Erasmus + KA1 project "Implementing CLIL in project work"
"Oxidation "

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Age group/form	8th form, 16 students, Level of English Pre-intermediate and Intermediate	
Time (min)	80 min	
Integration of subjects	English and Chemistry	
Timetable fit	The main theme **in English** is 'Our environment'. The main theme the learners are working on **in Chemistry** is 'Oxygen and Oxidation Processes'. They have briefly discussed oxidation processes in Latvian and now will revise and enrich the knowledge of terminology in English and Latvian.	
Aim	To deepen the knowledge about oxidation processes in nature and develop speaking skills.	
Objectives	1) to enrich the students vocabulary concerning oxidation processes; 2) to revise and apply Zero Conditional structures; 3) to practice speaking in groups and individually (argumentation, agreement and disagreement, describing processes) .	
Real life and culture context	Students will get acquainted with many other spheres of our life apart from Chemistry where Oxygen is used widely and metaphorically.	
Planned results	**Content**	Learners understand the main oxidation processes and can identify and describe them
	Language	Learners have enriched vocabulary and terminology on oxidation; they can identify Zero Conditional and know how and when to apply it.
	Communication	Learners have improved argumentation and summarising strategies
	Cognition	Learners can compare things and linguistic issues, and recognise differences and similarities

In what way CLIL is implemented in project work?

Students go through various activities in order to be able to produce a video clip or presentation about Oxygen and Oxidation Processes in nature.

Procedure

Pre-task (warm-up)

Activity1- Ranking the quotes. Students work in groups of 2 our 4 evaluating the quotes for Oxygen discussing and arranging them from the most to least correct or valuable. (Peer-assessment and teacher's comments)
Support materials 1: *http://www.brainyquote.com/quotes/keywords/oxygen.html*

Tasks (main part)

Activity2- Students are discussing the given statements and developing argumentation skills. They use video 'Why do we need Oxygen to Survive?' to practice listening, check their answers and learn some useful language (self - assessment).
Scaffolding – Useful language 1 – Sentence structure; Video with transcript https://www.youtube.com/watch?v=LM_CgtFORzw

Activity 3- Students are working in pairs and matching English and Latvian terms using the picture "Oksidācijas procesi" in Latvian and the slips of paper with English terms.
Scaffolding: Glossary, text 'Oxygen' and the Picture with key (self- assessment)

Activity 4- Matching – focus on Zero Conditional. Students work in pairs to make correct statements and discuss them (peer-assessment).

Activity 5. Planning and rehearsing a video clip. Students work in groups of 4 or 6, using all the materials from previous activities of the lesson to develop and rehears their video clip about Oxygen and /or Oxidation Processes in Nature (peer-assessment).
Scaffolding: Support materials 2: Text 'Oxygen' adapted from
http://www.ducksters.com/science/chemistry/oxygen.php
http://www.livescience.com/28738-oxygen.html

Post task (revision and reflection)

Activity 6- Peer- assessment: Students ask questions and evaluate each other video clip rehearsals. Teacher guides the discussion and gives her feedback for the lesson.
Possible Self-assessment: students write a vocabulary dictation on terminology.

Resources

1) Elements for Kids: Oxygen. Available from: http://www.ducksters.com/science/chemistry/oxygen.php
2) Glossary: Hornby, A. (2000) Oxford Advanced Learner's Dictionary. Oxford: Oxford University Press; www.letonika.lv
3) Oxygen Quotes. Available from: http://www.brainyquote.com/quotes/keywords/oxygen.html
4) Video Why do we need Oxygen to Survive ? Available from: https://www.youtube.com/watch?v=LM_CgtFORzw

Activity 1 a) Ranking the quotes. Students work in groups of 4 discussing and evaluating the quotes about Oxygen and arranging them from the most to least valuable to their mind. The number of quotes can vary from 3 to 5. Students explain the choice, write down and learn the selected quote. Aspects for discussion: 1) moral or idea of the quote; 2) colourful language and stylistic devices; 3) possible implications for us and our life. Sample quotes:

- *Freedom is the oxygen of the soul.* Moshe Dayan
- *Information is the oxygen of the modern age. It seeps through the walls topped by barbed wire, it wafts across the electrified borders.* Ronald Reagan
- *Humor is the oxygen of children's literature. There's a lot of competition for children's time, but even kids who hate to read want to read a funny book.* Sid Fleischman
  Source: http://www.brainyquote.com/quotes/keywords/oxygen.html

b) Students make a mind map for Oxygen, using quotes from the Internet and writing our all the possible metaphors connected with Oxygen

love **humour**

information

freedom

Activity 2 Work in pairs or groups of four and take turns to discuss the statements below. Use the given sentence structure in the box to develop your arguments. Mark each statement as (T or F) /True or False.

