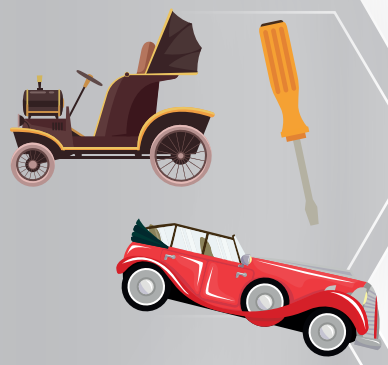

LESSON 04 Scenario

electrical engeneering

electric motor

Erasmus+

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1 Topic of Today

- Write the topic of today on the blackboard
- Accessing the existing knowledge

Electric Motor – A Brief Introduction

2 Key Words

- Write up any key word from the text and give the translation in the mother tongue or explain the words in English. Ask students to listen and repeat in English.

wire winding - force - direct current - alternating current - power grid - horseshoe magnet - armature - rotor - stator - coils - brushes - plug - polarity

3 Experiment

- Electric Motor is a rather difficult task. You can start with an experiment to get attention and to make your student understand more easily.

Electricity, magnetism and movement
You take a length of ordinary wire, make it into a big loop and lay it between the poles of a powerful, permanent horseshoe magnet. Now if you connect the two ends of the wire to a battery, the wire will jump up briefly. (3)

- After the experiment you can explain the reaction.

The scientific explanation:
When an electric current starts to creep along a wire, it creates a magnetic field all around it. If the wire is near a permanent magnet, this temporary magnetic field interacts with the permanent magnet‘s field. Two magnets placed near one another either attract or repel. In the same way, the temporary magnetism around the wire attracts or repels the permanent magnetism from the magnet, and that‘s what causes the wire to jump. (4)

4 Exactly fifty words

- Choose the text you want your students to understand and remember.

1) Give your students the text and ask them to read it through once to get the gist of it. Give them a time limit.

2) Ask them to read it again, but this time to underline the key words. They also need to write on a separate piece of paper any proper names ore difficult words they want to remember.

3) Give them a short time to compare and discusse their words with a partner.

4) Ask students to write their names on their texts, then take them in.

5) Students write a summary of the text using exactly fifty words.

6) Give back the original texts.

Prepared Text:

Electric Motor – A Brief Introduction

Almost every mechanical movement around us is caused by an electric motor. (1)

An electric motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor‘s magnetic field and electric current in a wire winding to generate force in the form of rotation of a shaft. Electric motors can be powered by direct current (DC) sources, such as from batteries or by alternating current (AC) sources, such as the public power grid or electrical generators. (2)

Parts of an Electric Motor
An electric motor creates rotational or circular motion. The central part of the motor is a cylinder called the armature or rotor. The armature holds the rest of the components and is also the part of the motor that spins. Around the armature is the stator, which holds insulated coils of wire, usually copper. When a current is applied to the motor, the stator generates the magnetic field that drives the armature. Depending on the design of the motor, there could be brushes or fine metal fibers that keep current running to the opposite side of the motor as it spins. (5)

Different Types of Electric Motors

The basic motor runs on direct current (DC), but other motors can run on alternating current (AC). Batteries produce direct current, while the plug in a normal home supply alternating.

In order for a motor to run on AC, it requires two winding magnets that don't touch. They move the motor through a phenomenon known as induction. These induction motors are brushless, since they don't require the physical contact that the brush provides.

Some DC motors are also brushless and instead use a switch that changes the polarity of the magnetic field to keep the motor running. Universal motors are induction motors that can use either source of power. (6)

Sources:
(1) https://electronics.howstuffworks.com/motor.htm
(2) https://en.wikipedia.org/wiki/Electric_motor
(3)(4) https://www.explainthatstuff.com/electricmotors.html
(5)(6) https://sciencing.com/electric-motor-work-4569196.html

5 Conclusions

- The students should change their fifty words with a partner and read through it.
- Force them to discuss the content.

Subject: Electrical Engeneering
Title of the Lesson Plan: Electric Motor – A Brief Introduction

Course / Level: 11th grade (3rd Class HTL)
L2 level for students/teacher: B2

1. Learning outcomes	Knowledge: to know about the main principles of an Electric Motor Skills: to be able to read and write, make notes and talk about the given text, train to research information and put them in their own words
2. Subject Content	Electric Motor
3. Language Content / Communication	
Vocabulary /Structures	Technical subject-specific language General English BICS
Discourse type	description, argumentative
Language skills	B2
4. Contextual (cultural) element	Added value of studying Electric Motor, the main principles through the medium of English – Contend and Language skills get improved
5. Cognitive (thinking) processes	remembering, identifying, defining things
6. Activities	1) “Key Word” speaking; remembering 2) “Experiment” watching; listening; talking 3) “Exactly fifty words” reading; writing summaries; taking in important information
7. Methodology	
Organization and class distribution / timing	1) Whole class / 10 min 2) Whole class / experiment 20 min 3) Individual work / 55min 4) Work in pairs / 15 min
Resources / Materials	Material for experiment, Text, Paper for making Notes
8. Evaluation Criteria	Learners should be able to know about the main principles of an Electric Motor in L2 language.
9. Evaluation Instruments	Talking about their outcome of the “Fifty words” task