

## O4. Methodological Guide for Teachers. ODYSSEY: Oxford Debates for Youths in Science Education”

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“Profound thoughts arise only in debate, with  
a possibility of counterargument, only  
when there is a possibility of expressing  
not only correct ideas but also dubious ideas...”

Andrei Dimitrievich Sakharov (1968), in  
*Progress, Coexistence, and Intellectual Freedom*

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## 1. Abbreviations

CLA.F.= Classroom Format

CON.F.= Contest Format

C.S.= Constructive Speech

R.S. = Rebuttal Speech

S.R. = Summary Rebuttal

F.F.R.= Final Focus Rebuttal

F.R.T.=First Research-Team

P.F.=Public Forum (debate)

S.R.T.= Second Research-Team

## 2. Preface

The methodological guide O4 is one of the intellectual outputs of the European Erasmus+ KA2 project **ODYSSEY: Oxford Debates for Youths in Science Education**. If *Odyssey*, the epic poem of Homer intended to describe to the audience the adventures of the Greek hero Odysseus during his journey home after the fall of Troy, the Erasmus+ KA2 project ODYSSEY is attempting to describe, in a symbolic analogy, an innovative educational adventure of European students and teachers during their journey to knowledge in the STEM field. In particular, this manual attempts to provide all the students and teachers, who will be involved in the project, with the necessary knowledge that will increase their confidence (McNeill et al., 2016) about the use and teaching of argumentation and debates as an essential educational tool within STEM Education.



The reason that justifies this choice is that debate consists of a discursive arena within which various essential human skills are meeting: reasoning skills, argumentative skills, persuasive skills, linguistic skills, critical thinking, creative skills, communication skills as active listening, oral speaking, use of body language, humor and, undoubtedly, cognitive skills. As a result, the participation to debates is related to the development of democratic citizens who accept and respect the diversity of opinions during their discussions and negotiations. In more, debates' participants are the future media literate citizens and critical consumers who won't be easily deceived by 'fake news'.

In particular, the methodological guide O4 is composed by the following parts:

- a) **The Letter for the Teachers**. It welcomes all the teachers who will be involved in the Erasmus+ KA2 project ODYSSEY sharing with their students the teaching experience of debating STEM topics.
- b) **The Code of the Debater**. Participating to a debate consists of an Ethos training. The code of the debater aims to remind it to the participants.
- c) **The Introduction**: The introduction part briefly presents the importance of scientific controversies and debates through the students' development of argumentation skills to the teaching of STEM.
- d) **The Debater's Toolkit**. It aims at fully describing the debating process. First, introductory information on ODYSSEY-Scientific Debate, as a discursive and scientific event, is given. Then, the proposed formats of ODYSSEY-Scientific Debate are presented: a) the **Classroom Debate Format (CLA.F.)** and b) the **Contest Debate Format (CON.F.)**. Both, they are chosen for the students' practice in classroom and in contests for the sake of the Erasmus+ KA2 project ODYSSEY, inspired by the philosophy of Oxford and Public Forum Debates.



Afterwards, the structural parts of ODYSSEY Scientific Debate are presented in details as well as the electronic devices or mobile tools such as Sli.do (<https://www.sli.do/>) or Mentimeter (<https://www.mentimeter.com/>) that will facilitate the participation of the audience to its implementation. All the above information combined with rules for all the participants to the debating process and

with tips aim to provide students and teachers with all the necessary information that will facilitate the preparation of student's performance to the final debating contest.

- e) **Appendices.** The appendices part provides the organizing committee of the contest, the judges, the time-keeper, the moderator etc. with all the necessary papers and evaluation sheets that are necessary for conducting the debate in classroom and in contest as well.

The **Appendix 1** presents Student's short biographical account for CON.F. Debates.

The **Appendix 2** presents the opening speech of the moderator/chairperson as it usually occurs in school debates world-widely.

The **Appendix 3** consists of the evaluation sheet of the audience, which will give written feedback to the researchers-debaters relative to their performance.

