison Pohl.

UNIT ONE: DIAGRAMS AND DESCRIPTION OF OBJECTS

LESSON ONE: DRAWINGS

Objectives :

- Learning vocabulary related to drawing (types of drawings, types of views)
- Reading for specific information.
- Guessing the meaning of words through context

Reference: Professional English in Use: Engineering (pages 8-9).

Pictures: GA, schematic, plan, elevation, section, exploded view, two-dimensional view, three- dimensional view, oblique, isometric projection.

Video: Line types:
https://www.youtube.com/watch?v=qpxNo_9Vk3U&index=7&list=PLRZaHqcLxMctuxRIVQ5KYxJBRu-kKYdZC

A. Drawing types and scales

In engineering, most design information is shown on **drawings**. Today, drawings are generally not drawn by hand. They are produced on computer, using **CAD (computer-aided design)** systems.

A key factor on a drawing is the **scale**- that is, the size of items on the drawing in relation to their real size. When all the items on a drawing are shown relative to their real size, the drawing is drawn to scale, and can be called a **scale drawing**. An example of a scale is 1:10 (one to ten). At **1:10**, an object with a length of 100 mm in real life would measure 10 mm on the drawing.

Most engineering designs consist of a **set of drawings** (a number of related drawings):

General arrangement (GA): drawings show whole devices or structures, using a **small scale**. This means objects on the drawing are small, relative to their real size (for example, a 1:100 drawing of an entire building).

Detail drawings show parts in detail, using **a large scale**, such as 1:5 or 1:2. Small parts are sometimes shown in a **detail** as **actual size** (1:1), or can be enlarged to bigger than actual size (for example, 2: 1).

For electrical circuits, and pipe and duct networks, it is helpful to show designs in a simplified form. In this case, **schematic drawings** (often referred to as **schematics**) are used.

B. Types of views used on drawings

Technicians are discussing different **views** shown on drawings (looking at components from above, from the side, etc.), as they search for information they require.

1. We need a view from above showing the **general arrangement** of all of the roof panels- **a plan** of the whole area.
2. According to the list, there are **elevations** of all four sides of the machine on drawing 28. So one of those should show the front of the machine.
3. There should be a **section** through the pipe, showing the valve inside, on drawing 36.
4. We need an **exploded view** of the mechanism, showing the components spaced out.
5. It's hard to visualize the assembly, based on **two-dimensional** elevations and sections. It would be clearer if we had a **three-dimensional** view, as either an **oblique projection** or an **isometric projection**.

Exercise 1: ***Complete the sentences. Look at A opposite to help you.***

1. Enlarged drawings show components larger than their …….. ……
2. For engineering drawings, 1:5 is a commonly used …….
3. Whole machines or structures are shown on …….. ……. drawings.
4. Electrical drawings don't usually show sizes. They're shown as …… .
5. A …….. of drawings for a large project can consist of hundreds of pages.
6. Most drawings are produced on computers, using ……. software.

Exercise 2: ***Match the descriptions (1-6) with the names of views used on drawings (a-f).***

1. A 2D view of the side of an object	a. a plan
2. A 2D view inside an object, as if it is cut through	b. a section
3. A 2D view, looking down on top of an object	c. an isometric projection
4. A 3D view, showing an assembly taken to pieces	d. an oblique projection
5. 3D view, with the 2D face of the object at the front	e. an exploded view
6. 3D view, with a corner of the object at the front .	f. an elevation

Exercise 3: ***Write the full forms, in words, of the abbreviations and shortened terms.***

1. GA: …… ……..
2. CAD: …….. ……. ……..
3. dwg: …….
4. 3D: ……..-……..
5. Section: ……..-……..
6. 1:50 …….. ……. ……..

<u>Exercise 4:</u> ***Complete the sentences, taken from conversations about drawings, using the words and abbreviations in the box.***

3D detail elevation GA plan scale schematic section

1. We need a …….. through the bridge, showing the profile of the deck.
2. The only drawing we have is the ……., which is 1:100, so it is obviously doesn't show things in detail.
3. On drawing 12, there's a large …….. of the entire top deck of the ship.
4. This is the …….. showing the front face of the tower.
5. Modern CAD systems can produce …….. drawings that look almost as realistic as photographs.
6. We don't need dimensions and positions at this stage. We just need a …… showing how many branches come off the main supply pipe.
7. We don't have a proper drawing. We've just got a rough sketch, which is not to ……..
8. The fixings aren't shown on the 1:50 general arrangement. But there's a ……., at 1:5, on drawing 42.

ANSWER KEY

1.1. Actual size, 2.Scale, 3. General arrangement, 4. Schematics, 5. Set, 6. CAD
2. 1f, 2h, 3a, 5d, 6c

3.1. general arrangement, 2. Computer-aided design, 3. Drawings, 4. Three-dimensional, 5. cross-section, 6. one to fifty

4.1. section, 2.GA,3.Plan, 4.Elevation, 5. 3D, 6.schemtic

LESSON TWO: TECHNICAL DRAWING

Reference: Flash on English for Mechanics, Electronics, and Technical Assistance (pages: 8-9)

Objectives:

1. Familiarize students with vocabulary related to technical drawing in English as they have a subject entitled "technical drawing" that they take in French.
2. Listening to a presentation
3. Vocabulary related to description of devices

Video 1: Types of Lines in Technical drawing

https://www.youtube.com/watch?v=_t2NjPpsegE&t=23s

Video 2: CAD/CAM CNC software and HAAS VF2 Machining Centre:
https://www.youtube.com/watch?v=tlY9UrP7uFc&index=1&list=PLRZaHqcLxMctuxRIVQ5KYxJBRu-kKYdZC&t=17s

Text

Technical drawing, also known as **drafting,** is the act and discipline of composing plans. The main purpose of technical drawing is to describe or explain all the characteristics of a product, giving all the necessary information that will help a manufacturer to produce that component. The visual image should be accurate in terms of dimensions and proportions, and should provide an overall impression of what an object is or does. It is a precise task requiring a high level of **skill** and suitable engineering tools. A **drafter** is the person who makes a drawing and who requires a wide knowledge of geometry, trigonometry and spatial comprehension and in all cases must be precise and accurate and give great attention to detail.

People who communicate with technical drawings use a visual language and technical standards that define practical symbols, perspectives and units of measurement. What are the tools and instruments used by a drafter in manual drafting? A **T-square, a protractor, a compass, rulers**, and **triangles**. Paper is also important and can be divided into layout paper, which is thin and fragile, and cartridge paper, which is heavier and more suitable for final drawings. Pencils used in drawing are graded from H to F depending on the **hardness**. The final drawing is made using a technical pen, graded according to the **point**, which must maintain the same line **width**. They are used with a range of stencils to add symbols, letters and patterns to the drawing. Rubbers remove pencils or pen writing mistakes are found. Correction fluid is used to mask text errors.

