# Europeana Learning Scenario

**Title:** Wind is all around us: let´s make electricity

**Author(s):** Carlos Cunha

**Summary:** Develop a pedagogical activity using digital heritage to see the evolution of win power technology a try to anticipate the near future.

## *Table of summary*

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|---|---|
| **Subject** | *Physics and mathematics* |
| **Topic** | *Energy and sustainability.* |
| **Age of students** | *14-16* |
| **Preparation time** | *45 min* |
| **Teaching time** | *180 min* |
| **Online teaching material** | **Introduction to wind energy** https://youtu.be/Z5c50-_hcD0 How does wind works?<br>**Wind energy history** https://youtu.be/JIJ2-MkdcLg and https://youtu.be/0nPbxFxB0GY<br>**How to make a wind turbine** https://youtu.be/AckRAYQ8N48 Instructions how to build a low cost turbine to charge cell phones for free<br>**Padlet** https://padlet.com/ Online platform where students can share ideas about the work they will create.<br>**Tricider** https://www.tricider.com/ Could be use by teams to vote and comment on ideas proposed to do this activity<br>**Microsoft Forms** https://support.office.com/pt-br/article/criar-um-formul%C3%A1rio-com-o-microsoft-forms-4ffb64cc-7d5d-402f-b82e-b1d49418fd9d This will be used to students evaluate the work of their peers, and to give feedback to the teacher.<br>**Flipgrid** https://flipgrid.com/ This will be used by the students to give feedback to the teacher. |
| **Offline teaching material** | If students decide to build the wind turbine, materials are on the movie https://youtu.be/AckRAYQ8N48 |
| **Europeana resources used** | **Image 1**<br>https://www.europeana.eu/portal/pt/record/2020739/object_DCU_24257298.html?q=windmill<br>**Image 2**<br>https://www.europeana.eu/portal/pt/record/9200579/mfkferxd.html?q=windmill<br>**Image 3**<br>https://www.europeana.eu/portal/pt/record/2021649/AtlantisPubliek_detail_aspx_xmldescid_772530.html?q=windenergie |

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**Co-financed by the Connecting Europe Facility of the European Union**

## Integration into the curriculum

This content is integrated on the topic Energy and Electrical Phenomena, of the 10th grade in Physics. Sustainability is a transversal topic that has to be integrated on the content of all subjects of the curricula. In Mathematics we will use the subject of Statistics and on ICT the skills developed to produce the final product to present do the students peers.

## Aim of the lesson

Wind energy is free, abundant in some places and relatively easy to use. Its use has centuries of history, namely for water supply and for mobility. The use to produce electricity is much more recent and, in addition to involving expensive technology, it is not free from environmental problems. In this work we will establish an evolution of wind energy technology and discuss its advantages and disadvantages.

## Trends

**PBL: P**roject **B**ased **L**earning. Students learn by developing projects based one the contents defined on their curriculum topics working in groups based on a driving question.

**Mobile learning:** Get access to information and knowledge through smartphones and tablets (learn anytime, anywhere);

**Collaborative learning:** a strong focus on group work;

**Peer Learning**: students learn from peers and give each other feedback;

**BYOD:** Students bring their own mobile devices to the classroom.

**Flipped Classroom:** Flipping the classroom is a "pedagogy-first" approach to teaching. In this approach in-class time is "re-purposed" for inquiry, application, and assessment in order to better meet the needs of individual learners.

## 21st century skills

This Learning Scenario aims to facilitate educational contexts where students will develop a set of crucial competences that today are defined as a key factor for the professional and personal life of our students.

Besides the importance of developing a critical conscience about electricity productions with non-pollutant methods ad sustainability, the activities on the LS aims to drive students to develop also other competences such as:

**Collaboration**: by working as team students will need to interact, plan, make decisions as a group to develop the tasks of this LS.

**Creativity**: since they will have some "freedom" in creating the final product they will be driving to apply creativity on their creations

**Communication**: students will have to present the work developed to their peers. This will allow them to develop communication skills.

**Curiosity**: another important skill that our students must develop is curiosity. The LS must be presented in a way that students are eager to investigate the topics of the LS, involving them on the activities and guide them through the all process keep them always eager for them to learn more.

**Activities**

| Name of activity | Procedure | Time |
|---|---|---|
| **1) Presentation and general discussion** | Teacher will present to students what is the main idea of the activity. Present Europeana (explain how to search for information) portal. | 10 min<br><br>**Total Time:** 10min |
| **2) Teams creation and roles** | Create teams (4 elements each) with roles according to student's profile. Decide a team manager responsible for the communication of the team with the teacher. Each team add a main idea about the activity on the Tricider Class. Each team can decide specific roles such as: an investigator, a final product creator and so on... | 20 min<br><br>**Total Time:** 30min |
| **3) Teams draft developing (collaborative work)** | Each team as to develop a draft plan that will be their guide during for the LS. On a Padlet wall students will write a short sentence about the work they will do (if they prefer, they can record a short video also and publish it on the Padlet) | 20 min<br><br>**Total Time:** 50min |
| **4) Research and investigation (*collaborative work*)** | Students will have to do research about the topic, investigate sources provide on the LS and use others that they considered reliable. | 30 min<br><br>**Total Time:** 80min |
| **5) Data collection (*critical thinking*)** | According to their investigation and the draft designed previously students will select all the information needed to create the final product (video, oral presentation, scientific poster with QR connections). They must pay attention to copyright issues regarding the data they collect. | 30 min<br><br>**Total Time:** 110min |
| **6) Final product development (*ICT skills and creativity*)** | Using all the information collected students will the correct software to develop their final product. | 40 min<br><br>**Total Time:** 150min |
| **7) Final Presentation (*communication*)** | Each team will present the result of their work to all the class. During the presentation the peers will evaluate the other teams work using an online form. Results will be published after all the presentations and evaluations have been made. | 30 min<br><br>**Total Time:** 180min |

## Assessment

A Quiz can be used to evaluate students' inputs to the work. There will be topics that are mandatory to explore on the activity that could be include on the assessment task.

********** **AFTER IMPLEMENTATION** **********

## Student feedback

With Microsoft Forms the teacher will create a Diary Question asking students to provide a feedback about the work developed and what were their contributions for this activity. Important also to ask students how this activity was important concerning their learning and knowledge acquirement. Another possibility could be asking students to make a video feedback using a tool platform like FlipGrid (https://flipgrid.com/).

## Teacher's remarks

Based on students feedback the teacher should reflect on that, as a strategy to improve future activities. Also, is recommended that teachers could reflect by their own using strategies such as: writing a post on blog, if he/she has one, about student's experience. Another possibility is to write a post for the school Facebook page or institutional website. Is, also, important to give parents feedback about the students work. This could be done by online sharing with parents the final products created by the students.

## About the Europeana DSI-4 project

Europeana is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.

European Schoolnet (EUN) is the network of 34 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.