

**Erasmus+ Project WATER, A COMBINING ELEMENT.
Module 3: Environment and Climate Change**

Title	Module 3 ENVIRONMENT AND CLIMATE CHANGE
Aims	<p>With the help of this module, students should be able to:</p> <ol style="list-style-type: none"> 1. Be aware of water as a scarce resource in our lives (in family, work, and leisure settings). 2. Study the changes expected by the predicted climate change in our regions and investigate which measures have already been taken or should be taken by the participating countries to mitigate or adapt to the subsequent problems. 3. Organise and coordinate research with external partners such as water companies, environmental scientists and spatial planners as well as in regional archives and museums. 4. Determine the water consumption at their homes and schools and develop measures on how to adjust the water consumption to the respective environmental conditions in order to contribute to a sustainable management of this resource. 5. Be familiar with the different uses of water in domestic, agricultural and farming, industrial, and recreational settings, and understand their importance. 6. Develop critical environmental awareness, regarding schools as well, to adjust the own water consumption according to requirements needed. 7. Plan and launch an environmental campaign at the own school aiming at establishing an ecologically sensitive handling of water resources at schools.
Key competences	<p>With this module our students will develop the following competences:</p> <ol style="list-style-type: none"> 1. Linguistic competence: researching and understanding the information, knowing how to discuss it, and reaching agreements and communicating it. 2. Mathematical, science and technological competence, using mathematical tools to measure and learn about facts with precision, solve problems, discovering our relationship and our dependence on water in our environment. 3. Digital competence, using Internet, PCs, tablets, smartphones, etc. in the search of and the treatment of information. 4. Social and citizenship competence, working in groups in search of agreements. 5. Cultural expression and awareness competence, taking photographs, choosing songs and poems, drawing, designing infographs, etc. 6. Competence in learning to learn, encouraging us to enjoy the very process of learning and taking advantage of the previous knowledge of the unit. 7. Competence in autonomy, personal initiative and entrepreneurship, empowering the critical spirit in order to confront the theme of water and search for responsible solutions.
Methods	<p>We will follow different methods. We start with an initial test to discover previous knowledge of the unit so as to value and reflect upon it, taking it as a starting point. It can be done on Google Forms.</p> <p>We will use practical methodology based on tasks and projects, to be worked on different subjects, so that the module will be interdisciplinary and can be adapted to each school.</p>
Age	Range: 14-16.
Description	10 tasks composed of several activities are presented in the index and explained in detail in their corresponding annexes. We suggest an area or subject in which they can be developed. Most of them can be worked in class, but a few of them will need preparation and research at home, libraries or local archives.
Assessment	Each of the tasks will be assessed by the teachers who direct them, and also by the students themselves (co-evaluation and self-evaluation). Task 10 is also a self-evaluation test which can be done on Google Forms.
Necessary material	PCs, Projector, smartphone / tablet with access to Internet, camera, board, pens, etc



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TASKS	SUGGESTED SUBJECT / AREA
1. Previous knowledge. Initial Test.	ANY
2. Environmental awareness.	ENGLISH
3. Climate change in your region.	BIOLOGY/ HISTORY/ SOCIAL SCIENCE
4. Availability of water in your region.	GEOGRAPHY/ HISTORY/ SOCIAL SCIENCE
5. Measuring and saving water.	MATHS/ TECHNOLOGY
6. Micro-story contest. A dystopian world.	MOTHER LANGUAGE / ENGLISH
7. Debate. Is climate change actually a consequence of human actions? a. Annex 1. Rules of the debate. b. Annex 2. Assessment sheet. c. Annex 3. Fallacies.	PHILOSOPHY / SOCIAL SCIENCE
8. Environmental campaign.	ART/ ENGLISH/ TECHNOLOGY/ SOCIAL AND NATURAL SCIENCES
9. (OPTIONAL) Building a greenhouse in your garden, planting vegetables (or trees) that grow in our area and installing a drip irrigation system.	TECHNOLOGY/ MATHS / BIOLOGY/ P.E./ ENGLISH
10. Assessment. Final Test	ANY



TASK 1. PREVIOUS KNOWLEDGE

HOW MUCH DO YOU KNOW?

