

## Lesson plan for year 1 Secondary " Life cycles of plants and their relationship with environmental conditions "

### 1. Big Idea

- 1.1. Why do we propose this activity? Because it allows us to establish a relationship between Migration of birds with the climatic characteristics and annual seasons. The lesson work plan will be based on the "inquire based learning"
- 1.2. Learning-based methodology: student-centered learning and collaborative work, BSCS 5E Instructional Model

### 1.3. Objectives and Results

- Students become familiar to observing the plants and their environment
- Students should be able to: observe plant life cycles either through fast growing plants or through a video (<https://www.youtube.com/watch?v=Ws89Q9afmEU>)
- Recognize the characteristics of the cycles of a plant.
- Identify the parts of the plant and their functions.
- Find the plants in the area, select several plants and compare them with those in other areas. (Countries participating in the project)
- Use ICT for learning and familiarize the student with the use of different resources (iPad, mobile, project app, ...). The App will contribute students do observations in a scientific way.
- Students will be able to use scientific vocabulary to explore, explain and elaborate the observation in the APP.
- Learn to make observations, explore different phenomena, explain them, elaborate conclusions, all these using scientific vocabulary.
- Students will be able to identify spatial data in geomaps in order to compare different situations (growing, floración,...) and the influence of the environment in plants life cycle.
- Develop transversal competences such as critical thinking, decision making, autonomous learning, teamwork ...
- Show interest and rigor about the respect and care of plants and respect for the environment, getting to know all of the nearest environment and what happens with the same plants in other countries with different weather.
- Know how to synthesize the knowledge acquired, presenting the results using different supports.
- Encourage discussion and exchange of ideas among students.

1.4. Decisions on how to integrate the lesson into the curriculum. It is a lesson of the curriculum of year 1 Secondary in Galicia

1.5. Decisions about the ICT that we are going to use (besides the app and the server). students will use conceptual maps, we think it is a simple and very useful

tool so that the students can elaborate the contents of the subject and it facilitates that all the students have all the necessary information at hand.

1.6 Teacher's sheet

1.7 Rubric ( it is enclosed)

2. To work through this lesson we will use the BSCS 5E Instructional Model which includes motivation, exploration, explanation, elaboration and evaluation

**Motivation:** We can start from a plant observing the vital cycles of a plant in the classroom itself or through a video. (<https://www.youtube.com/watch?v=Ws89Q9afmEU>). We must teach students to make observations since the scientific point of view, using appropriate vocabulary...

**Exploration:** Students analyze different life cycles of plants (daisy, blackberry and / or dandelion) and the influence of the environment and annual seasons in their development. They'll study the vital process that occur in each season of the year and its influence in an specific plant lifecycle.

**Explanation:** Students are able to put in order all the information and is able to explain it to their colleagues with the support of photos (from their own observations and scientific descriptions from the App and Geomap in order to have enough evidences to document all the scientific information about the plant life-cycle.

From here we ask students in groups of 4 to describe the itinerary of a plant throughout the lifecycle, present it to their colleagues with the ICT means they deem most appropriate.

**Elaboration:** each group of 4 students elaborates all about a plant lifecycle (eg. daisy) and after that analyzes what happens with these same species in other countries that participate in the project. If necessary, a webinar can be carried out with one or more educational schools from another country and discuss with their students, reflecting on how the environmental conditions influence the development of the plant life cycle.

**Assessment:** As a formative evaluation, the students make a conceptual map about the cycles of plants and the influence of the different seasons of the year and the climate in their development

The teacher will have an observation sheet on students works

The groups present their work using the digital whiteboard and another group evaluates them taking into account the evaluation criteria negotiated by teachers and students.

Students rate the final product according to the criteria and a team member justifies the reason for the evaluation

The students will make the attached rubric and the teacher with all these data and the observation sheet will elaborate the summative evaluation.

### 3. Reflection on experimentation

3.1. We analyze the consistency of the proposed activities and tools in relation to the objectives, competences and transversal skills that we intend to develop.

