

1

GETTING STARTED

UNIT 1 • SOME HISTORY



1

Match the terms in *italics* on page 18-19 of New Mechways with their Italian equivalents.

- a. *abilità tecnica*
- b. *apice*
- c. *assistenza sanitaria*
- d. *causò*
- e. *continuò*
- f. *eccezionale*
- g. *flotta*
- h. *incoraggiare*
- i. *la più ricca*
- j. *legami*
- k. *officina*
- l. *passaggio*
- m. *per soddisfare le esigenze*
- n. *articoli esposti*
- o. *reddito*



2

Read the text again and answer the following questions.

- a. How important was the railway in Britain?
- b. Why did the request of coal increase?
- c. How did society change during the Second Industrial Revolution?
- d. What was the Great Exhibition? What did it represent?
- e. What type of exhibits was on display?
- f. What was the Crystal Palace like?
- g. How were the USA and Germany able to overtake Britain in the industrial race?
- h. How did Britain react to the economic decline?



3

In the following text find and highlight the English terms for the Italian words listed below.

THE VICTORIAN AGE: SOCIAL AND POLITICAL REFORMS

The 19th century was a period of important **social and political reforms**, most of them enacted during the reign of **Queen Victoria** (1837-1901).



Parliamentary Reforms

1832 Reform Act

Vote granted to male householders

1867 Reform Act

Vote extended to working class men

1872 Secret Ballot Act

Vote made secret

1884 Reform Act

Vote extended to male agricultural workers

Corn Laws

1815 Importation Act

Trade laws enacted to discourage imports of grain from abroad

1846 Importation Act

Corn laws repealed

Child Labour Acts

1802-1819 Children's working hours in factories and cotton mills limited to 12 hours a day

1833 Children's working hours reduced to 8 hours a day to children aged 9-11 and employed in textile industry; children under 9 no longer allowed to work

1842 Same limitations extended to children working in mines

1847 Adults' and children's working hours limited to 10 hours a day

Social Reforms

1834 The Poor Law Amendment Act

People in need expected to enter workhouses. Outdoor relief discouraged

1848 The Public Health Act

Authorities encouraged improvement of hygienic conditions and provision of urban areas with public water supplies, sewers and street cleaning

1870 The Education Act.

School districts established and new schools built

Education free and compulsory for children up to the age of 12

1871 Trade Unions legalised

1872 The Public Health Act

Responsible sanitary authorities identified in both urban and rural areas

- | | |
|--------------------------------------|---|
| a. <i>abrogate</i> | g. <i>fabbriche, stabilimenti</i> |
| b. <i>agrarario, agricolo</i> | h. <i>fognature</i> |
| c. <i>assistenza, soccorso</i> | i. <i>fornire</i> |
| d. <i>capifamiglia</i> | j. <i>miniere</i> |
| e. <i>concesso</i> | k. <i>obbligatorio</i> |
| f. <i>cotonifici</i> | l. <i>scoraggiare</i> |

UNIT 2 • ENERGY SOURCES



1

GROUP WORK. The class is divided into two groups, one in favour of Nuclear Energy, the other against. The two groups can be subdivided into smaller units each one containing 4-5 students. Then, the group/unit in favour will read the PROS of this energy source; the group/unit against will read the CONS. Finally, in turns they will discuss the advantages and disadvantages of nuclear energy.

PROS

Phenomenal energy output

Among the pros and cons of nuclear energy, this is the most important pro point. The energy produced in nuclear fission of fissionable material like Uranium-235, is 10 million times the energy obtained by burning the same mass of coal. Nuclear power generates a large amount of energy and is **cost effective**.

Low emission levels

Nuclear fission leads to almost zero greenhouse gas emissions. So compared to conventional energy sources, nuclear fission is very clean. The power generated from a nuclear plant does not contribute to environmental problems such as the greenhouse effect, acid rain or ozone layer depletion.

Reliable energy source

Nuclear energy is a comparatively reliable energy resource, unaffected by **strikes** and **shortages** around the world, as very little is required at one time and it is well-distributed around the world. It does not depend on fossil fuels and is not affected by fluctuating **oil** and gas prices.