1. Without oxygen our brain dies within 10-15 minutes.
2. Oxygen is the most abundant (widespread) element on our planet.
3. Oxygen makes about 90 percent in the atmosphere.
4. Oxygen makes about 30% of all the Earth's water.
5. Oxygen makes about 17 percent of the Earth's crust. (ENG-crust /LV-garoza / RU-кора)
6. Plants don't need oxygen at all; they produce it.

Scaffolding – Useful language 1

Your opinion	**Information from the statements**	**Connection**	**reason/explanation**
• *I completely agree that* • *I partly agree that* • *I completely disagree that* • *I believe that* • *I think that*	1. without oxygen our brain dies within 10-15 minutes 2. Oxygen is the most widespread	• **because** • **as** • **but** • **however** • **and**	• it sounds right. • it hasn't been proved yet • it cannot be true. • it is quite possible. • I have read about it.

- Watch the video clip “Why do we need oxygen?” and check your guesses.
- Choose 3 statements and comment on them in a written form according to the example below
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0) [Example]: *I completely agree that* without oxygen our brain dies within 10-15 minutes **because** I have read about it.

1) _____

Activity 3 Students work in pairs and match English and Latvian terms using the picture “Oksidācijas procesi” in Latvian and the slips of paper with English terms below:

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RUSTING OF IRON COINS	**TARNISHING OF SILVER BRACELETS**
DECAY OF APPLES	**DECOMPOSITION OF DINOSAUR BONES**
BURNING	**EXPLOSION**
BREATHING	**PHOTOSYNTHESIS**

Support materials 1 & 2 (Glossary and the picture key).

When matching Latvian and English terms for Oxidation Processes describe each process with at least 3 sentences using the Useful language section below:

Scaffolding - Useful language2:

- We can see a …..in the picture
- I think the name of the process is decay/rusting/..... because …
- The process is called…
- It **consumes / uses /creates/produces** oxygen (O2) / carbon dioxide (CO2).
- We can observe the process when….
- It **produces** oxygen (O2) or carbon dioxide (CO2).
- It **breathes in** carbon dioxide (CO2) or oxygen O2
- It **breathes out** …
- The arrow shows/indicates……
- The **arrow points to** or from the object/ tree, because …
- It shows **usage of/ production of/influence of/ breathing in/ breathing out** O2 (CO2)

Support materials 1: Glossary

Oxygen /ˈɒk.sɪ.dʒən/- a chemical element that is a gas with no smell or colour. *Oxygen forms a large part of the air on Earth, and is needed by animals and plants to live.* **LV-skābeklis; RU- кислород**
Oxidation /ˌɒk.sɪ.daɪˈzeɪ.ʃən/- If a substance oxidizes, it combines with oxygen and loses hydrogen to form another substance, and if something oxidizes a substance, it causes it to do this: *Iron oxidizes to form rust. When you heat fat, it oxidizes easily.* **LV– oksidēšana; RU- окисление**
Slow oxidation - lēna oksidēšanās; медленное окисление
Fast oxidation - strauja oksidēšanās; быстрое окисление
Substance /ˈsʌb.stəns/ material with particular physical characteristics: an organic/chemical substance. *What sort of substance could withstand those temperatures?* **LV– viela; RU- вещество**
Decay /dɪˈkeɪ/ (v, n)- When something such as a dead body, a dead plant, or a tooth decays, it is gradually destroyed by a natural process. *The ground was covered with decaying leaves.* **LV-trūdēšana; RU-гниение**
Breathing /ˈbriː.ðɪŋ/ or **respiration** /ˌres.pɪˈreɪ.ʃən/ the act or process of taking air into your lungs and releasing it:*I could hear the sound of heavy breathing as he slowly climbed the stairs.* **LV– elpošana; RU- дыхание**
Tarnish /ˈtɑː.nɪʃ/ If a metal **tarnishes** or if something **tarnishes** it, it becomes stained and loses its brightness. *Wear cotton gloves when cleaning silver, because the acid in your skin can tarnish the metal.* **LV– apsūbēšana; RU- потускнение**
Rust /rʌst/ (v) When a metal object rusts, it becomes covered in rust and often loses its strength. *Copper nails are better than iron nails because the iron rusts.* **LV– rūsēšana; RU- ржавление**
Explosion /ɪkˈspləʊ.ʒən/ the fact of something such as a bomb exploding: *The fire was thought to have been caused by a gas explosion.* **LV– sprādziens; RU- взрыв**
Burning /ˈbɜː.nɪŋ/ producing flames: *A man staggered from the burning car.* **Combustion** /kəmˈbʌs.tʃən/ the chemical process in which substances mix with oxygen in the air to produce heat and light) **LV – degšana; RU- горение**
Decomposition /ˌdiː.kɒm.pəˈzɪʃ.ən/ is the process of decay that takes place when a living thing changes chemically after dying. *The corpse was in the last stage of decomposition.* **LV- sadalīšanās; RU-разложение**