3.2. The teacher will justify the added value of the ICT tools used.

## Rubric

<b>"Vital cycles of the plants and their relation with the environmental conditions"</b>				
	Development 1	Improvement 2	Advanced 3	Mark
<b>Critical thinking</b>	<p>I am not able to analyze situations and argue reasoned and make own decisions</p> <p>I do not recognize the weaknesses of a line of reasoning</p>	<p>I am able to argue reasoned, but it is difficult for me to make my own decisions</p> <p>I can follow a line of reasoning</p>	<p>I reason my decisions</p> <p>I recognize the weak points of a line of reasoning. I reflect on products the right information</p>	
<b>Authonomous learning</b>	<p>I am not responsible for my work, I do not meet the deadlines, nor do the proposed tasks</p>	<p>I perform tasks with acceptable quality, I just do what I am asked to do.</p> <p>I have the work when I'm asked to</p>	<p>I perform the requested activities in a creative way, I contribute all the data that I consider relevant. I have the works ready before the deathline</p>	
<b>Learning to learn</b>	<p>I don't feel positive about learning I don't like solving problems I can't use strategies to make my learning easier</p>	<p>I don't feel positive about learning I don't like solving problems When I find a difficult task I don' try to go on I 'm able to use strategies to make my learning easier</p>	<p>I feel positive about learning I don't stop when I face difficulties I know about and can use strategies to make my learning easier</p>	
<b>Search, collect and select information</b>	<p>The information found is not relevant (the photos are not the best) is not well organized. There are some errors in the information.</p>	<p>The information seems to be OK, but does not include the relevant elements, all the photos belong to what we have requested. I'm</p>	<p>Very good search, relevant data. The photographs are the most important and show evidences on how the weather and the seasons affect the development of</p>	

	The photos do not provide evidence, description is poor because I don't use the appropriate scientific vocabulary and some data are missing	able to use scientific vocabulario The description is fine, but there are mixed elements.	plants life cycle. I'm able catch ideas using scientific vocabulary. Very good description and relevant data	
<b>Team work</b>	Poor cooperation in group. Most of the work was done by only one team member	Good cooperation in group. Participation in the search has been unequal, as the contributions to the presentation	All group members have contributed to the project work Contents are appropriate and students use scientific vocabulary in the best way .	
<b>Learned contents</b>	Lack of clarity in the contents learned and poor vocabulary	The learned contents are accurate, but with little degree of depth Insufficient clarity of ideas, insufficient use of scientific vocabulary	The learned contents are solid, clear and precise. Accuracy in terminology and ideas.	
<b>Final task</b>	Scarce adjustment requested. Lack of clarity and little processing,	There is some evidence of creativity. Task performed correctly and the scientific vocabulary is appropriate but it need to be improved..	I can generate appropriate ideas, integrating into them prior knowledge Technically very successful implementation of the final task	
<b>Pooling and final debate</b>	There has been no information exchange and sharing between groups Pooling and debate have been significantly inadequate	Sharing and discussion have been somewhat insufficient. The working environment in the groups has been adequate	There has been sufficient exchange of information between groups and lively debate and they are able to express ideas in scientific way.	

# Teachers ' sheet

## "Vital cycles of the plants and their relation with the environmental conditions"

ACT	Activities What we are going to do	Objetives Main aims	Transversal skills	Students activities	Teacher's Activities	Tools With what?	Results What do we create?
1	<p><b>Motivation:</b> We can start observing the vital cycles of a plant in the classroom itself or through a video. (<a href="https://www.youtube.com/watch?v=Ws89Q9afmEU">https://www.youtube.com/watch?v=Ws89Q9afmEU</a>). Students will get familiar in doing scientific observations and using appropriate vocabulary.</p> <p>Exploration: Students analyze the different life cycles of plants and the influence of the environment in their development. Study of the vital processes that</p>	<ul style="list-style-type: none"> <li>-Students learn to perform real tasks</li> <li>- Interest in the rigorous study of the life cycles of a plant</li> <li>- learn to make scientific observations and use the suitable vocabulary about Life cycle of plants</li> <li>- to know the characteristics of the life cycles of plants and the</li> </ul>	<ul style="list-style-type: none"> <li>-Work autonomously</li> <li>-Creativity</li> <li>-Selection of information</li> <li>-Decision making</li> <li>-Communication of the information using different suitable vocabulary and ICT supports</li> </ul>	<ul style="list-style-type: none"> <li>- Learn to make scientific observations</li> <li>-Select information and be able to explain it using scientific vocabulary</li> <li>-Create contents about the life cycles of plants</li> <li>-Teamwork</li> <li>Interrelate information</li> </ul>	<ul style="list-style-type: none"> <li>- Provide information</li> <li>-Guide the student within his autonomy</li> <li>-Give students feedback on the work done</li> <li>- Teacher will try to improve in students the ability to do scientific observations , getting inside of scientific vocabulary use.</li> </ul>	<ul style="list-style-type: none"> <li>- Project Apps</li> <li>- Project</li> <li>-mobiles</li> <li>-iPads</li> <li>-Xmind</li> </ul>	<p>A collection of photographs about the life cycle of a plant</p>