I. Read the text and choose the correct answer

1. Technical drawing is needed to …
   A. Make a scale of the product
   B. Practice pens, rulers and stencils
   C. Let the manufacturer understand the requirements
2. The drafter needs …
   A. Some paper and a pencil
   B. A wide range of technical instruments
   C. The final product
3. Paper is chosen considering …
   A. What sort of drawing the drafter is going to make
   B. The pencils he/she is going to use
   C. The drafter’s preference
4. Pencils are graded according to …
   A. Hardnss
   B. Hardness and colour
   C. Hardness and point
5. A technical pen …
   A. Makes regular lines
   B. Maintains the same line width
   C. Draws lines of the same length

6. When mistakes are found …
   A. We can't correct them
   B. They're removed with correction fluid
   C. Stencil can cover them

II. Listen and complete the text with words in the box:

Creation, advantages, boards, drawings, software, defects, faster, instructions, traditional, reduce, modification, electronically

CAD/CAM Systems

Drawing (1) ……. and manual drawing are not always precise and rapid: (2) …… design is usually slow, especially in its revision and (3) ……. For this reason manufacturing firms have **replaced** manual drawing with computer design (CAD) to **carry out** functions related to design and production. This computer technology assists the designer in the (4) ……., modification and analysis of a physical object. Nowadays computer (5) …….. can easily provide a three-dimensional drawing, which allows engineering designers to see how mechanical components may **fit** together without making models thus **saving** a lot of time. CAD is much (6) …….. and more accurate than manual drawing; designs can b quickly modified, reproduced and transmitted (7) …… . Computer simulated analysis of the model helps experts find problems and (8) …….. without building prototypes, in this way saving a lot of money and time. When the design is ready, the CAD system can generate the detailed (9) ……. needed to start product manufacturing. When CAD systems are linked to manufacturing equipment controlled by computers, they form an integrated CAD/CAM system. Computer-aided manufacturing (CAM) offers significant (10) …….. over traditional approaches by controlling manufacturing equipment with computers instead of human labour. CAM converts the design of a component into computer language and it gives (11) …… to the computer regarding machine operations.

Thanks to CAD/CAM systems it is possible to eliminate operator errors and (12) ……. manufacturing costs.

III. Read the text again and match each sentence with its ending.

1. CAD helps designers	a. seen from any angle and are easily manipulated
2. By using CAD technology	b. to draw, modify and correct designs
3. Unlike manual drawing, CAD	c. the design into computer language.
4. CAD allows us to save	d. defects can be easily found
5. CAD designs can be	e. provides three-dimensional drawings
6. CAM is the use of computer software	f. time and money
7. The CAM system turns	g. minimize errors and manufacturing costs
8. CAD/CAM systems	h. to control machine tools in the manufacturing process

ANSWER KEY

1. 1C, 2B, 3A, 4A, 5B, 6B.
2. 1. Boards, 2. Traditional, 3. Modifications, 4. Creation, 5. Software, 6. Faster, 7. Electronically, 8. Defects, 9. Drawings, 10. Advantages, 11. Instructions, 12. Reduce.
3. 1b, 2d, 3e, 4f, 5a, 6h, 7c, 8g.

LESSON THREE: PRESENT TENSES

Reference: Everyday Technical English Grammar and Vocabulary (pages: 66-67).

Objectives:

1. Review present tenses
2. Explain the difference between present simple and present continuous in meaning and use
3. Pronunciation of final (s)

Video 1: Practice the Simple Present with "Partners"
https://www.youtube.com/watch?v=thIBVUU1EuI

Video 2: Practice the Present Continuous with scenes from TV shows
https://www.youtube.com/watch?v=tVuVrVr4dvI

Video 3: Present perfect through movies, present perfect examples
https://www.youtube.com/watch?v=HpDQJSN-Pfc

Video 4: Understanding The Present Perfect
https://www.youtube.com/watch?v=IkzoLnV6XII&list=PLxt1Xkf3aWz2ladPsP0Z2L7olFYq7xDhN&index=3

Sample sentences

The logistics department dispatches finished goods to our customers and receives raw materials from our suppliers. Delivery documentation is enclosed with the consignment, but the shipping papers aren't prepared in this department. In this area here the goods are loaded onto trucks; and over there incoming goods which have just arrived are unloaded. A consignment is just being delivered over there. We have been using plastic packaging for many years; however, next year we are moving to more environmentally-friendly materials.

Form

	Positive	**Negative**	**Question**
Present simple active	We receive raw materials from our suppliers.	The supervisor doesn't prepare the papers.	Where do you store finished goods?
Present simple passive	All goods are received at the depot	The bill of loading isn't dispatched.	Where are the goods stored?
Present continuous active	The supervisor is checking the delivery.	I am not sending out a bill of loading with this	When are we moving to the new depot?

		shipment.	
Present continuous passive	Goods are being unloaded over there.	At present the pallets are not being reused.	Why are those crates being moved?
Present perfect active	Our contractor has built a supporting wall.	They have not drained the water yet.	How many tunnels have they dug?
Present perfect passive	The walls have been built.	The water has not been drained.	Has the cable been laid?
Present perfect continuous active	The supervisor has been checking the walls today.	I have not been working on that site since last year.	How long have they been excavating at the site?

Note: the present perfect continuous passive is very rare

Uses

The present tenses are used to express a range of meanings.

The present continuous describes:

1. An activity at or around the time of speaking.
   At present we are using plastic packaging
2. A fixed future plan
   Next year we are building a new depot.

The present simple describes:

A regular or characteristic happening

How often do you receive shipments?

The present perfect describes:

1. An activity at a non-specific time in the past
   Our contractor has built a new supporting wall.
2. An activity which started in the past and continues to the present
   We have been working on this project since last year.

Task 1: Choose the correct form in each of the following

1. In this process, the mixture (is heated/is heating) to 120°.
2. Once the salts (are dissolving/have dissolved), the heat is reduced.
3. Several people (have survived/are surviving the earthquake and are treating/are being treated in hospital at the moment.
4. For security purposes the employees change/ are changing their passwords regularly.
5. Up until now people in this area have taken/ take waste plastic to recycling centres, but at present we have tried/ are trying a curbside collection system.

Task 2: A journalist is asking some questions. Complete the answers by putting the verb in brackets into the appropriate present tense in the active or passive.

1. A: Do you normally hold those products in stock?

B: No. They ….are….normally ….made…..to order. (make)

2. A: Is the chief engineer here at the moment?
   B: I'm afraid not. He …….currently ……..the plant in the north of Scotland. (inspect)
3. A: Can I see the new design?
   B: Yes, of course. It …….just ……..off the production line. (come)
4. A: How many units do you produce a month?
   B: We …….. 5,000 units a month and only a very small number ……..(produce) (reject)
5. A: How long have you been using imported raw materials?
   B: We …….. (import) rayon for many years but we …….only just …….. (begin) using imported polyester.
6. A: Is this the natural colour of the fabric?
   B: No, this fabric …… (dye).
7. A: And how long will it be kept in store?
   B: Not long at all. We ……. (dispatch) this load tomorrow afternoon.

Task Three: Complete the following text with the correct form of the verbs in brackets.

Over the past ten years, this area (a) …… (experience) severe flooding. Houses (b) …… (damage) and roads (c) ……. (destroy). The local authority (d) …… (decide) to introduce a flood control system. At present our workforce (e) …….. (build) a dam on the west side of the town and dikes along the river bank (f) ……. (heighten). We must complete the work within two months, so at present we (g) …… (work) 24 hours a day. We (h) …… (believe) that these measures will solve the problem in the short term but on 1st May we (i) …….. (start) work on a new watercourse. The plans (j) ……already …… (draw up) and we (k) ……. (be) ready to start next week.