GROUP WORK In groups of 3-4 students, discuss and answer these questions. (Please, use this link on Google Forms: <https://goo.gl/forms/hyNMuErXU7kJyIQI2>)

1. What fraction of planet Earth is water-covered?
2. What is the chemical composition of water?
3. Where are the Earth's largest deposits of fresh water?
4. What is the most abundant type of water found in your surrounding area? Can you drink it?
5. Where does the water that you drink come from? Where does the water that you use at home and school come from?
6. Do you know any system for saving water? What measures would you take? List them.
7. In 2018 the Word of the Year was *microplastic*. Do you know what it means?
8. Are you currently aware of any problems concerning water related to climate change? List some of them.
9. Find out if your government has recently adopted any measures to protect the environment. Name them.
10. Regarding sustainable development, do you know what the 3 "Rs" are? (Reduce, Reuse, Recycle) Can you think of any other "Rs" which can help the environment? (E.g. Resist, Repair, Rethink, Recover, Reorganise, RESPECT, ...)



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TASK 2. ENVIRONMENTAL AWARENESS

I'M ONLY A CHILD, BUT...

You are never too small to make a difference
Greta Thunberg

You are going to watch two videos about two important speeches made by Severn Suzuki (1992) (<https://www.youtube.com/watch?v=kUDv-22Cfqg>) and Greta Thunberg (2018) (<https://www.youtube.com/watch?v=fITgbbA7MJs&t=2s>) in front of United Nations' leaders at a climate change conference.

SEVERN SUZUKI

At age 9, she founded the Environmental Children's Organization (ECO), a group of children dedicated to learning and teaching other youngsters about environmental issues. In 1992, at age 12, Suzuki raised money with members of ECO to attend the Earth Summit in Rio de Janeiro. (Wikipedia)

GRETA THUNBERG

Greta Thunberg is a 15-year-old climate activist with the Asperger's syndrome who is continuing her school strike each and every Friday to ask Sweden's government and other countries to act against climate change. (lifegate.com)

Before watching the videos

These words are going to appear in the videos. Are you familiar with them?



While you watch the videos

Answer the following questions:

- Why did Severn stop going fishing in Vancouver? _____
- Why was Severn shocked when she visited Brazil? _____
- Why does Greta talk about her 75th birthday? _____

After watching the videos

You will have lots of ideas and discomfort as a result of what you have listened to. Now, **it's your turn** to contribute to the **fight against climate change**. Do some research and find **news related to climate change** in your own country. Once you have learnt about these problems, write a letter to the representatives, politicians, delegates... in your country in charge of environment and state your discomfort and worries about your future.

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TASK 3. CLIMATE CHANGE IN YOUR AREA/REGION



LOOKING INTO CLIMATE CHANGE

1. Find out about climate in your area in the past 50 years. You can do your research on the Internet or you might need to refer to your local library or town archive.
 - i. Monthly average temperatures.
 - ii. Monthly amount of rainfall.Once you have collected your data, save them in a spreadsheet (i.e. Google Sheets, Excel, etc.)
2. Draw a climograph of your area showing average temperatures for every month of the year, together with amounts of rainfall. What type of climate does your climograph show?
3. Draw two graphs showing average temperatures in the past 50 years during:
 - i. The autumn and winter months (October-March)
 - ii. The spring and summer months (April-September)What do the graphs show? Have temperatures increased? Have they decreased? Have they remained similar?
4. Draw 4 graphs showing average amounts of rainfall in the past 50 years during:
 - i. The autumn months (September-November)
 - ii. The winter months (December-February)
 - iii. The spring months (March-May)
 - iv. The summer months (June-August)What do the graphs show? Has it rained more often in the past few years? Or have they been drier? Have they remained similar?
5. Find out about 5 episodes of heavy rain or floods in your area (within a radius of 300 km) in the past 50 years. Give a detailed account of the consequences (material damage, casualties, environmental effects)
6. Put all your results together in a document (i.e.: Google Slides, PowerPoint, etc.) and present it to your class.