	<p>occur in each season of the year. Each group of 4 students choose a vegetable species (daisy, blackberry and / or dandelion)</p>	<p>influence of climate, year seasons and the environment on them</p> <ul style="list-style-type: none"> <li>- Present the results using evidence</li> <li>- Show interest and rigor about the work done</li> <li>- Know how to use the tools of the project (APP and map to support theories and evidences</li> </ul>					
2	<p><b>Exploration:</b> Students analyze different life cycles of plants (daisy, blackberry and / or dandelion) and the influence of the environment and anual seasons in their development. They'll</p>	<p>Use photographs to support evidences in scientific exploration</p> <p>Use suitable vocabulary to</p>	<p>Explore different phenomena and be able to apply scientific point of vew.</p> <p>Communicating information using</p>	<p>Collect photos that support the evidence in explaining the content of the life cycles</p>	<p>Guide the student in the development of activities.</p> <p>Learning to use error as a learning resource</p>	<p>Móvil iPad notebook</p>	<p>Be able to explain the life cycles of plants with visual support.</p>

	<p>study the vital process that occur in each season of the year and its influence in an specific plant lifecycle.</p> <p><b>Explanation:</b> Students are able to put in order all the information and is able to explain it to their colleagues with teh support of fotos (from their own observations and scientific descriptions from the App and Geomap in order to have enough evidences to document all the scientific information about the plant life-cycle.</p> <p>From here we ask students in groups of 4 to describe the itineratio of a plant throughout the lifecicle, present it to their colleagues with</p>	<p>explore <b>phenomena</b> of life cycle</p> <p>Use of adecuate vocabulary and fotos to explain phenomena about plants lifecycle</p>	<p>suitable vocabulary in a creative and concise way with the necessary visual aids</p>	<p>of chousen plants</p>			
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	the ICT means they deem most appropriate.						
3	<p><b>Elaboration:</b> each group of 4 students elaborates all about a plant lifecycle (eg. daisy) and after that analyzes what happens with these same species in other countries that participate in the project. If necessary, a webinar can be carried out with one or more educational schools from another country and discuss with their students, reflecting on how the environmental conditions influence the development of the plant life cycle.</p>	<p>Be able to communicate information about the life cycles of plants with the support of images, Apps and GEOMAP, using suitable vocabulary.</p>	<p>Know how to combine written and graphic information for efficient communication.</p> <p>Be able to observe and express phenomena of plants lifecycle</p> <p>Use the error to implement the learning process</p>	<p>Select information and communicate knowledge using appropriate vocabulary and multimedia resources</p>	<p>Support the student, promoting autonomous learning.</p> <p>Support students in making observations, describing phenomena and compare these facts with what happens in other countries</p>	<p>Xmind map</p> <p>Internet</p> <p>project APP</p>	<p>Communicate different phenomena that happen in the plantslifecycle</p> <p>Compare the influence of different climates / areas of the earth and their influence on plant life cycles</p>

	<p><b>Assessment:</b> As a formative evaluation, the students make a conceptual map about the cycles of plants and the influence of the different seasons of the year and the climate in their development</p> <p>The teacher will have an observation sheet on students works</p> <p>The groups present their work using the digital whiteboard and another group evaluates them taking into account the evaluation criteria negotiated by teachers and students. Students rate the final product according to the criteria and a team member justifies the reason</p>	<p>Students and teachers reflect on the own learning process</p> <p>Teachers use an observation sheet for students assessment</p> <p>Evaluation in pairs</p> <p>Use of formative assessment to students learn</p>	<p>-Autonomous learning</p> <p>- responsible for their learning process</p>	<p>-Self assessment</p> <p>pair assessment</p> <p>Formative assessment</p>	<p>Use the observation sheet</p> <p>agre with students assessment criteria</p>	<p>Xmind map /google questionnaire</p>	<p>Evaluate students using</p> <p>Observation sheet</p> <p>Pair assessment</p> <p>Self assessment and ICT tools</p>
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