Support materials 2: Text adapted from
http://www.ducksters.com/science/chemistry/oxygen.php
http://www.livescience.com/28738-oxygen.html

Oxygen

Oxygen is an important element that is needed by most life forms on Earth to survive. It is the third most abundant element in the universe and the most abundant element in the human body. Oxygen has 8 electrons and 8 protons. It is located at the top of column 16 in the periodic table.

Characteristics and Properties

Under standard conditions oxygen forms a gas that is composed of molecules consisting of two oxygen atoms (O_2). Oxygen (O) has an atomic number of eight. Oxygen can be gaseous, solid and liquid. In its gaseous form oxygen is odourless, tasteless and colourless, but pale blue in its liquid and solid states. Oxygen is a very reactive element in its pure state and can make compounds from many other elements. Oxygen readily dissolves in water.

The Oxygen Cycle

The oxygen cycle plays an important role in life on Earth. Oxygen is constantly being used and created by different processes on planet Earth. All of these processes together make up the oxygen cycle. The oxygen cycle is interconnected with the carbon cycle.

In the simple example of the oxygen cycle, you can see how **oxygen is used by** animals. **Plants** are the main creators of oxygen in the atmosphere through the process of **photosynthesis**. Here the tree uses sunlight and CO2 or carbon dioxide to produce energy and releases oxygen. The giraffe **breathes in** the oxygen and then **breathes out** carbon dioxide. The plant can then use this carbon dioxide and the cycle is complete.

Processes That Use Oxygen or Oxidation processes:

- Breathing - The scientific name for breathing is respiration. All animals and plants use up oxygen when they breathe. They breathe in oxygen and breathe out carbon dioxide.
- Decomposition and Decay - When plants and animals die they and decay and decompose. This **process uses up o**xygen and **releases** carbon dioxide.
- Tarnishing - when metal tarnishes its outer layer is combining with O2 and other elements and losing its shine and colour. Like silver, for example, tarnishes, while iron rusts.
- Rusting - This is also called oxidation. When things rust they use up oxygen.
- Combustion or burning- There are three things needed for burning: oxygen, fuel, and heat. Without oxygen you can't have a fire. When things burn, they **use up oxygen** and **replace it with carbon dioxide.**
- Explosion is a rapid and violent oxidation reaction that produces large amounts of hot gas.

Processes That Produce Oxygen

- Plants - Trees **create** the major part of **the oxygen** we breathe through a process called photosynthesis. In this process plants use carbon dioxide, sunlight, and water to create energy and **produce oxygen** which they release into the air.
- Sunlight - Some **oxygen is produced** when sunlight reacts with water vapour in the atmosphere.

How is oxygen used today? Oxygen **is used by animals** and plants in the respiration (breathing) process. Tanks of oxygen are used in medicine to treat people with breathing problems. They are also used as life support for astronauts and scuba divers. The majority of the oxygen used in industry is used in the manufacturing of steel. Other applications include making new compounds such as plastics and creating a very hot flame for welding. Liquid oxygen is combined with liquid hydrogen to make rocket fuel.