CONS

Nuclear meltdowns and disasters

A nuclear meltdown occurs when there is an acute shortage of coolant water in the nuclear reactor. This can lead to disastrous consequences, causing a reactor equipment meltdown and exposing the environment to high dosages of radioactivity.

Radioactive exposure

The danger of radioactive exposure during mining and extraction of uranium looms in developing countries. The radioactive **rubble** and **debris** left after mining, if not properly disposed of, can lead to several diseases like cancer and mutation.

Radioactive waste disposal problems

The safe disposal of radioactive waste is a major problem. Fission of a material like uranium leaves **by-products**, which are themselves radioactive and highly harmful to the environment. Radioactivity cannot be turned off and therefore there is no way **but** to **bury** radioactive waste, without leading to extra complications.

A catalyst for nuclear weapons proliferation

Nuclear breeder reactor programs are often a smoke-screen for the development of nuclear weapons. There is no guarantee that fissionable nuclear fuel supplied to a country will not be used to produce weapons of mass destruction like atomic or hydrogen bombs.

GLOSSARY



to bury: seppellire
but: (qui) tranne
by-product: derivato
cost effective: vantaggioso economicamente
debris: rottami, scarti

nuclear breeder (reactor): un tipo di reattore nucleare che produce plutonio
oil: petrolio
rubble: macerie
shortage: carenza
strike: sciopero



Nuclear cooling towers

■ AC/DC ELECTRICITY AND GENERATORS



Batteries produce **direct current**, or DC, electricity. The current flows in the same direction all of the time, as shown by the typical voltage-time graph (Figure 1).

Most generators (**alternators**) produce **alternating current**, or AC, electricity. The current reverses direction regularly, as shown by the typical voltage-time graph (Figure 2).

Mains electricity is AC and electricity for industrial and civilian use comes mostly from AC generators driven by steam turbines. It has a voltage of 220/240V. A **generator** is a device which converts mechanical energy into electrical energy.

When a magnet is moved in a **coil of wire**, it generates a **voltage**. This process is called **induction** and was discovered by Michael Faraday in 1831. In order to generate large amounts of electricity generators induce a current by **spinning** a coil of wire inside a magnetic field. As this happens, a **potential difference** is produced between the ends of the coil, which causes a current to flow. The current produced by the voltage is led to an external circuit, where it **actuates** devices that require electricity. In the simplest form of generator, an open coil of wire rotates between the poles of a permanent magnet. During a single rotation, one side of the coil passes through the magnetic field first in one direction and then in the other, so that the induced current is alternating current (AC), moving first in one direction, then in the other. In an AC generator, each end of the coil is attached to a metal **slip ring** connected, by means of brushes, to a terminal of the external circuit. If a **commutator** is used in place of the slip rings, **direct current** (DC) is obtained – this device is called a **dynamo**. In any generator, the whole assembly carrying the rotating coils is called the armature, or rotor, while the stationary parts constitute the stator.

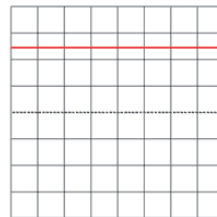


Figure 1

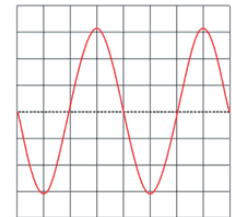
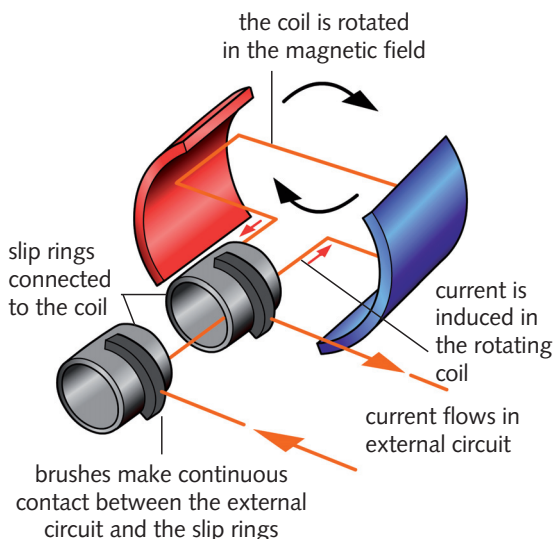