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TASK 4. AVAILABILITY OF WATER IN YOUR AREA

THE WATER HOLE

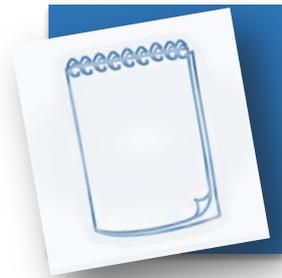
- 1) Find on the internet which are the most abundant water resources in your region (rivers, lakes, reservoirs, sea, ...).
- 2) Do research about how water has been used in your region historically.
- 3) Find out if the changes throughout history have been caused by climate change.
- 4) Present your results to your classmates.

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POURING RAIN

- a. Measure the amount of water you use at home with the “calculator” you will find in this link: <https://www.hunterwater.com.au/Save-Water/Water-Usage-Calculator.aspx>
- b. Save your results and email them to your teacher.



- c. You are going to use a pluviometer and learn to measure the amount of rainfall in your area over a two-month period (i.e.: 20th January-20th March). You will note these amounts daily in a shared Google sheet. Finally, draw a graph showing the weekly amounts of rainfall.
- d. Interpreting a water bill. Find out how much water you have actually used at home and at your school in the months of January and February. Then, check if the amount of water spent per person is equal to, more than, or less than the amount of rain that we’ve measured in the pluviometer.
- e. Think of actions that we can do every day at home to save water. List them. Calculate the amount of water you would be saving every month if you put those actions into practice.

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TASK 6. MICRO-STORY CONTEST. A DYSTOPIAN WORLD.

THIKING OUT OF THE BOX



BACKGROUND Year 2050. The Earth's average temperature is 5 degrees higher than in 2019. The last time it rained in your town, it caused terrible floods and hundreds of people got killed... tomorrow is the second anniversary of that appalling occurrence.

You have to write a micro-story which must begin the night before that second anniversary.

Maximum length: 150 words.

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ARE HUMANS RESPONSIBLE FOR CLIMATE CHANGE?

Global warming (or climate change) poses a very real threat to the world's ecosystem and to human life. Some doubt its existence and others believe that human activity is responsible for global increase in temperature and related weather phenomena. This debate takes it for granted that global warming exists but asks to what extent humans create or hasten those conditions.

ACTIVITY 0. You can enter in these two websites to introduce yourself to the debate of climate change.

INTRODUCTION (Prezi presentation)

<https://prezi.com/tddeteafw3gx/are-humans-responsible-for-climate-change/>

Physical and human causes of climate change: read the revision part and take the test.

<https://www.bbc.com/bitesize/guides/z3bbb9q/revision/1>

ACTIVITY 1. First of all, answer these questions:

- Are humans responsible for causing climate change?
- Regardless of whether we are responsible or not, do we have a responsibility to stop it?
- How do we balance environmental concerns with economic limitations?
- What are the ethical implications of climate change on human life?
- What does the future of climate change look like for humans?

ACTIVITY 2. Secondly, consider these ideas in order to support your position firmly. Try to create arguments to support these ideas and develop them more precisely:

IF WE ARE NOT RESPONSIBLE...

No, there is no proof that humans have affected the climate. The notion that humans have affected climate change on the planet is a claim with no real evidence. I think that there are many people who are trying to politicise the subject of the climate. Even though I do not believe there is a problem with climate change, I still think people should do their best to take care of the planet.