ANSWER KEY

Exercise 1: 1. Is heated, 2. Have dissolved, 3. Have survived, are being treated, 4. Change, 5. Have taken, are trying

Exercise 2: 1. Are, made, 2. Is, inspecting, 3. Has, come, 4. produce, are rejected, 5. Have been importing, have…begun, 6. Has been dyed, 7. Are dispatching

Exercise 3: a. has experienced, b. have been damaged, c. (have been) destroyed, d. has decided/decided, e. is building, f. are being heightened, g. are working, h. believe, i. are starting, j. have been drawn up, k. are

LESSON FOUR: INFORMATION TECHNOLOGY

Reference: Technical English Vocabulary and Grammar (pages: 14-15)

Objectives:

- Vocabulary specific to information technology
- Labeling a diagram using terms provided
- Vocabulary used to express relationship between a whole and its parts.
- Noun+ noun combination
- British versus American English IT vocabulary spelling

Pictures: desktop computer**,** laptop- mainframe, notebook, server, terminal, workstation, dot matrix printer, expansion card, inkjet printer,

Video 1: What is I.T? Information Technology

https://www.youtube.com/watch?v=cWNEZLbP9Lk

Information systems **collect, organize, store, process, retrieve** and **display** information in different formats (text, video, and voice). Information technology allows very fast, automated manipulation of **digital** data and their transformation from and to **analogue**.

Two basic technologies have been responsible for the development of the necessary **hardware**; **integrated circuits** and **digital communications**. Parallel advances have been made in **software**, particularly easy-to-use software products to **create, maintain, manipulate**, and **query** files and records. Many of these **software programs** are designed for use both **computer networks**.

As technology develops, new *models* and *types* of computer appear. At the heart of all computers is the hardware. However, without software, computers are just dumb boxes, unable to perform any calculations or operations.

Models and types of computer

Desktop-laptop- mainframe, notebook, server, terminal, workstation (pictures and explanation)

Computer hardware

CPU (central processing unit), dot matrix printer, expansion card, inkjet printer, keyboard, laser printer, monitor, mouse, RAM (random access memory), scanner, screen, storage devices.

Software

Applet, application software, browser, database software, email software, graphics software, operating system, search engine, spreadsheet, word processing

Many words in the field of IT come from American English. So you may see the following spellings:

British English	**American English**
Programme	Program
Analogue	Analog

The area of IT is developing very quickly; and the language to describe hardware, software and applications is also evolving at a high speed. As a result new noun + noun combinations often change to single nouns:

Noun + noun	**Single noun**
Lap top	Laptop
Note book	Notebook
Work station	Workstation
Desk top	Desktop

Exercise 1: Label the diagram

Exercise 2: Combine one word from A and one word from B and match it with the appropriate definition in C

A	B	C
Create	Products	A monitor will do this on a computer screen
Central	Information	This describes the format of 0 and 1 in which information is stored
Software	Processing unit	These enable a computer tp perform word processing, to create databases, and to manipulate numerical data
Display	Card	When two or more components are combined and then incorporated into a single package
Digital	Files	To make new programs, utilities or documents
Expansion	Network	A group of electronic machines connected by cables or other means which can exchange information and share equipment (such as printers and disk drives)
integrated	Data	The principal microchip that the computer is built around
computer	Circuits	You plug this into a slot to add features such as video, sound, modem and networking

Exercise 3: Complete each gap in the following text with a phrase from the table above.

1. The computer monitor will …….. ……...so you can see it on screen.
2. Information is stored on a computer as ……. ……
3. Spreadsheet and graphic software are examples of ……. …….
4. Digital communications and ……. ……have allowed developments in hardware to be made.
5. In order to organise data you should …….. ……..where you can store data.
6. When several computers are linked together you have a …… ……..
7. The part of the computer which interprets and carries out instructions is the …….. ……..
8. An …… ……..can be inserted in your computer to give your computer extra capabilities.

ANSWER KEY

Exercise 1: from left to right: printer, keyboard, monitor, screen, mouse, scanner, laptop, workstation
Exercise 2:
Create files: to make new programs, utilities or documents
Central processing unit: the principal microchip that the computer is built around
Software products: these enable a computer tp perform word processing, to create databases, and to manipulate numerical data
Display information: a monitor will do this on a computer screen
Digital data: this describes the format of 0 and 1 in which information is stored
Expansion card: you plug this into a slot to add features such as video, sound, modem and networking
Integrated circuits: when two or more components are combined and then incorporated into a single package

Computer network: a group of electronic machines connected by cables or other means which can exchange information and share equipment (such as printers and disk drives)

Exercise 3:

1)Display information, 2)digital data, 3)software products, 4)integrated circuits, 5)create files, 6)computer network, 7)central processing unit, 8)expansion card.

LESSON FIVE: MACHINE TOOLS

Reference: Flash on English for Mechanics, Electronics, and Technical Assistance (pages 10-11)

Objectives:

- Mechanical engineering vocabulary
- Listening to a presentation of a device
- Vocabulary related to processes
- Reading and listening for specific information

Video 1: Turning Machine (Lathe)

Video 2: Shaper

Video 3: Drilling Machine

Video 4: Milling Machine

Video 5: Grinding Machine

Video 6: Press

Video 7: Band Saw

A machine tool uses a power source to modify the shape of metal components of machines. It is a sort of machine used as a tool in the making of other machines. Machine tools were powered in the Middle Ages by humans and animals, and later by the energy captured by **waterwheels**. After the industrial Revolution, most machine tools were powered by **steam engine** and nowadays by electricity.

Machine tools can be operated manually, or under automatic control. In the 1960's, computers gave more flexibility to the process. Such machines became known as computerized numerical control (CNC) machines. They could precisely repeat sequences, and could produce much more complex pieces than even the most **skilled** tool operators.

Let's examine the main **features** of some of the most commonly used machine tools.

1. Turning machine

The engine **lathe** is the most important of all the machine tools. It is used to produce external or internal cylindrical surfaces. The piece is held by the machine and is rotated while a cutting tool removes excess metal from the external diameter. Internal turning consists of enlarging and finishing a **hole**.

2. Shaper

This is a metal-cutting machine used to produce or modify flat surfaces. The cutting tool moves cutting on the forward **stroke**, with the piece feeding automatically towards the tool during each return stroke. Shapers can be horizontal or vertical.

3. Drilling machine

It is used to produce circular holes in metal with w twist drill. It also uses a variety of other cutting tools to perform the basic hole-machining operations.

4. Milling machine

This cuts flat metal surfaces. The piece is fed against a rotating tool. Cutters of many shapes and sizes are available for a wide variety of milling operations. Milling machines may be manually operated, mechanically automated, or digitally automates via computer numerical control (CNC).

5. Grinding machine

This removes excessive material from parts that are brought into contact with a rotating abrasive wheel. Grinding is the most accurate of all the basic machining processes, but also the most time consuming.

6. Press

This is a machine tool that changes the shape of a workpiece. Historically, metal was shaped by hand using a hammer. Machine presses can be dangerous.

Bi-manual controls (controls which require both hands to be on the buttons to operate) are a very good way to prevent accidents.

7. Band Saw

It is a power tool which uses a **blade** consisting of a continuous band of metal with teeth along one edge. The band usually rides on two wheels rotating in the same plane. Band saws are used for woodworking, metalworking, or for cutting a variety of other materials, and are particularly useful for cutting irregular or curved shapes. A constant flow of liquid is poured over the blade to keep it **cool** and preventing it from **overheating**.