Figure 2




GLOSSARY



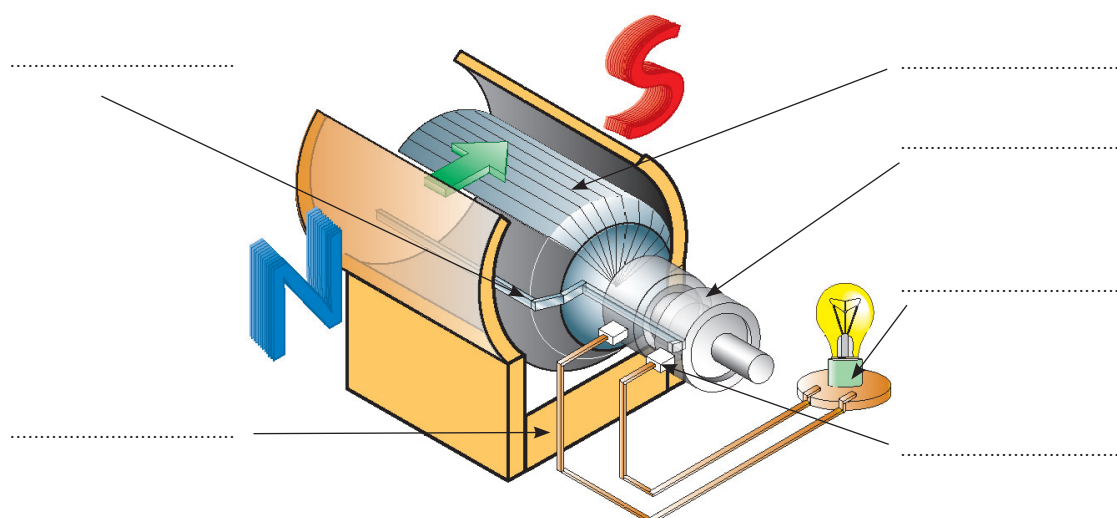
- to actuate: azionare
- coil: bobina
- mains electricity: energia (elettrica) di rete
- slip ring: collettore
- to spin: (fare) girare, ruotare
- wire: filo elettrico

 **2** Answer the following questions.

- How does current flow in a battery?
- What kind of current is AC?
- When is voltage or potential difference produced?
- What is the mains supply to our homes?
- What is a simple AC generator made up of?
- What is a dynamo?

 **3** Look at the picture of a generator and name the different parts. Then write what function they have.

- a. magnet b. coil of wire c. slip ring d. brush e. armature f. bulb



- | | |
|---------|---------|
| a. | d. |
| b. | e. |
| c. | f. |

 **4** In the passage find the English form for these Italian words.

- avvolgimento:
- spazzola:
- filo:
- magnete:
- campo:
- collettore ad anello:
- rotore:
- statore:



5

In the passage find the opposite of these words.

- a. different:
- b. lowest:
- c. small:
- d. outside:
- e. internal:
- f. the most complex:
- g. temporary:
- h. atypical:

TRANSFORMERS

A transformer is an electrical device that changes the voltage of an AC supply: it changes a high-voltage supply into a low-voltage one, or vice versa. Transformers do not work with DC supplies.

A transformer that increases the voltage is a **step-up transformer**; one that decreases it is a **step-down transformer**.

A transformer consists of a pair of electrically insulated coils **wound** around an iron core. The AC in one coil produces a **changing magnetic field** which induces a voltage in the other coil of the transformer. These two coils are called the primary **winding** and the secondary winding. The primary winding is connected to the source of voltage (input voltage) which has to be changed, while the secondary winding supplies the output voltage that may be higher (step-up transformer) or lower (step-down transformer) than the input voltage. Transformers are frequently classified according to their uses. Power transformers are generally used to transmit power at a constant frequency. Audio transformers are designed to operate over a wide range of frequencies with a nearly constant ratio of input to output voltage. Radio frequency (RF) transformers are designed to operate efficiently within a narrow range of high frequencies.