It is doubtful. There really is so very little that we understand about the climate and it is impossible to model for all of the variables. The climate change hypothesis also utilizes a very limited set of data and in some cases completely ignores parts of it that don't fit the hypothesis. That is not to say that we don't contribute. It's unthinkable that we don't contribute in some way, as does every living thing on Earth. Humans have only existed in an Ice Age, which we are currently still in, so we know the planet has been and can be a lot warmer naturally. But we don't know all of the reasons why or how and it is arrogant to claim that one knows for a fact what science actually hasn't established.

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IF WE ARE RESPONSIBLE...

Humans have changed the world but not just for the better. So, climate change is when the climate changes. But it has got out of hand. Ice caps are melting and animals are suffering. The gases causing climate change come from us, humans. Our lifestyle contributes to the emission of these gases. Scientists know about the ice age, not about the melting time! They have analyzed the past knowing it was only natural. But the present and future of global warming is from us. We need to take action, the world is changing because of our actions. NOW EVERYTHING IS IN OUR HANDS!

We are partly responsible. Yes, humans are responsible for some of the climate changes in the world. With our technology and processes going on consistently it is not hard to see that we have caused a lot of changes in the climate. I do not believe that we are the only ones to blame for climate change, but we have our hand in the pot.

Yes, humans are responsible for climate change today. Humans make all kinds of pollutants which do nothing but contribute to negative climate change. Until humans realize they are responsible for climate change they will do nothing about it and the Earth will continue to get worse and worse until it is basically unlivable.

I believe the Earth has natural warming and cooling cycles that we are not able to influence. Given the timing of the last ice age I would have to guess we are in a warming period and that will continue for many years to come. With that said, I think the pollution and greenhouse gases that we have released will make the warming period more difficult for us than it should be.

Yes, humans are responsible for today's climate change, which is affecting our environment. By failing to responsibly care for the resources we have been given, and by over-using materials such as spray cans, we have damaged our world and caused changes in our climate. Other activities such as cloud seeding may have far-reaching outcomes that we do not even realize yet.

ACTIVITY 3. Visit these websites. You will read arguments in favour and against the human causes for climate change.

- You can use them for the debate.
- You should think and write rebuttals to your opponents' arguments (they can use some of them in the debate too). Therefore, you must be prepared to be able to answer any kind of argument against your positions.

Arguing that humans cause / do not cause Global Warming

<https://www.reusethisbag.com/articles/global-warming-debate/>

https://en.wikiversity.org/wiki/Are_humans_the_main_cause_of_global_warming%3F

Top Pro and Con Arguments

<https://climatechange.procon.org/>



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ACTIVITY 4. Read these articles. You can use these data, examples and information to support your position in the debate.

WE ARE NOT RESPONSIBLE FOR CLIMATE CHANGE
<ul style="list-style-type: none">- The climate is changing, but not just because of humans: https://www.nbcnews.com/think/opinion/climate-changing-not-just-because-humans-here-s-why-matters-ncna824271- Nature, not humans, could be cause of up to half of Arctic sea ice loss, study claims: https://www.independent.co.uk/environment/arctic-sea-loss-ice-melting-nature-not-humans-responsible-up-to-half-study-claims-a7627616.html
WE ARE RESPONSIBLE FOR CLIMATE CHANGE
<ul style="list-style-type: none">- 10 Human Causes of Global Warming: https://www.reusethisbag.com/articles/10-human-causes-of-global-warming/- How Do We Know that Humans Are the Major Cause of Global Warming? https://www.ucsusa.org/global-warming/science-and-impacts/science/human-contribution-to-gw-faq.html#.XCj5xGhKjIU- Why scientists think 100% of global warming is due to humans: https://www.carbonbrief.org/analysis-why-scientists-think-100-of-global-warming-is-due-to-humans- Are human activities causing climate change?: https://www.science.org.au/learning/general-audience/science-booklets-0/science-climate-change/3-are-human-activities-causing

ACTIVITY 5. DEBATE. Now you have enough information and arguments to defend a position in a debate. It is advisable that you first read annexes 1 ([rules of the debate](#)), 2 ([assessment sheet](#)) and 3 (examples of good and bad arguments or [fallacies](#)).