1. Read the texts about metalworking processes and complete the table

Machine tool	Final result	Description
Turning machine	External and internal flat surface	It removes excess metal from the external diameter. It enlarges and finishes a hole.
…..	Specific shape	It cuts flat metal surfaces
……	Holes	It uses a twist drill to make holes
…….	Flat surfaces	It cuts the piece
……	Specific shape	It changes the shape of a workpiece
……..	Cut pieces	It cuts various parts using a continuous band of metal with teeth
……	Finishing	It removes excessive material from parts

2. Read the texts again and decide if the following sentences are true (T) or false (F).

a. Turning machines remove excess metal from the external diameter and enlarge and finish a hole.

b. Shapers can only be vertical.

c. Drilling machines use a twist drill to make circular holes.

d. Milling machines can only be manually operated.

e. Grinding machines remove excessive material from parts.

f. Band saws use a band of metal with teeth to cut various parts.

g. Presses are not dangerous if operated by both hands.

3. Read the text about CNC and put the sentences in the correct order.

Computer Numerical control (CNC) refers to the automation of machine tools in manufacturing processes. The machines are controlled by computer software which carries out a series of operations automatically. The first NC machines were built in the 1940s and 1950s. They are used to cut and shape products, such as automobile parts that need precise specifications. Parts must be carefully planned and prepared by CNC programmers. First, they view the three-dimensional computer aided designed

part. Then they calculate where to cut, the speed and shape and select the tools and materials. The CNC programmers translate the planned machine operations into a set of instructions. These instructions are translated into a computer aided manufacturing (CAM) program containing a set of commands for the machine. The commands are a series of numbers which explains where to cut and the position of material. The computer checks all the operations made by the machine tools.

a. The planned machine operations are translated into a set of instructions.
b. These instructions are translated into a CAM program.
c. The program contains a set of commands for the machine.
d. It is calculated where to cut and tools and materials are selected.
e. The computer checks all the operations made by the machine tools.
f. Programmers view the part in its three-dimensional computer aided design.

ANSWER KEY

Exercise 1:

Machine tool	Final result	Description
Turning machine	External and internal flat surface	It removes excess metal from the external diameter. It enlarges and finishes a hole.
Milling machine	Specific shape	It cuts flat metal surfaces
Drilling Machine	Holes	It uses a twist drill to make holes
Shaper	Flat surfaces	It cuts the piece
Press	Specific shape	It changes the shape of a workpiece
Band saw	Cut pieces	It cuts various parts using a continuous band of metal with teeth
Grinding machine	Finishing	It removes excessive material from parts

Exercise 2: 1T, 2F, 3T, 4F, 5T, 6T, 7F

Exercise 3: 1f, 2d, 3a, 4b, 5c, 6e

LESSON SIX: HORIZONTAL AND VERTICAL MEASUREMENTS

Reference: Professional English in Use: Engineering (pages14-15)

Objectives:

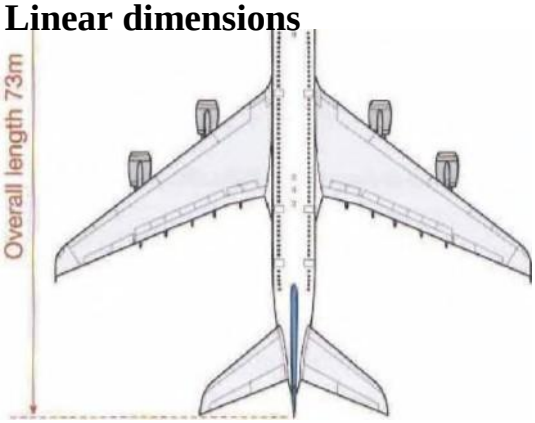
- Measurement and dimensions vocabulary
- Describing component shapes and features
- Silent letters (plumb)
- Making and oral summary of a process

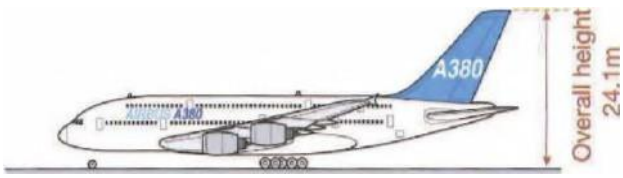
Video 1: Airbus A380 National Geographic Documentary HD

https://www.youtube.com/watch?v=uQpdhWVBw-0

Video 2 : Millau Viaduct, Aveyron, France
https://www.youtube.com/watch?v=ouwv9qutC1M

Linear dimensions





Wingspan 79.Sm

Maximum

fuselage width

The web page shows the key **dimensions** of the Airbus A380 in metres, and the explanations below it describe how they are **measured.** In the explanations, the word **plane** means an imaginary surface (not an aeroplane). On drawings, planes are shown as lines that indicate where dimensions are measured from and to, and are positioned to **strike** (touch) the **faces** (edges or surfaces) of components. Often, they are either **horizontal planes** or vertical **planes**.

Airbus A380 dimensions:

Overall length is a measurement of how long the aircraft is in total. The **measurement** is **taken** between the two points that are furthest apart (the front and rear **extremities**), **along the length** of the aircraft. The length is **measured along** a horizontal plane. It is the distance between a vertical pane striking the front of the nose, and a vertical plane striking the rear of the tail.

Wingspan is the total distance **spanned** by both wings. The **span** is measured as a straight line between the two wingtips.

Overall **height** measures how tall the aircraft is. The dimension is **measured vertically** between the underside of the wheels and a horizontal plane striking the top of the tail.

Maximum fuselage width is the **external width** of the aircraft's body – how wide it is, **measured horizontally** between vertical planes striking the outside faces of the fuselage.

Maximum cabin width states the maximum **internal** width, measured between the inside faces of the fuselage. The measurement is equivalent to the external width, less the thickness of the fuselage. The measurement is equivalent to the external width, less the **thickness** of the fuselage at each side of the aircraft.

Notes: when written, the words **dimension** and **dimensions** are often abbreviated to dim and dims. **Span** is also used to describe the distance (s) crossed by a bridge, between its supports. If a bridge has a support at its centre (as well as at each end), then it has two spans.

Level and plumb

If a surface is described as being **level**, this means it is both horizontal and **flat** (smooth). However, a surface which is flat is not necessarily horizontal. A flat surface may be vertical, or **inclined** (sloping **at an angle** to the horizontal or vertical plane).

Faces that are vertical, such as those of the walls of building, are described by engineers as being plumb. Structures that are slightly **inclined from** vertical are said to be **out of plumb.**

Exercise 1: Complete the key dimensions of the Millau Viaduct in France, using the words in the box.

(height, overall, thickness, span, width)

(1) …….. length: 2,460 m.
(2) Maximum ……. Between supports: 342 m.
(3) …….. of tallest support (ground tp deck): 245 m.
(4) …… of deck: 32 m.
(5) …… of deck; 4.2 m.

Exercise 2: Decide whether the sentences about Viaduct are true or false, and correct the false sentences.

a. The height of the towers is measured horizontally.
b. The overall span is measured along the width of the bridge.
c. The tops of the towers are at different levels, so a horizontal plane striking the top of one tower will not strike the tops of all the others.
d. The highest point of the structure is the top extremity of the highest tower.
e. The thickness of each tower decreases towards the top, so the faces of the towers are plumb.
f. The greatest thickness of each tower is its internal thickness at its base.