The **Appendix 4** is the evaluation sheet of the judging scientific committee of ODYSSEY Scientific Debate and it is individually completed by each judge during each round of debate.

The **Appendix 5** gives a detailed descriptive analysis of performance in ODYSSEY Scientific Debate according to the proposed standards and the range of marks. It has to be carefully examined by the judges and the coaches as well.

The **Appendix 6** is the ODYSSEY Scientific Ballot which is completed by the chief-judge in the end of each round taking in consideration the marks of each judge. The ballot is given to a member of the organizing committee in the end of each round.

The **Appendix 7** is the timekeeper's sheet which is also given to the chief-judge in the end of each round for contributing to the evaluation of the methodology standard for each team.

We truly wish that the guide O4 will cover all the needs of the participants for conducting successful and interesting debating games in STEM Education. Think and search like a scientist, argue like a lawyer, communicate like a leader and enjoy like a child! Debate and have fun!



### 3. Letter for the teachers

Teaching debate will be one of the most interesting, challenging and rewarding experiences you will have as a Science educator. As a modern Odysseus, you will extend your personal boundaries of knowledge in your scientific cognitive field and you will develop essential life skills. You will share the same experience with your students either you are a teacher of Junior High School (students of 12-15 years old) or of a Senior High School (students of 15-18 years old).



Undoubtedly, this experience will, also, be demanding. It takes a great amount of inquiry, planning, guidance of students along the way, and the ability to be as critical as possible while offering constructive and affirming feedback to them as a mentor.

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"What do we need to get started?" is "Less than you think." You need a basic understanding of how a debate works, a willingness to try out different speaking and listening exercises, exciting motions that bring people in to participate in debates, and an open and welcoming environment (Smith, 2011:17).

---



Early in the apprenticeship, there is a great deal of conceptual knowledge that, you, and your students must gain, since the implementation of debate in classroom or within a contest signals the final station of a prior journey in the land of argumentation. First, basic notions of argumentation theory must be examined and understood before their conscious use by the students in Science's context. Students have to learn how to structure an argument for expressing their scientific positions on a topic and how to provide

reliable evidence for supporting their proposals. Also, the deep knowledge of argumentative notions will also facilitate the recognition of fallacies and, consequently, the enhancement of students' critical thinking. In this way, the content of the students' speeches will be ensured.

Later in the apprenticeship, it will be clearly understood that the content of an argument is not always sufficient for convincing the audience about the soundness of its scientific truth. In this moment, you will realize the importance of sharing with your students communication techniques that will enhance their arguments' presentation of their arguments. For example, the tone and volume of the voice, the speech tempo, hand gestures, eye contact, the body position as well as the use of notes, will arise as important factors that influence the delivery of the selected arguments.

For achieving all the above goals, communication and collaboration between you and your students must be developed. Argumentative linguistic games and oral or written activities will facilitate the practice and the experiential character of learning. During this period, it is important that, you engage, as instructor, with the students to ensure they are on-task and on-track, because of the limited time you have at your disposal for preparing a debate. The educational packages on STEM issues will facilitate your task, since they will provide you with the necessary material and reliable sources for constructing your arguments during your classroom debates.

In more, keep in mind that besides the classroom debates that you will conduct with your students, in the end of the school year, your team will be asked to participate to competitive debates with students from other schools that participate to the project ODYSSEY. For this reason, it is important to learn the basic set of methodological rules and principles that direct the organization of a schools debating competition. In this way, your students will be ready to better unwrap the argumentative skills in STEM that you have developed during the whole school year! Also, all the students have to get familiarized with digital applications that will facilitate their active involvement during the debate through the asking of questions to the debaters as well as through their initial and final votes.

During the training of your students you can enhance your collaboration with other colleagues from your field or from different fields. For example, a teacher of Language Arts who is expert in debating, might support you in your first steps in debating STEM topics with your students enhancing at the same time their linguistic skills! In more, you will have the opportunity to get acquaintance with scientists and researchers!!!