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TASK 8. ENVIRONMENTAL CAMPAIGN

BE A PART OF THE SOLUTION, NOT THE POLLUTION

After studying the water consumption at your school and home, develop measures on how to adjust it to the environmental conditions in your area.

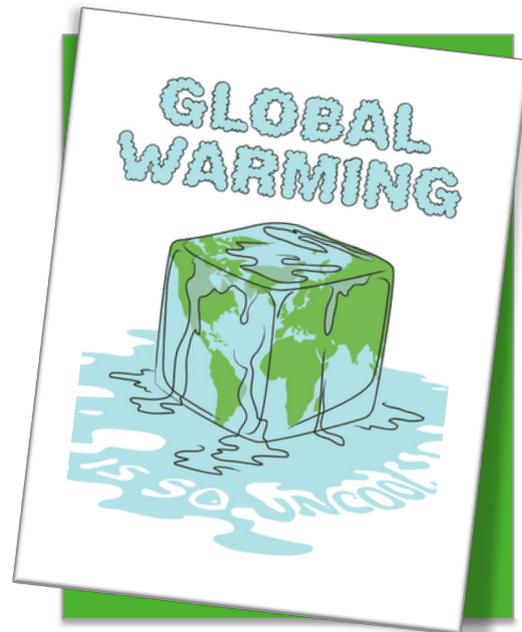
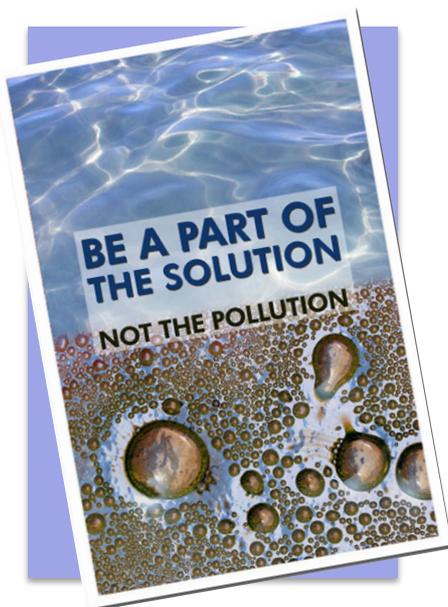
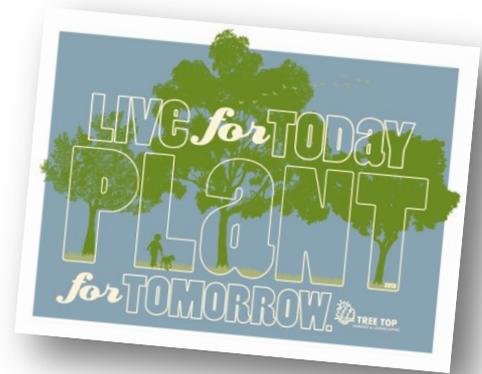
- Think of **slogans** to make people aware of using water wisely.
- Take **photos** to illustrate the slogans.
- Design **adverts** (infographics) to promote environmental awareness amongst the school community.

The **best** slogans, photos and adverts will be displayed at an **exhibition** to be held during the meeting in Vera, Spain.

- Make a **video** of you or/and your team mates showing actions you do to protect the environment and to promote sustainable development. (You may find some inspiration here: http://ec.europa.eu/clima/sites/campaign/resources/videos_es.htm)

The **best** videos will be uploaded to our website, and they will be **shown** on our Hall Screen (at IES El Palmeral) during the meeting in Vera.

