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| **MODULE 4** | **THE IMPACTS OF THE ENVIRONMENTAL PROBLEMS AND CLIMATE CHANGE** |
| **PART 3** | **TERRESTRIAL ECOSYSTEMS** |
| **Lesson 2** | Students consider the changes in the land use, reach data and analyze the data to draw conclusions. Students develop an action project for the sustainability of terrestrial ecosystems. |

**SUMMARY**

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# 1. COURSE TIME, TARGET AND TOPIC

* **Age of target students:** 15+
* **Teaching time:** 1 hour
* **Disciplines:** English, art, ICT, biology, social studies, geography, physical education
* **Title:** Exploring terrestrial ecosystems. Developing a sustainability action project.

# 2. COURSE OBJECTIVES

## Competences promoted in this lesson:

* Communication in foreign languages competency
* Digital competency
* Learning to learn competency
* Social and citizenship-related competencies
* Initiative and entrepreneurship competencies
* cultural awareness and expression competences

## Lesson objectives:

* The students consider the changes in the land use, reach data and analyze the data to draw conclusions
* The students develop an action project for the sustainability of terrestrial ecosystems

# 3. LEARNING – TEACHING PROCESSES

There are 4 activities in this lesson:

1. **ENGAGE:** Group discussions to revise the information from the previous lesson
2. **EXPLORE:** Land Use Time Travel – playing a game during which the students are to become time travellers on a mission to investigate changes in land use in Europe and in the world over the centuries. They will travel through different historical periods (1800s, 1900s, 2000s, and the future), analyze land use data, and report their findings
3. **EXPLAIN:** Groups present their "time travel reports" to the class
4. **EXTEND:** Students design a sustainability action project

# 4. EVALUATION

The evaluation is described in the last part of document.

# 5. DOCUMENTS

### ENGAGE

### *Warm-up – group discussion*

Introduce the topic of the lesson to the students, inform them that at this stage they are going to revise the information from the previous lesson. Divide the students into small groups of 4-5 and ask them to discuss and list the types of terrestrial ecosystems they know and their importance.

Do not spend longer than 5 minutes on this stage of the lesson. Walk between the groups and monitor the students’ exchange of information.

### EXPLORE

### *Land Use Time Travel*

1. Inform the students that they are going to play a game called : Land Use Time Travel. The students are to become time travellers on a mission to investigate changes in land use in Europe and in the world over the centuries. They will travel through different historical periods (1800s, 1900s, 2000s, and the future), analyze land use data, and report their findings.
2. Let the students work with the teams they have just worked with. Assign each group a "time period": 1800s, 1900s, 2000s, and future 2100. There might be more groups depending on the size of the class. Costume Fun: Provide each group with a large sheet of paper and simple props like hats, glasses, or costume pieces to represent their assigned time period. Encourage them to get into character and have fun with it.

1800s: Top hats, monocles, and vintage-looking glasses.

1900s: Bowler hats, moustaches, and old-fashioned spectacles.

2000s: Modern hats, sunglasses, and trendy accessories.

2100s: Futuristic glasses, shiny hats, and imaginative costumes (e.g., possibly made from recyclable materials).

1. Data Distribution: Hand out printed data sheets and graphs for each time period, showing land use changes in Europe and in the world. See the attachment. Encourage the students to look for data on the internet if they find it necessary.
2. Data Analysis: Each group analyzes their time period's data sheet, looking for trends and significant changes in land use.
3. Creative Report: On large sheets of paper or poster boards, groups create a "time travel report" that includes: a brief description of their time period, key findings from their data analysis (e.g., major changes in forest area, agricultural land, urbanization), drawings or cartoons depicting land use in their assigned period, highlighting the changes.
4. Encourage creativity and humor, for example, the students may prepare themselves to speak in an exaggerated manner fitting their time period or include funny anecdotes about land use changes.

### EXPLAIN

### *Time Travel Presentations*

Presentation Prep: Each group gets 2 minutes to prepare their presentation.

Presentations: Groups present their "time travel reports" to the class.

Possible answers :

Time Period: 1800s

Key Findings: High forest coverage, extensive agricultural land, rapid development of urban areas.

Creative Element: Drawing of a countryside with large forests, farms, and tiny villages or factories, overpopulated cities, dirt in the streets, smog in the air

Time Period: 1900s

Key Findings: Slight decrease in forests, increase in agricultural land and urban areas.

Creative Element: Cartoon showing early industrial cities with smoke stacks and sprawling farms.

Time Period: 2000s

Key Findings: Significant urbanization, decrease in forests and agricultural land.

Creative Element: Modern cityscape with high-rise buildings, fewer green spaces, and crowded streets.

Time Period: 2100s (Projected)

Key Findings: Further urban expansion, substantial decrease in forests and agricultural land or just the opposite: thanks to undertaken steps increase in forest area and grassland

Creative Element: Futuristic city with green roofs, urban gardens, forest patches, etc.

### EXTEND

### *Developing a Sustainability Action Project*

Introduction: Students are asked to divide themselves into teams (might be small groups or pairs). Explain that each group will create a small project aimed at promoting the sustainability of terrestrial ecosystems.

Each group chooses an issue (e.g., reforestation, reducing urban sprawl, sustainable agriculture, etc.).

They brainstorm ideas for an action project (e.g., planting trees, creating awareness campaigns, community gardens), draft their project plan on poster boards, include goals, steps to achieve them, and how they will measure success.

They explain the ideas to the whole class. Encourage the students to work on these projects and implement them in their groups or even their communities and when they are completed assess their results and reward the students with the highest marks for their hard work.

### EVALUATE

Class Discussion: ask the students the following questions:

What trends do you notice in the forest area from 1990 to 2020?

How has the area of agricultural land changed over time?

What could be the potential impacts of the decrease in forest area on biodiversity?

How might the increase in urban areas affect local ecosystems?

What measures can be taken to mitigate the negative impacts of land use changes on terrestrial ecosystems?

Suggest some sustainable practices that could help balance the needs for agricultural land and forest reservation.