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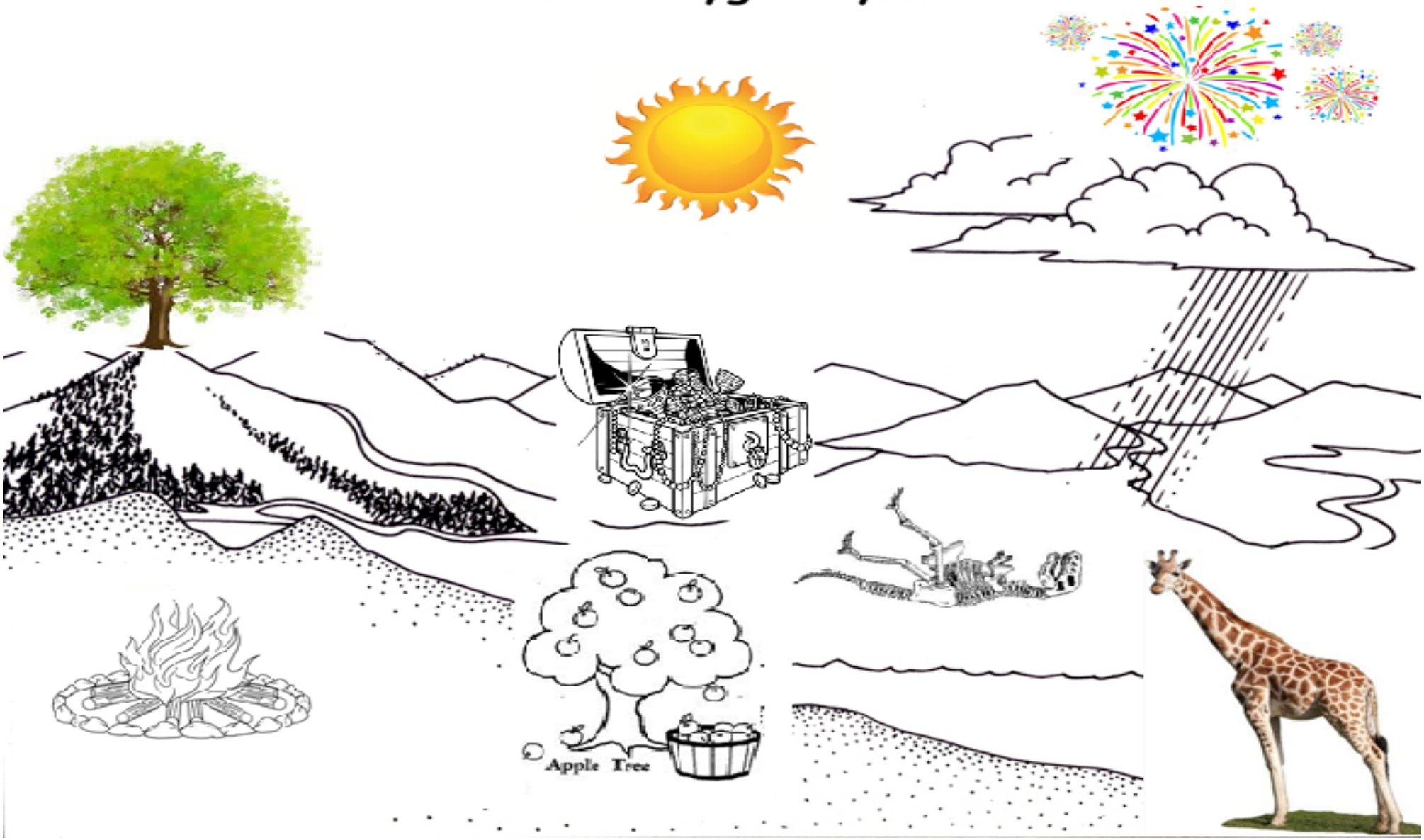
The Oxygen Cycle