- Organise a **conference** on environmental issues (already held at IES El Palmeral on 21st November, at 11:00: Basuras marinas: una marea global fuera de control (Sea rubbish: a global tide out of control) <https://youtu.be/YuSdqRN9aU>)



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BUILDING A GREENHOUSE AND DESIGNING AN IRRIGATION SYSTEM

The Project consists of designing and building:

- ❖ A greenhouse at the school garden, with a dripping irrigation system.
- ❖ A scaled model of the greenhouse, to be displayed at the school.

The Project must have the following **requirements**:

- ✓ Both greenhouses, the one built in the garden and the model, will be controlled by *Arduino Uno*, programmed by the students.
- ✓ A sensor will detect the plants humidity inside the greenhouse. When humidity is low, a pump will automatically start for irrigation.
- ✓ A sensor will check the temperature inside the greenhouse. When it is too high, a fan will start and the roof will open for ventilation.
- ✓ A permanent record of the temperature will be kept and shown on a screen. An RGB led will change its colour when the temperature changes.
- ✓ An anemometer will report on the wind speed.
- ✓ The functioning will be fully automatic and autonomous.

Should the Project be considered too complicated to be carried out, it could be **simplified** as follows:

- ✓ Only the model greenhouse will be designed and built.
- ✓ The Arduino Uno control system will be replaced by another one using analogic electronic circuits, using sensors, transistors and relays.
- ✓ The temperature sensor will only start the fan (the roof will not open).
- ✓ The RGB led will not be installed.
- ✓ The anemometer will not be installed.
- ✓ Only the humidity of the plants and the greenhouse temperature will be monitored.

At the end of the Project, the students will present their work both in English and in their local language with the help of presentation computer software. A report including budget and plans will be handed in.

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TASK 10. ASSESSMENT. QUESTIONNAIRE ON GOOGLE FORMS.

TEST YOURSELF

To access the Questionnaire and get feedback to your answers, click on this link:

<https://goo.gl/forms/Kax3teNvPcfJK9Bo1>

- 1) **How much water does an average family of four use every day?**
 - A. 200 litres
 - B. 380 litres
 - C. 950 litres
 - D. 1500 litres
- 2) **Which of these activities wastes the most water per day in the average home?**
 - A. Long showers
 - B. A leaky toilet
 - C. Water the plants with the hose
 - D. Running the tap while washing dishes
- 3) **What is smog?**
 - A. An elegant type of garment used by men for smoking.
 - B. A practical joke played on someone to laugh at him or her.
 - C. A thick type of fog that can be seen in some cities due to pollution.
- 4) **What is acid rain?**
 - A. Rain that falls on lemon trees
 - B. Rain that usually falls in places where the levels of pollution are high in sulphur dioxide and nitrogen oxide.
 - C. Rain contaminated with a drug that causes hallucinations.
- 5) **True or False.** The good side of acid rain is that it only affects those cities where it is generated.
(FALSE. Sulphur dioxide and nitrogen oxide can be blown by winds hundreds of kilometres and then get mixed with clouds in places where pollution was not generated)
- 6) **True or False.** 8000 lakes in Sweden have lost their fish due to acid rain.
(FALSE. 18000 thousand lakes have lost their fish, not "just" 8000.)
- 7) **True or False.** Governments usually follow up and fulfill the agreements signed at climate change conferences.
(FALSE. Countries such as USA, Australia, Russia, China and India did not comply with the UN Kyoto Agreement, which established that we had to reduce emissions of greenhouse effect gases by at least 5% before 2012)
- 8) **True or False.** Glaciers in the Pyrenees today cover a surface of 240 ha, almost 90% less than 170 years ago.



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(TRUE. Due to global warming, the area covered by glaciers has dramatically decreased: in 1850 they covered a surface of 2200 ha)

- 9) True or False.** Sustainable development implies going back to a primitive society, in harmony with nature.

(FALSE. Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs and without reducing natural resources)

- 10) Which of the following statements are TRUE?**

- A. The most important thing to protect the environment is to belong to an eco-friendly organisation.
- B. Using more water than we actually need does not damage the environment.
- C. In general, we must not waste paper, water, energy, or any other resources.
- D. Products with the European Green Label help us identify companies which respect the environment.