6

Answer the following questions.

- a. What is the function of a transformer?
- b. How can transformers operate on alternating current?
- c. Do transformers work with AC and DC supplies?
- d. What is the difference between a step-up and a step-down transformer?
- e. What is needed to produce a voltage in a transformer?
- f. What does a transformer consist of?
- g. What is the primary winding connected to?
- h. What kind of transformer do you need if you have to work over a wide range of frequencies?
- i. What are power transformers used for?
- j. What are audio transformers used for?

GLOSSARY



- to step-down: diminuire
- to step-up: aumentare
- to wind (wound-wound): avvolgere
- winding: avvolgimento

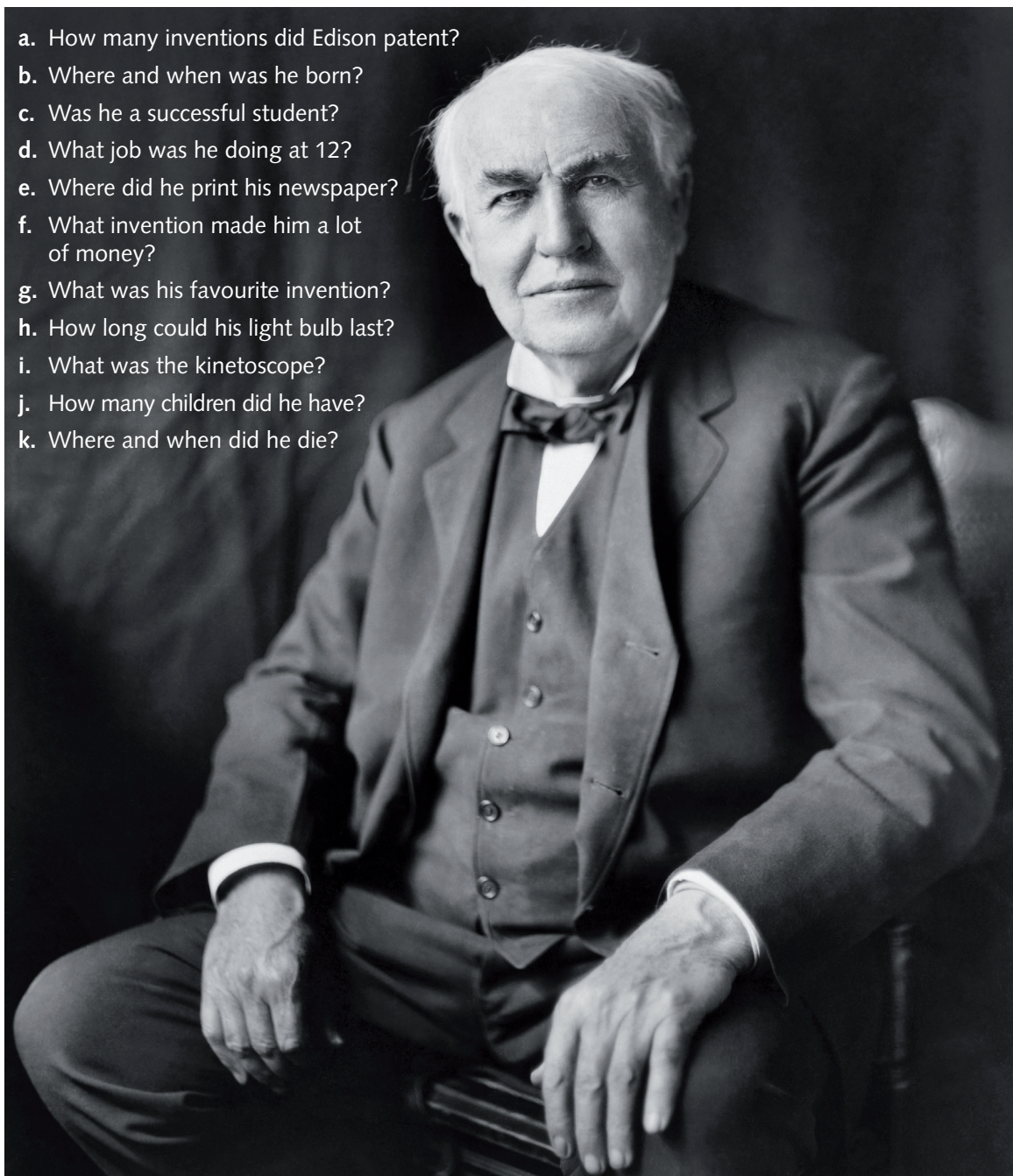
■ THOMAS EDISON'S LIFE



7

Listen to a recording about Edison's life and answer the questions below.

- a. How many inventions did Edison patent?
- b. Where and when was he born?
- c. Was he a successful student?
- d. What job was he doing at 12?
- e. Where did he print his newspaper?
- f. What invention made him a lot of money?
- g. What was his favourite invention?
- h. How long could his light bulb last?
- i. What was the kinetoscope?
- j. How many children did he have?
- k. Where and when did he die?





8

You have found this article about ways to save energy at home. Make up a dialogue with your partner following the hints given.

TEN ENERGY-SAVING TIPS FOR YOUR HOUSE

1. Use Fluorescent Bulbs. Replace conventional incandescent **light bulbs** with compact fluorescent light bulbs (CFLs). They cost a little more, but last up to 10 times longer, use two-thirds less energy and **give off** less heat.

2. Look for the AAA Label. AAA-qualified home appliances use about half as much energy as old and unqualified ones.

3. Get Unplugged. Many home electronics still consume energy even when they are turned off. Many devices with a “stand-by mode” will continue to use power. Also, chargers and power adapters continue to draw power from the wall **socket** even if the device is not attached.

Unplug these devices to make sure that you aren’t wasting energy.