Exercise 3: Circle the correct words to complete the text about extra-high voltage (EHV) power lines.

On EHV transmission lines, cables- called conductors- (1) incline/span between pylons, which are described as supports. The conductors are suspended from the supports by rods, called insulators. On straight sections of line, the insulators are (2) level/plumb, hanging vertically from the supports. At supports where the direction of the line changes, pairs of insulators are used. In this situation, the insulators are (3) inclined/striking from the vertical plane, as they are pulled (4) plumb/out of plumb by the conductors pulling in different directions.

The higher the voltage being transmitted by the line, the greater the required distance between the conductor and the support, in order to provide effective insulation. The (5) length/width of insulators therefore varies, depending on the voltage. Higher voltages also mean that conductors must be located at a greater minimum (6) height/thickness above the ground, for safety. This distance is measured between the ground and the lowest point of the cable.

ANSWER KEY

Exercise 1: 1) overall, 2) span, 3) height, 4) width, 5) thickness

Exercise 2:

1) False: the height of the tower is measured vertically
2) False: the overall span is measured along the length of the bridge
3) True
4) True
5) False: the thickness of each tower decreases towards the top, so the faces of the towers are out of plumb
6) False: the greatest thickness of each tower is its external thickness at its base

Exercise 3: 2) plumb, 3) inclined, 4) out of plumb, 5) length, 6) height

LESSON SEVEN: SUBORDINATE CLAUSES OF RESULT AND PURPOSE

Reference: Technical English Vocabulary and Grammar (pages: 90-91)
Objectives

- Expressing purpose and result and knowing the difference
- Using them in a scientific and technical English context

Sample sentences

Benton have defined quality standards (in order) to meet minimum product specifications.
Last year Markham introduced new quality standards so (that) they detected defective product before completion.
Mansell have initiated a quality review programme so as to meet customer expectations.
We sample and monitor all processes so that customers' needs are exceeded.
For zero defects to be achieved, we will have to introduce tighter prevention controls.

Form

Clauses of result and purpose are subordinate clauses. There are three possible constructions:

1. (in order/so as) to+ infinitive
   Benton have defined quality control standards (in order) to meet minimum product specifications.
2. A subordinating conjunction followed by a verb
   We sample and monitor all processes so that customer needs are exceeded. (purpose)
   Last year Markham introduced new quality standards so (that) they detected defective products before completion. (result).

3. For+noun followed by an infinitive+ to
   For zero defects to be archived, we will have to introduce tighter prevention controls.
   For zero defects to be archived, we will have to introduce tighter prevention controls.
   (= so that zero defects can be achieved, we…)

The main subordinating conjunctions are: in order that – so that

Before the infinitive + to you can put: for – in order (to) – so as (to)

Note the negative forms:

So as not to pay for unnecessary reworking, we sample all raw materials.

In order not to lose customers, we have a policy of continuous process improvement.

Uses

Clauses of purpose answer the question why or what …for. They present the purpose of the information in the main clause.

Clauses of result also answer the questions: why or what…for? In contrast to clauses of purpose, they typically look to the past to see what result an action achieved.

Electricity is usually transmitted at the highest voltages possible to minimize energy losses. (purpose).

We tied together the electric utilities into large systems so that power was exchanged. (result)

Now look at the differences between the constructions in clauses of purpose and result.

1. We use to, in order to and so as to + infinitive when the subject of both clauses is the same.
   Energy is generated from different fuels in order to avoid reliance on one source.
2. We use so that or in order that where the subject of the clauses is different.
   Electricity producers are able to exchange power so that one utility can assist another
3. We use so that + clause for clauses of result.
   These electric utilities were then combined into larger systems so that power was exchanged.

Exercise 1: Rewrite the following sentences using the words in brackets

1. They introduced computer-guided robots because they wanted to increase efficiency. (in order to).
2. Close the valve. That way the system won't overheat. (so that).
3. Scientists are carrying out research. They want to find a cure for AIDS. (so as to).
4. Circuit breakers have been installed because they don't want the system to overload. (so that… not)

5. The system is sealed. They want to stop water and dust getting in. (in order to)
6. He is taking anti-malarial drugs. He doesn't want to get malaria. (so that)

Exercise 2: an architect is explaining the features of an ecological house to some interested builders. Complete the following description choosing phrases from the box.

Heat doesn't escape. Use too much power within the house. The temperature can be controlled. Produce power for the house. Provide insulation. Receive the maximum amount of sun. Save energy. Purify the air. Prevent the loss of heat. Be kept dry.

As you can see, there are several features in this house that have been designed to (a)…… but still provide a comfortable living area. On one side you can see a large glazed greenhouse that faces south so as to (b) ……. . it is in fact triple glazed in order to (c) …… . Inside this greenhouse, we would recommend plenty of green plants to (d) …… . Of course it can get quite hot on summer days so adjustable blinds are fitted on all the glass windows so that (e) ……. . Wind turbines and solar panels are fitted to the roof in order to (f) …….. . For the house (g) ……, the foundations consist of a concrete raft. The inner layer is made of expanded polystyrene which is used to (h) …… . the roof comprises concrete beams with a thick soil covering and grass so that (i) ……. Of course, there are also people in the house to generate a certain amount of heat too. In addition, so as not to (j) ……, low energy equipment and lighting are used.

ANSWER KEY

Exercise 1:

1) They introduced computer-guided robots in order to increase efficiency.

2) Close the valve so that the system doesn't overheat.
3) Scientists are carrying out research so as to find a cure for AIDS.
4) Circuit breakers have been installed so that they don't overload the system/ circuit breakers have been installed so that the system isn't overloaded.
5) The system is sealed in order to stop water and dust getting in.
6) He is taking anti-malarial drugs so that he doesn't get malaria.

Exercise 2:

a. Save energy
b. Receive the maximum amount of sun
c. Prevent the loss of heat
d. Purify the air
e. The temperature can be controlled
f. Produce power for the house
g. Be kept dry
h. Provide insulation
i. Heat doesn't escape
j. Use too much power within the house

LESSON EIGHT: HOW ENERGY IS PRODUCED

Reference: Flash of English for Mechanics, Electronics and Technical Assistance (16-19)

Objectives

- Vocabulary related to processes
- Improve reading skills (skimming, scanning)
- Passive voice in context

Videos 1: Inside a nuclear reactor core - Bang Goes The Theory - BBC
https://www.youtube.com/watch?v=MGj_aJz7cTs

Video 2: Top 10 Solar Power Producing Countries | 2016
https://www.youtube.com/watch?v=EaBmY7g-VIc

Video 3: Construction of the Largest Wind Farm in Southeast Asia
https://www.youtube.com/watch?v=b7_ix42ghCQ&t=14s

Conventional power plants

a. Nuclear Power Plants

About 10% of the world's electric power is produced by nuclear power plants. Nuclear power requires little fuel and causes much less air pollution than other power plants, but it can cause severe health and environmental problems when accidents occur, with a consequent release of radioactive material. This type of energy is produced by the splitting of atoms of uranium, which releases heat. This process- called fission- produces large amounts of steam, which is used to turn the blades of turbines thus creating energy. The

main problems with nuclear power are linked to the location of the power plants, as people are not willing to have these plants near their homes, and the disposal of waste material, which stays radioactive for centuries.

b. Thermoelectric Power Plants

They provide about ⅔ of the world's electricity. These plants burn fossil fuels, such as coal, oil or natural gas, which are all non-renewable resources. This means that in the future there will be a limited supply of these resources. The main advantage of thermoelectric power plants is that they are reliable and can meet the demand in peak periods. Electricity is generated by heating water in a boiler to create steam, which is then pressurised and used to turn the blades of giant turbines that produce electricity. These power plants cause environmental pollution because of the combustion of fossil fuels which release carbon dioxide.

c. Hydroelectric Power Plants

The energy produced by water can be captured and turned into electricity. The use of a dam on a river allows hydroelectric power plants to store water in an artificial lake, or reservoir. When released, the force of the water spins the blades of giant turbines, which are connected to a generator producing energy. Hydropower is one of the most important renewable energy resources, because it is reliable, efficient and does not pollute the air. Although it has high initial costs, it is cheap to operate. Unfortunately, it has a great impact on the environment, as humans, animals and plants may lose their natural habitat.