ANNEX 1. RULES OF THE DEBATE

1) THE TEAMS

Teams will be made at the beginning of the activity with the help of the teacher. Teams must be made up of a minimum of 3 members and a maximum of 5. One of the team members will be chosen as team captain. If a team had 5 members, one would be the captain, two would act as speakers and the other two would be the researchers. If the team had only 3 members, the roles of speakers and researcher would be alternated.

2) DEVELOPMENT OF THE DEBATE

Two teams will present their arguments in relation to the topic proposed, and challenge the arguments of the opposing team. At the beginning, the positions of for and against will be assigned randomly, and each team will have to defend their assigned position.

Debate interventions will be made in timed turns. See below:

- Team in favour: Team captain's opening intervention: 4 minutes.
- Team opposed: Team captain's opening intervention: 4 minutes.
- Team in favour: First rebuttal by speaker 1: 5 minutes.
- Team opposed: First rebuttal by speaker 1: 5 minutes.
- Team in favour: Second rebuttal by speaker 2: 5 minutes.
- Team opposed: Second rebuttal by speaker 2: 5 minutes.
- Team in favour: Conclusion made by the team captain: 3 minutes.
- Team opposed: Conclusion made by the team captain: 3 minutes.

When a speaker intervenes, he or she has to stand up and can use any resources available to him or her.

The members of each team can provide the speaker with written notes to support or advise him or her. It is the speaker who has to approach the table to collect the notes provided by the team members, and not the other way around.

During rebuttals, the members of the opposition team can challenge the speaker by raising their hands. The speaker can choose to listen to the interpellations or continue speaking, however if the speaker allows at least 2 interpellations during his or her turn, it will be evaluated positively later on.

Interpellations can last no longer than 15 seconds and they must be in the form of questions, allusions or clarifications. The time spent on interpellations will not be subtracted from the allocated time provided for the speaker.

The teacher will act as moderator and will:

- ✓ Control technical and normative aspects of the debate.
- ✓ Coordinate when each turn is taken.
- ✓ Ensure that the rules of the debate are followed.
- ✓ Resolve any possible conflicts.

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3) THE JURY AND THE VEREDICT

The classmates that are not part of the two debating teams will compose the jury. Within the jury, 4 students will be assigned as “NOTE-TAKERS” and 2 students will be assigned as SECRETARIES.

- a) **“NOTE-TAKERS”**: Four members of the jury will take notes of the debates. They must write the main arguments of each team clearly. When the debate is over, they will show these arguments and notes to the rest of the jury.

Thanks to the “NOTE-TAKERS”, the rest of the jury will be able to detect fallacies (bad arguments: ANNEX 3) and evaluate the good arguments.

- b) **JURY**: Each member of the jury will have to fill an assessment sheet (ANNEX 2). When they have finished filling it in, the members of the jury will give it to the SECRETARIES, who will tally the scores.

Once the scores have been tallied up, the secretaries of the jury will share the results with the moderator.



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ANNEX 2. ASSESSMENT SHEET

ASSESSMENT CRITERIA	TEAM A	TEAM B
<i>Each item is to be awarded 0, 1 or 2 points.</i>		
Variety of arguments employed		
Rigour and variety of evidence		
Engaging beginnings and conclusive endings		
Allowing interpellations from the opposition		
Not using fallacies (not using incorrect arguments)		
Agile answers		
Use of appropriate language		
Naturalness and expressiveness		
General attitude of the team		
GLOBAL ASSESMENT OF THE DEBATE	TEAM A	TEAM B
<i>Each team has to be awarded a mark ranging from 0 to 5 points. The total of both marks must add up to 5 exactly.</i>		
The team was more convincing and overall it deserves to win the debate.		
Total number of points for each team		



ANNEX 3. FALLACIES

We must learn how to argue correctly. Therefore, we should know the main difference between a good and a bad argument.

