**SCIENTIX LESSON PLAN**

**Title**

**THE WEATHER IN OUR TOWN!**

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**Subject**

Physics, Chemistry, ICT, Geography, Arts

**Aim of the lesson**

Divided in small teams, the students will study and investigate the weather from their hometown. They will:

* Work collaboratively to collect, and analyze in real-time data or archived data, such as air pressure, temperature, precipitation, wind, humidity, etc.
* Investigate and understand how local geography, specifically land and water differences, influence the weather conditions in our area.

**Age of students**

14-15 years old

**Time**

Preparation time: 50 min

Teaching time: 3 x 50 min classes

**Teaching material**

Online:

Edmodo

Google Drive (Docs, Sheets, Slides)

OneDrive

Powtoon, Prezi etc.

MindMup 2.0 for Google Drive, draw.io

Padlet

Offline:

Weather instruments: thermometer, barometer, hygrometer, anemometer, SunSmart app or UVIMate app on Google Play, UV Index on Microsoft Store

Drawing materials (pen, pencils, markers, graph paper etc.)

**21st century skills**

 *How the lesson plan corresponds to 21st century skills. To find out more:* [*http://www.p21.org/our-work/p21-framework*](http://www.p21.org/our-work/p21-framework)

This lesson plan comprises several activities that help to achieve the skills defined as 21st century skills:

* **Collaboration:** Students willwork together when the activity requires them to work in groups to solve different problems or to create a presentation or a weather instrument.
* **Communication***:* The students must communicate their own ideas regarding the lesson’s topics. Students are required to use technology. The learning activity offers to the students the opportunity to choose the tool or tools that they will use to communicate.
* **Critical thinking:** The students will:
	+ Synthesize and make the connection between information and arguments;
	+ Interpret the data and will draw conclusions;
	+ Reflect critically on learning experiences, processes etc.
* **Creativity***:* The students will create a presentation (PowerPoint online, Google slides, Prezi, Powtoon etc.) in which they have try to give enough evidence in order to reject or confirm their hypotheses.

**Lesson Plan**

| **Name of activity** | **Procedure** | **Time** |
| --- | --- | --- |
| **Orientation** | The students learn about the concepts related to weather watching the following video and writing down all the concepts and keywords that they think are related to our topic. [What are the five elements of weather?](https://www.youtube.com/watch?v=hROAOnTPwo0) (<https://www.youtube.com/watch?v=hROAOnTPwo0>) | 20 min. |
| **Conceptualization** | In this phase the students will use the concepts they noted in the Orientation phase in order to create a concept map about weather variables (temperature, precipitation, humidity, wind speed and direction, air pressure, cloud cover and solar radiation) and will form groups to create specific hypotheses that they will investigate in the next phase.Students will discuss with the teacher about the conceptual map they created based on the following questions: * What is weather?
* What are the elements of weather?
* How are they measured?

Students in their groups formulate their hypotheses. | 30min. |
| **Investigation** | First, they will familiarize with weather instruments (*thermometer, barometer, hygrometer, anemometer etc.).* Following, they will proceed by carrying out their investigations and collecting data and information.Each group is going to specialize on one or two variables (temperature, precipitation, humidity, wind speed and direction, air pressure, cloud cover and solar radiation). Every team will investigate the variables assigned. Students will observe and record weather-related data for 7 days. | 30 min. |
| **Conclusion** | In this phase the students will use their previous work (hypothesis, data etc.) and write down the conclusions. The conclusions should be justified based on the evidence collected during the Investigation phase. Thus, the groups must prepare a presentation (PowerPoint, Google Presentations, Prezi etc.) about their conclusions in which*:** They must present the records containing their hometown’s weather data for 7 days, using the weather data collection chart and must interpret the information found in the chart and the graph;
* Will compare their data with weather data collection made by <https://www.meteoblue.com/en/historyplus>
* Will provide a report to the class;
* Will describe the weather and relate how weather affects their daily lives;
* Will investigate and understand how local geography influence weather of a particular region;
* Will show how the weather is reflected in the art using the resources on the *Europeana Collections* platform project (<https://www.europeana.eu/portal/ro>).
 | 20 min. |
| **Communication** | In the Communication phase the students will share their conclusions. This involves the description, criticism, evaluation and eventually discussing the whole process of investigation or a specific phase. Each group present the findings to the rest of the class. | 50 min. |
| **Extensions** | The students divided into teams will build instruments for measuring weather (barometer, rain gauge, wind vane, anemometer, thermometer) and explain and demonstrate how each instrument is used to measure weather. Students can record weekly weather data from the city they live in, using the weather data collection chart and then can provide a report to the class.  | 6 weeks |

**Assessment**

Pre-assessment:

KLW chart

Weather vocabulary

Formative assessment:

Checklist

Exit Slip

Peer/Self Assessments: Two stars and a wish.

Summative assessment:

Self-evaluation collaboration

Scoring Rubric for Mind Maps

Multimedia Presentation Assessment.

**Student feedback**

The students will engage in reflection activities which will help them to think critically about their own learning process. They will discuss with the teacher and their colleagues about their cooperation, as well as the tools and the labs used.

* Was it fun/ annoying/interesting/difficult/easy etc.?
* What went right?
* What didn't go so well?
* What you could have done differently?
* Do you think you have learned enough and how could you improve that? How can you make the lesson more interesting and fun?

The students will write their opinions about the lessons in a Padlet.

**About Scientix**

Scientix promotes and supports a Europe-wide collaboration among STEM (Science, Technology, Engineering and Mathematics) teachers, education researchers, policymakers and other STEM education professionals. If you need more information, check the [Scientix portal](http://www.scientix.eu/home), or contact either the [Scientix National Contact Point](http://www.scientix.eu/national-contact-points) or Scientix Ambassadors in your country.

**Resources**

<http://www.scientix.eu/resources/details?resourceId=10468>

<http://www.scientix.eu/resources/details?resourceId=10467>

<http://www.k12.wa.us/CareerTechEd/pubdocs/21stCenturySkillsinCTEResourceManual.pdf>

<http://worldweather.wmo.int/en/home.html>

<https://www.ncdc.noaa.gov/cdo-web/>

<https://www.meteoblue.com/en/historyplus>

<http://www.schrockguide.net/online-student-collaboration.html>

<http://www.schrockguide.net/assessment-and-rubrics.html>

<http://www.schrockguide.net/concept-mapping.html>