Exercise 1: Read the texts and decide if the following sentences are true (T) or false (F), then correct the false ones.

1. Nuclear power plants do not produce air pollution at all.
2. Accidents in nuclear power plants can have terrible consequences for the environment.
3. Nuclear power plants produce biodegradable waste material.
4. Thermoelectric power is generated by the combustion of renewable resources.
5. Thermoelectric power plants are environmentally friendly.
6. Dams are built on rivers to store water.
7. The water released from the reservoir flows through the generator.
8. The only disadvantage of hydropower is its high initial cost.

Alternative power sources

1. Read the text about alternative power sources and complete the table with the missing information

Environmental problems such as the greenhouse effect and air pollution have led scientists to find alternative power sources which are renewable and less polluting.

SOLAR ENERGY

Sunlight can be directly converted into electricity by solar cells made of silicon. When light strikes the cells, a part of it is absorbed by the semiconductor material. The energy of the absorbed light knocks electrons loose, allowing them to flow freely and produce electricity. The process of converting light (photons) into electricity (voltage) is known as the photo-voltaic process (PV). Solar cells are usually combined into panels and grouped into arrays. Even if the initial costs can be high, the PV system provides an independent, reliable electrical power source. It can produce energy for more than 15 years and its routine maintenance is simple and cheap.

WIND ENERGY

Wind energy is one of the cheapest renewable technologies available today. The wind turns the blades of giant turbines, producing in this way kinetic energy which is then converted into mechanical power and electricity by a generator. The main disadvantage of wind energy is that there are few suitable wind sites where it is possible to have a constant production of electricity.

TIDAL ENERGY

This alternative power source, which is typically used in coastal areas, turns the potential energy of tides into electricity. Tidal power generators use rising and falling tides in much the same manner as hydroelectric power plants. Large underwater turbines are placed in areas with high tidal movements and are designed to capture the kinetic energy of rising and falling tides. The turbines are driven by the power of the sea both when the tide comes in and when it goes out. The problem with tidal power is that only massive increases in tides can produce energy and there are very few places where this occurs. Moreover, the aquatic ecosystem and the shoreline can be damaged by the changes in the tidal flow.

GEOTHERMAL ENERGY

In the past, people used hot springs for bathing, cooking and heating. Geothermal energy is based on the fact that the Earth is hotter below the surface. The hot water which is stored in the Earth can be brought to the surface and used to drive turbines to produce electricity or it can be piped through houses as heat. This energy is cheap and has a low impact on the environment, but there are few sites where it can be extracted at low cost.

BIOMASS ENERGY

Biomass is a renewable energy source deriving from plant material and animal waste. When it is burnt, it releases its chemical energy as heat. Biomass fuels include forest residues (such as dead trees, branches and tree stumps), straw, manure and even municipal solid waste. Biomass energy is a natural process, it is carbon neutral and has low initial costs. It used to be the main source of heating at home in the past and it continues to be highly exploited in the developing world. The main disadvantage of biomass is that it has a smaller potential than other energy sources and requires excellent maintenance skills.

Type of energy	How it works	Advantages	Disadvantages
			High initial cost
Wind energy			
		It's a natural process because it exploits the potential energy of tides	

Exercise 3: Match the words with their definitions

1. Array	a. a spot where hot water comes up naturally from the ground
2. Kinetic	b. unwanted material left after using
3. Tide	c. a group of things arranged in a particular way
4. Hot spring	d. waste material from animals used as fertilizer
5. To pipe	e. the process of keeping something in good condition by regularly checking it
6. Manure	f. produced by motion
7. Waste	g. to send a liquid or a gas through a tube
8. Maintenance	h. the regular change in the level of the sea caused by gravitational attraction of the moon and the sun.

Exercise 4: Read the text about the electrical distribution system and complete it with the words in the box. Then listen and check.

Pole, demand, lower voltages, consumers, high-voltage, power plants, delivery, appliances, network, transformer

Electricity distribution is the final stage in the (1) ……..; of electricity to end users. In order to be able to use electric power for our daily activities, electricity must be transmitted from the (2)……..to other areas where it can be distributed to different (3)……. . The electricity generated by power plants is increased or stepped up at substations and distributed through (4) …….. transmission lines, in order to minimize energy losses and to economise on the material needed for conductors. Transmission lines use voltages as high as 765,000 vlots and they usually connected in a (5)…… This means that if a station receives an unexpected (6) …….. for electric power, it can call on the other stations to help to meet the demand. Then electrical power is converted from high voltage to (7)……. Thanks to step-down transformers which turn electricity into different power levels. Once it is sent to your neighbourhood, another small (8) …….; mounted on a (9)

…… converts the power to even lower levels to be used at home. The final voltage is between 110 volts- for lights, TVs, and other smaller appliances- and 240 volts for larger (10) ……

Exercise 5: Reorder the different stages in the distribution system and match them to the numbers in the picture.

a. Transmission lines carry high-voltage electricity to different substations.
b. Electricity leaves the power plant
c. Electricity is stepped down by transformers
d. Current at lower voltages is transmitted to homes and offices
e. The voltage is increased at a step-up station
f. Power levels are lowered by small transformers mounted on poles

Exercise 6: Read the text again and match each sentence with its ending

1. Power plants generate	a. convert electricity from high voltage levels to lower levels
2. Transmission lines are used	b. in case of an expected demand for electric power
3. High voltages mean	c. a reduction in energy losses during transmission
4. Step-down transformers	d. power and distribute it to substations
5. Substations can help each other	e. can be safely used in businesses and homes
6. The current transmitted by poles substations	f. to distribute high-voltage electricity to a network of

ANSWER KEY

Exercise 1:

1F: they produce less air pollution than other power plants
2T
3F: they produce waste material which stays radioactive for centuries
4F: it is generated by the combustion of fossil fuels, which are non-renewable resorces
5F: they cause environmental pollution
6T
7F: it flows through giant turbines
8F: the main disadvantage is its impact on the environment

Exercise 2:

Type of energy	**How it works**	**Advantages**	**Disadvantages**
Solar energy	***Solar cells made of silicon absorb sunlight, which knocks electrons loose, allowing them to flow freely and produce electricity***	***The PV system provides an independent, reliable electrical power source and its routine maintenance is simple and cheap***	High initial cost
Wind energy	***The wind turns the blades of giant turbines, producing kinetic energy which***	***It is one of the cheapest renewable technologies available today***	***There are few suitable wind sites***

	is then converted into mechanical power and electricity by a generator		
Tidal energy	***Underwater turbines capture the kinetic energy of rising and falling tides and turn it into electricity***	It's a natural process because it exploits the potential energy of tides	***Only massive increases in tides can produce energy and there are very few places where this occurs. Moreover the changes in the tidal flow can damage the aquatic ecosystem and the shoreline***
Geothermal energy	***The hot water stored in the Earth is brought to the surface and used to drive turbines to produce electricity or it can be piped through houses as heat***	***It is cheap and has a low impact on the environment***	***There are few sites where it can be extracted at low cost***
Biomass energy	***Plant material and animal waste are burnt in order to release chemical energy as heat***	***It is a natural process, is carbon neutral and has low initial costs***	***It has a smaller potential than other energy sources and requires excellent maintenance skills***

Exercise 3: 1c, 2f, 3h, 4a, 5g, 6d, 7b, 8e

Exercise 4: 1)delivery, 2) power plants, 3) consumer, 4) high-voltage, 5) network, 6) demand, 7) lower voltages, 8) transformer, 9) pole, 10) appliances

Exercise 5: 1b, 2 e, 3a, 4c, 5f, 6d

Exercise 6: 1d, 2f, 3c, 4a, 5b, 6e

LESSON NINE: PASSIVE VOICE

Reference: Technical English Vocabulary and Grammar (pages 76-77)

Objectives:

- Review passive and cases of use
- Passive use in technical English
- Pronunciation of final (ed)

Video 1: Practice the Passive Voice with scenes from TV shows
https://www.youtube.com/watch?v=dzeI93MszMk

Video 2: Practice the Passive Voice with scenes from TV series 2
https://www.youtube.com/watch?v=ycxcgYUtGvE

Sample sentences

For our research studies we normally produce a preliminary analysis, we then publish the findings and circulate them to various experts. This is exactly what we did when we applied for the current patent. We are therefore very surprised that you have contacted us in this matter. We can assure you that we completed all the relevant documentation. In the meantime we will investigate your claims further.

For our research studies a preliminary analysis is normally produced. The findings are then published and circulated to various experts. This is exactly what was done when the current patent was applied for. We are therefore very surprised that we have been contacted in this matter. We can assure you that all the relevant documentation was completed. In the meantime your claims will be investigated further.

Form

Every active sentence has at least two parts:

A subject (1) + an active verb form (2)

We (1) normally produce (2) a preliminary analysis

Every passive sentence has at least two parts:

A subject (1) + passive verb form (2)

A preliminary analysis (1) is normally produced (2)

Uses

We use the active verb form in speech and writing to describe actions and events. For example:

Paper still plays a vital role in our lives- newspapers tell us the events of the day, and books entertain and educate us. Paper has been with us since 105 A.D. the Chinese first used it to make records; later it spread to all parts of the world.

We can use the passive in the following situations:

1. **We are not interested in the doer**
   Ancient paper was made of rags; modern paper is made from wood pulp- a faster and cheaper alternative.
2. **In process descriptions**
   First the logs are stripped of bark, cut into smaller sections, and made into chips. The chips are put into a large tank called a digester and allowed to stew in a chemical mix under pressure. The wood pulp that is created by this process is then washed to remove any chemicals and pressed through screens to remove chunks and foreign objects. The pulp is then drained of water to form a mass that is then bleached and washed again.

The first two corresponding active sentences would be:

First we strip the logs of bark, then we cut them into smaller sections, and make them into chips. We then put the chips into a large tank called a digester and allow them to stew in a chemical mix under pressure.

3. In impersonal language

The chemicals in this process are toxic: safety clothing must be worn.

This is the typical style of a written order or instruction. The corresponding active sentence would be:

The chemicals are toxic; wear safety clothing.

Exercise 1: In the following sentences underline the verbs and decide if they are active or passive

1. A repeater boosts the electrical signal so that longer cables can be used.
2. Men's ties are usually made of silk or polyester.
3. Nearly all paper can be recycled if it is sorted and contaminants are removed.
4. Geothermal energy is produced below the earth's surface.
5. The main sources of greenhouse gas emissions include fossil fuel generating plants and transportation vehicles.
6. Manufacturers choose plastic containers for many different reasons.
7. Oil was formed in underground rocks millions of years ago.

Exercise 2: *Here is a list of changes which have taken place in a town between 1960 and today. Use these notes and the verbs given to write sentences to describe these changes.*

1960	**today**	**verb**
No hotels	Four hotels	Build
Wet land	No wet land	Drain
Small library	New library extension	Open
Three factories	No factories	Close
River polluted	River clean	Clean
Few offices	New office block	Build
No parks	Two parks	Establish
No airport	Plans for airport	Plan

Exercise 3: *In the following description of how plastics are shaped, put the verb in brackets in the correct form*

There are many ways of shaping plastics. The most common way is by moulding. Blow-moulding (a) …….(use) to make bottles. In this process, air

(b)……(blow) into a blob of molten plastic inside a hollow mould and the plastic (c) ……..(force) against the sides of the mould.

Toys and bowls (d)…….(make) by injection moulding. Thermoplastic chips (e)…….first ……..(heat) until they melt and then forced into a water-cooled mould under pressure. This method (f)……(suit) to mass production. Laminating (g)……..(produce) the heat-proof laminate which (h)……..(use), for example, for work surfaces in kitchens. In this process, a kind of sandwich (i)……(make) of layers of paper or cloth which (j)…….. (soak) in resin solution. They (k)……then ……..(squeeze) together in a heated press. Thermoplastics can (l)……..(shape) by extrusion. Molten plastic (m)……..(force) through a shaped hole or die. Fibres for textiles and sheet plastic may (n) …….(make) by extrusion.

ANSWER KEY

Exercise 1:
1) boosts (active; can be used (passive
2) are ….made (passive)
3) can be recycled (passive) ; sorted (passive) ; are removed (passive)
4) is produced (passive)
5) include (active)
6) choose (active)
7) was found (passive)

Exercise 2:
Four hotels have been built
The wet land has been drained
A new library extension has been opened
The factories have been closed
The river has been cleaned
A new office block has been built
Two parks have been established
A new airport is/has been planned

Exercise 3:

a. Is used	h. is used
b. Is blown	i. is made
c. Is forced	j. are soaked
d. Are made	k. are then squeezed
e. Are first heated	l. be shaped
f. Is suited	m. is forced
g. Produces	n. be made

LESSON TEN: COMPUTER TECHNOLOGY

Reference: Flash on English for Mechanics, Electronics and Technical Assistance (pages 28-33)

Objectives

- Describing features of devices
- Reading for specific information
- Detailed and complementary information to lesson 4

Video 1**:** History of computers - A Timeline (parts 1 and 2)
https://www.youtube.com/watch?v=pBiVyEfZVUU

https://www.youtube.com/watch?v=HRi1BHjID3o

Video 2: What is the World Wide Web?

https://www.youtube.com/watch?v=J8hzJxb0rpc

1. How much do you know about computers? Answer the following questions:

a. What is a computer?
b. What does a computer do?
c. What are the main components of a computer?
d. Have you got a computer at home? What type is it?
e. What do you generally use your computer for?

2. Read the text about computer components and complete the table

A computer is an electronic device that performs high-speed mathematical or logical operations and executes instructions in a program. Its main functions are to accept and process data to produce results, store information and programs and show results.