- **Argument:** a group of statements which serve (the premises) to support, imply, or provide evidence for another statement (the conclusion).
- **Premises:** set forth the reasons for the conclusions.
- We must distinguish between good and bad arguments. A **good argument** is one in which the premises support the conclusion.

A fallacy is the use of invalid or faulty reasoning in the construction of an argument.

- A fallacious argument may be deceptive by appearing to be better than it really is.
- Some fallacies are committed intentionally to manipulate or persuade by deception, carelessness or ignorance.

You cannot use fallacies when you are debating. Here you have the most common fallacies. If you use one of them, your opponent would realize that you are not answering his argument and you would be evaluated losing points in the debate.

Argument against the man (“ad hominem”):

- Unfairly attacking a person instead of the issue.
- Attacking the character and/or reputation of opposition’s supporters.
- The claim that a position is incorrect or an argument invalid because of something not about the position but about the person taking it.
- Example: “we cannot listen to John’s opinion on global warming because he is a tree hugger”.

Tu quoque:

- “Tu quoque” means “you too”. It appeals to hypocrisy, – the argument states that a certain position is false or wrong or should be disregarded because its proponent fails to act consistently in accordance with that position.
- Example:
 - Doctor: “You should quit smoking.”
 - Patient: “Look who’s talking! I will quit when you do.”
- Pattern:
 1. X fails to follow his or her own advice.
 2. Therefore, X’s claim or argument should be rejected

Unqualified Authority or Appeal to authority (“argumentum ad verecundiam”):

- When an arguer cites the testimony or belief of an authority who is not necessarily reliable or who is not an expert in the subject at hand.
- Example: “He has a PhD in Physics, that makes him a doctor, so we should ask him if I have Swine Flu.”

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- Appeal to authority is a common type of argument which can be fallacious, such as when an authority is cited on a topic outside their area of expertise or when the authority cited is not a true expert.

Appeal to ignorance (“argumentum ad ignorantiam”)

- When the premises state that nothing is known with certainty about a certain subject, and the conclusion states something definite about that subject.
- Example: People have been trying for centuries to disprove the claims of astrology. But no one has ever succeeded. So astrology is just nonsense.
- Assuming that a claim is true because it has not been or cannot be proven false, or vice versa.

Appeal to pity (“argumentum ad misericordiam”)

- An argument attempts to induce pity to sway opponents.
- It is a fallacy in which someone tries to win support for an argument or idea by exploiting his or her opponent's feelings of pity or guilt.
- Example: our Company is on the rocks, financially, if you sue us, we will go out of business, and our children will not be able to go college.

False cause (“Post Hoc”)

- It is a faulty assumption that correlation between two variables implies that one causes the other.
- "Since event Y followed event X, event Y must have been caused by event X."
- Citing a false or remote cause to explain a situation. “After this, therefore because of this”
- Assuming that because two things happened, the first one caused the second one.
- Example: “Every time my brother Bill uses hairspray, it is an extremely hot day”.

Appeal to the people (“argumentum ad populum”)

- A proposition is claimed to be true or good solely because many people believe it to be so. "If many believe so, it is so."
- Example: Everyone's doing it, therefore it must be good.
- Example: The majority of this country voted for this president, therefore this president must, objectively, be a good President.

Slippery Slope

- Implying that one small step in the wrong direction will cause catastrophic results.
- Example: “If we use just one more can of hairspray this month, earth as we know it will no longer exist”.
- Asserting that a relatively small first step inevitably leads to a chain of related events culminating in some significant impact/event that should not happen, thus the first step should not happen.

Hasty generalization

- An inference drawn from insufficient evidence.



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- Example: “It is warmer this year in Vera as compared to last year; therefore, global warming is rapidly accelerating”.

Circular reasoning (“circulus in demonstrando”)

- When the reasoner begins with what he or she is trying to end up with; sometimes called assuming the conclusion.