But the most important is that you have to teach your students **ETHOS**. Getting involved in a debate means that you consciously want to become a better person (Quintilian used to say "*vir bonus*"), both as individual and as citizen. Debate is interwoven with the notions of respect, tolerance, acceptance of the different opinion, freedom of speech. That's why we suggest you to start your lessons by learning, first, and teaching, then, to your students the code of a debater (Snider, 2008) as it is presented in the next chapter of this guide.



In more, the notion of the audience is crucial during the implementation of a debate. As teacher, you have to provide the students that compose the audience with the necessary objective standards for evaluating the best debating. In other words, you have to teach and develop critical thinking skills to the future citizens of the world!

It sounds like a quite interesting adventure. Enjoy it!!!

#### 4. The Code of the Debater (Snider, 2008:16)

##### **I am a debater.**

I attempt to be worthy of this title by striving to observe the code of the debater.

##### **For Myself**

I will research my topic and know what I am talking about.

I will respect the subject matter of my debates.

I will choose persuasion over coercion and violence.

I will learn from victory and especially from defeat.

I will be a generous winner and a gracious loser.

I will remember and respect where I came from, even though I am now a citizen of the world.

I will apply my criticism of others to myself.

I will strive to see myself in others.

I will, in a debate, use the best arguments I can to support the side I am on.

I will, in life, use the best arguments I can to determine which side I am on.

##### **For Others**

I will respect their rights to freedom of speech and expression, even though we may disagree.

I will respect my partners, opponents, judges, coaches, and tournament officials.

I will be honest about my arguments and evidence and those of others.

I will help those with less experience, because I am both student and teacher.

I will be an advocate in life, siding with those in need and willing to speak truth to power.



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## 5. Introduction

In Science, like in everyday life, controversies occur all the time. Scientists debate about the methods which are used for conducting an experiment, about theories that explain certain phenomena, about various research hypothesis.

In such cases, scientists as orators state their claims upon an issue and search for more evidence in order to better support their claims. So, within the scientific context, controversy is interwoven with the promotion of research and the development of Science itself, while, often, it deals with socio-scientific issues with great impact to human life (Oulton et al., 2004).

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In science it often happens that scientists say, 'You know that's a really good argument; my position is mistaken,' and then they would actually change their minds and you never hear that old view from them again. They really do it. It doesn't happen as often as it should, because scientists are human and change is sometimes painful. But it happens every day. I cannot recall the last time something like that happened in politics or religion." (Carl Sagan: <https://www.goodreads.com/quotes/8385-in-science-it-often-happens-that-scientists-say-you-know>)

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What is the most important is that controversy as a process for examining issues such as, for example, the evolution or the climate change, is considered not only "a particularly attractive strategy" (Klumkowsky, 2017), but, also, an essential teaching practice in the fields of **Science**, **Technology**, **Engineering** and **Mathematics** or in other words within the frame of **Stem Education** (White, 2014). Both, controversy and STEM Education are related to inquiry and problem-based learning (Nite et al., 2017:34), since controversial issues, due to their nature, don't provide neither teachers nor students with "fixed or universally held point of view" (Crick, 1998: 56).

Within this framework, controversies attribute to the students' knowledge building process through "the movement toward argumentation" (Hanauer et al., 2009:16) and, consequently, through the use of debates or even the participation to debating competitions (<http://www.reddstar.eu/debating-science-issues-dsi-2015/>) for examining both sides of a scientific or socio-scientific issue.

The turn to argumentation and, in particular, to debate is, exactly, the goal of the project **ODYSSEY: Oxford Debates for Youths in Science Education** for promoting STEM education. Many teachers consider that "STEM subjects sometimes require going in from a different angle – like debating" and that "debate sparks students' interest in STEM" (Reid, 2017), while, as educational strategy, debate may be related to the development



of life skills or “4Cs super skills” (Kivunja, 2015) such as communication, critical thinking, creativity and collaboration.