4. Double-Up on Windows. Replacing old single-**pane** windows with double pane-windows helps reduce heat loss in winter and heat **gain** in the summer.

5. Turn Down the Thermostat. Lowering

your thermostat by just one degree can reduce costs by about four percent.

6. Sustainable Floors. Cork floors not only look great, but cork is also a natural insulator. So when you consider purchasing flooring, consider using bamboo, cork or another sustainable material.

7. Earth-Friendly **Decks**. A lot of deck material comes from tropical forests. These woods look great and are resistant to the weather for a very long time.

8. Low-Flow Taps. Low-flow water fixtures such as showerheads, taps and toilets reduce water consumption and water heating costs by as much as 50 percent.

9. Buy Renewable Energy. Check with your local company and see if you can buy renewable energy.

10. Recycle! After you replace all those inefficient windows and **fixtures**, make sure you recycle all that metal and glass. By recycling half of your **household** waste, you can save 2,400 pounds of carbon dioxide annually!

HINTS

- A. Complain about your last electricity bill and ask for advice.
- B. Say that you’ve found an article about how to save energy in your house and that you’ve started doing what was suggested.
- A. Ask for examples.
- B. Say you replaced old bulbs with new ones.
- A. Say you also have to buy a new washing machine because the old one is not working.
- B. Give advice about energy-saving home appliances, and warn about the stand-by mode.
- A. Express surprise. Say you didn’t know.
- B. Ask about A’s windows (single-pane or double-pane?).
- A. Answer. Ask why.
- B. Answer.
- A. Ask if B has any suggestions for saving money on heating the house.
- B. Answer. Add suggestions about insulating floors.
- A. Ask about how to save water.
- B. Answer. And give advice about renewable energy and recycling.
- A. Thank.



GLOSSARY



deck (AmE): pavimento esterno

fixture: impianto fisso

gain: guadagno

to give off: rilasciare, emettere

household: domestico

light bulb: lampadina

pane: (lastra di) vetro

socket: presa a muro

tip: consiglio