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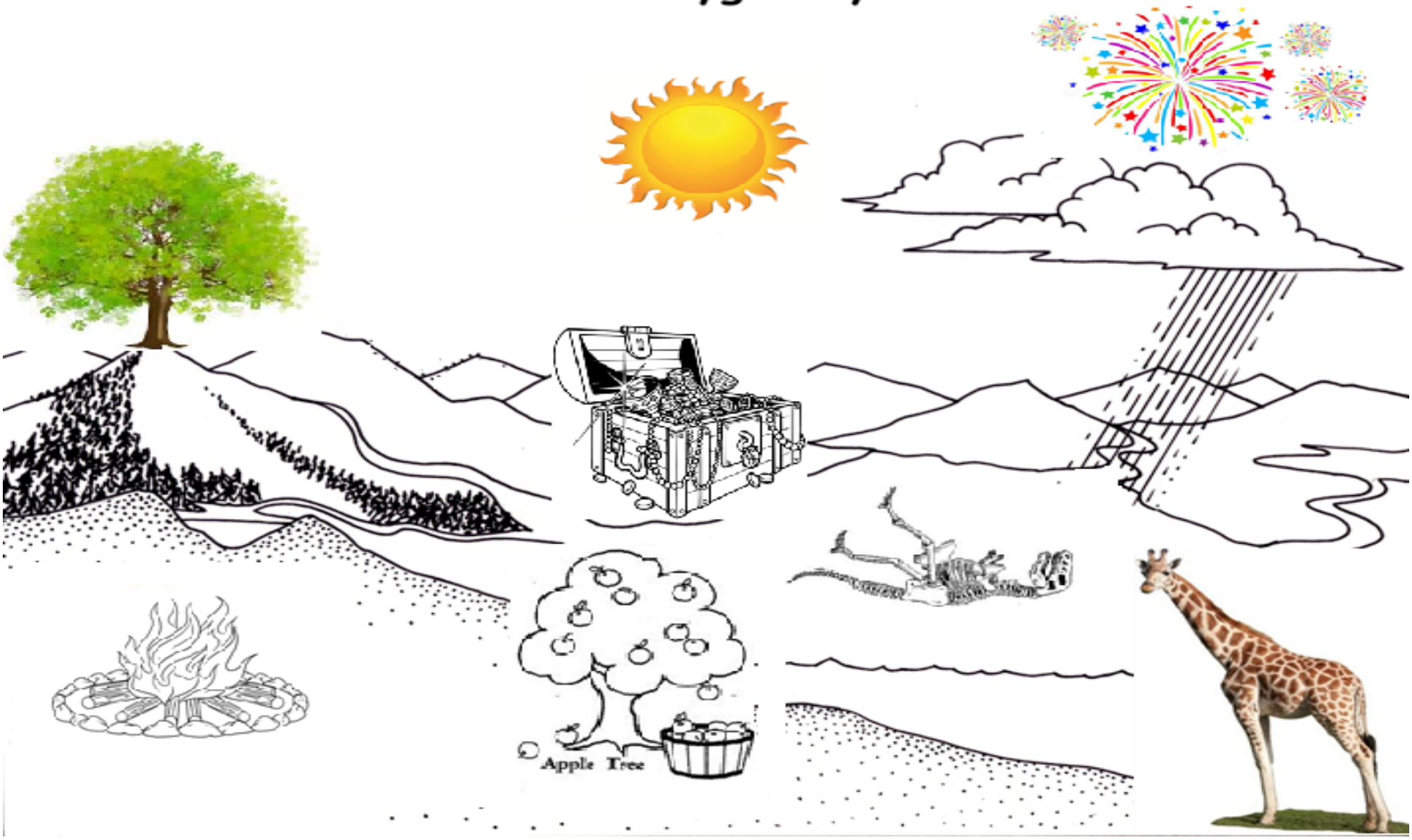
The Oxygen Cycle



Activity 4. Focus on Zero Conditional. There are 2 variants for the task:

1) All students have to stand up and go out of the classroom. Each student gets one slip of paper and has to find a partner with a suitable slip of paper to make a correct statement. All statements are displayed on a big A3 size poster for further discussion (students need to use a glue stick).

2) Students work in pairs to match the slips of paper on the desk. Alternatively, students can first do the task as variant No1 using a big A3 poster and then do it in pairs or groups for revision.

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IF WE BREATHE,	**WE USE OXYGEN (O2).**
IF WE EXHALE,	**WE BREATHE OUT CARBON DIOXIDE (CO2).**
WHEN PLANTS AND ANIMALS DIE,	**THEY DECAY AND DECOMPOSE.**
WHEN METAL TARNISHES,	**IT LOSES ITS SHINE AND COLOUR.**
WHEN IRON THINGS RUST,	**THEY USE UP OXYGEN.**
IF THERE IS NO OXYGEN,	**THERE CAN BE NO FIRE.**
IF THINGS BURN,	**THEY USE UP OXYGEN AND REPLACE IT WITH CARBON DIOXIDE.**
IF SOMETHING EXPLODES,	**A LARGE AMOUNT OF HOT GAS IS PRODUCED.**
WHEN PLANTS CREATE OXYGEN,	**THIS PROCESS IS CALLED PHOTOSYNTHESIS.**

Activity 5. Planning and rehearsing a video clip or presentation. Students work in groups of 4 or 6, using all the materials from previous activities of the lesson to develop and rehears their video clip about Oxygen and /or Oxidation Processes in Nature (peer-assessment).