The main characteristics of these powerful machines are:

- Speed, as they can execute billions of operations per second
- High reliability in the elaboration and delivery of data
- Storage of huge amounts of information

A computer consists of hardware and software. The word hardware refers to all components you can physically see such as the CPU (Central Processing Unit), the internal memory system, the mass storage system, the peripherals (input and output devices) and the connecting system. Software, instead, comprises all the computer programs and related data that provide the instructions for a computer to work properly.

The CPU is the brains of your computer and consists of ALU (Arithmetic Logic Unit), which out the instructions of a program to perform arithmetical and logical operations, and CU (Control Unit), which controls the system and coordinates all the operations. In order to memorise input and output data, there is an internal memory that can be distinguished into volatile and non-volatile. Volatile memory is memory that loses its contents when the computer or hardware device is off. Computer RAM (Random Access Memory)is a good example of volatile memory. It is the main memory of the computer where all data can be stored as long as the machine is on. On the contrary, a non-volatile memory contains information, data and programs that cannot be modified, or can be

modified only very slowly and with difficulty. Computer ROM (Read Only Memory), for example, contains essential and permanent information and software which allow the computer to work properly. Memory storage devices are available in different options, sizes and capacities? These devices are extremely useful; they can be rewritten and offer incredible storage capacity, up to 256 GB. They can be magnetic (hard disks), optical (CDs and DVDs) or solid (flash memory cards).

Mass storage devices are available in an incredible number of options with different storage capacity up to 256 GB for some portable drives. A very popular type of removable device is represented by USB flash drives, which are much smaller and lighter than other portable drives, but which can still provide a huge storage capacity.

Component (acronym)	**Full name/ Description**	**Functions and properties**
Hardware	**…….**	**……..**
Software	**……..**	**……..**
CPU	**……..**	**……**
ALU	**……**	**…….**
CU	**…….**	**…….**
RAM	……..	……..
ROM	……..;	……..

3. Read the text about USB flash drives and fill in the gaps with the words in the box. Then listen and check

Plugged- backup-board-moving-disadvantage-operating system-case-of-site-water-pocket

A USB flash drive is a flash memory data storage device integrated with a USB (Universal Serial Bus) interface. USB flash drives are removable and rewritable, and they're small enough to be carried in a (1) …… . These portable drives are faster, have thousands of times more capacity, and are more durable and reliable than CD-ROMs because of their lack of (2) ……..; parts.

Unlike most removable drives, a USB drive does not require **rebooting** after it's attached, they are very robust and use very little power. They just need to be (3) …… into a USB port to work and they're compatible with any modern (4) …….., such as Linux, Mac OS X and Windows.

A flash drive consists of a small printed circuit (5) …….. carrying the circuit elements and a USB connector, insulated electrically and protected inside a plastic (6) ……

The drive is often used as a (7) ……. medium to save data, because it is very **user-friendly** and it can be carried (8) …….for safety despite being large enough for several **backups**. Moreover, flash drives are cheaper and less fragile than many other backup systems. Its only (9) …….is that it can be easily lost because of its size and it's easy for people without a right to data to take **illicit** backups. Some specially manufactured flash drives are provided with a metal or rubber case designed to be **waterproof** and almost unbreakable. It's been tested that these flash drives can retain their memory even after being submerged in (10) ……., put in a washing machine and run over with a car.

4. Find the synonyms for the following words in the text.

a. Long-lasting = ……
b. Sturdy = …….
c. Inserted = ……
d. easy to use = ……
e. fabricated = ……
f. hold = ……

5. Read the text again and decide if the following statements are true (T) or false (F), then correct the false ones.

1. Flash drives are provided with a very limited storage capacity.
2. They are lighter than other removable drives.
3. They need an external power supply to work.
4. USB flash drives are compatible with few operating systems.
5. A plastic case prevents the printed circuit board from being damaged.
6. USB drives are convenient for transferring data between computers or for personal backups.
7. They are more expensive than other backup systems.
8. Some models continue to work even after being accidentally dropped into water.

The Internet

6. Read the text and complete the sentences with the missing information.

The Internet is a worldwide information system consisting of **countless** networks and computers, which allow millions of people to share information and data. Thanks to the Internet it is now possible for people all over the world to communicate with one another in a fast and cheap way.

The Internet was first invented in the 1960s in the USA by the Department of Defence as an internal project to **link** computers. The Department wanted an extremely safe way of sending messages in case of nuclear attack. It was a British physicist, Sir Timothy Berners-Lee, who used it to make information available to everyone and created the most important media of the 21st century. In 1980 while working at CERN in Geneva- the largest particle physics laboratory in the world- he first thought of using hypertext to share and update information among researchers. Then in 1989-90 he produced a plan to link hypertext to the Internet to create the World Wide Web. He designed and built the first site browser and editor, as well as the first web server called httpd (hypertext transfer protocol deamon). Hypertext are the words or chains of words in a text we can click on to

be linked to new sites whose content is related to the words. But how does this global system work? It is a network of people and information linked together by telephone lines which are connected to computers. The applications are based on a client/server relationship, in which your computer is the client and a remote computer is the server. All you need to join this system is a computer, a normal telephone line, a modem and an account with an Internet Service Provider (ISP), a company that provides access to the Internet. A user buys a **subscription** to a service provider, which gives him/her an identifying username, a password and an email address. With a computer and a modem, the user can connect to the service provider's computer which gives access to many services, such as WWW (world wide web), emails and FTP (file transfer protocol).

1. The internet allows people to ……..
2. In the 1960s, the Internet was used ……..
3. Thanks to Sir Timothy Berners-Lee ……
4. He created the World Wide Web by linking ……
5. All you need to access the Internet is ……..
6. The ISP is ……

ANSWER KEY:

Exercise 1: personal answers

Exercise 2:

Component (acronym)	**Full name/ Description**	**Functions and properties**
Hardware	**Components you can physically see**	**Component**
Software	**Computer programs and related data**	**Provide the instructions for the computer to work properly**
CPU	**Central processing unit**	**Internal memory system**
ALU	**Arithmetic logic unit**	**Carry out the instructions of a program to perform arithmetical and logical operations**
CU	**Control unit**	**Control the system and coordinate all the operations**
RAM	**Random access memory**	**Store data as long as the machine is on**
ROM	**Read only memory**	**Contain essential and permanent information and software**

Exercise 3:

1) Pocket, 2) moving, 3) plugged, 4) operating system, 5) board, 6) case, 7) backup, 8) off-site, 9) disadvantage, 10) water

Exercise 4:

1) Durable, 2) robust, 3) plugged, 4) user-friendly, 5) manufactured, 6) retain

Exercise 5:

1. F: they have a huge storage capacity (up to 256 GB)
2. T
3. F: they don't require batteries
4. F: they are compatible with any modern operating system
5. T
6. T
7. F: they are cheaper
8. T

Exercise 6:

1. The internet allows people to share information and data and communicate in a fast and cheap way.
2. In the 1960s, the internet was used by the US Department of Defence to link computers
3. Thanks to Sir Timothy Berners-Lee, hypertext was used to share and update information among researchers
4. He created the World Wide Web by linking hypertext to the Internet.
5. All you need to access the Internet is a computer, a telephone line, a modem and an account with an internet service provider
6. The ISP is a company that provides access to the Internet