Additionally, the development of students’ oral argumentation during the debates facilitates the presentation and debate of scientific theories based on evidence (Osborne, 2010), while at the same time it enhances their reasoning, critical thinking and communication skills (Jimenez-Alexandre & Erduran, 2008) enriching their content knowledge on scientific issues (Venville & Dawson, 2010).

In more, in USA argumentation and, consequently, debating are related to the *Next Generation Science Standards (NGSS)* (NGSS Lead States, 2013) as core practices which highlight that Science doesn’t consist only of “a set of facts” (McNeilla et al. 2016, 2027). For example, a NGSS Performance Standard requires students to be able to: “Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.” (<https://www.nextgenscience.org/topic-arrangement/hswaves-and-electromagnetic-radiation>).

So, **if you are a teacher who wants to cultivate:**

- a) the reasoning and cognitive skills of your students in STEM and
- b) their comprehension and knowledge of real phenomena and scientific theories,

**don’t hesitate to use argumentation and debate.** Besides the benefits in the scientific field, students:

- will learn to express more accurately their ideas in the mother language,
- will acquire important argumentation and communication skills, useful in their daily life,
- will become critical learners and thinkers.
- Students will learn to lose and win with grace and respect for the winner. Debate will become a life lesson for them.

In other words, you will contribute to the development of democratic citizens within the modern era who accept and respect the notion of diversity in every situation, discussion or negotiation in their life. The time has come! Seize the opportunity!

## PART A

### The *ODYSSEY* Debater's Toolkit

Rules

Advices

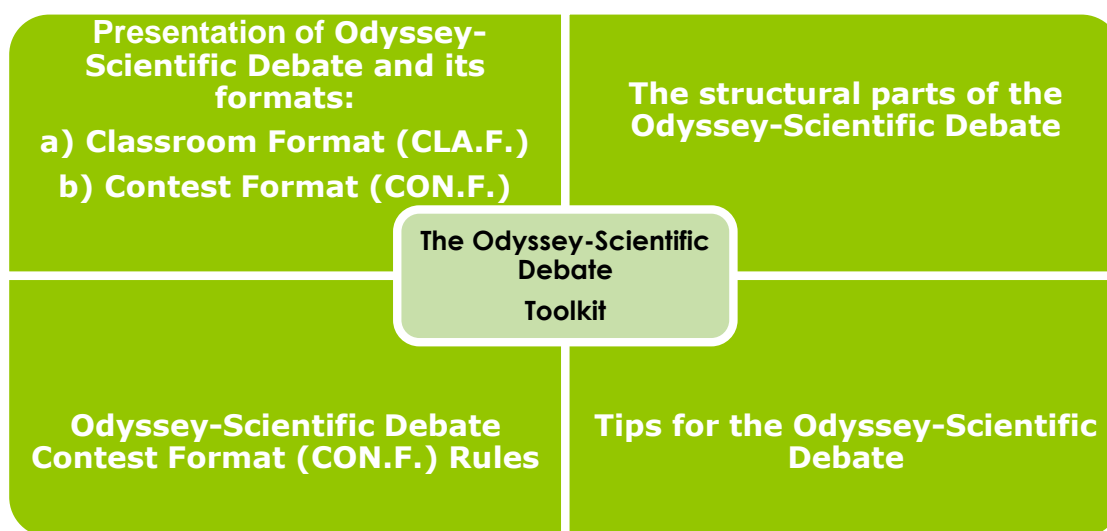
Tips

Structural  
Parts



## 6. The debater's toolkit: General information

The current part of the manual O4 will provide you and your students with the necessary information about the rules and principles that will organize the implementation of the Erasmus+KA2 project **ODYSSEY: Oxford Debates for Youths in Science Education** in the classroom context (CLA.F.) and in the contest context (CON.F.) (See Tables 1 and 2). Their knowledge will facilitate the debates' organization and realization. The presentation of the relative material will be divided in the following four parts:



### 6.1. Presentation of ODYSSEY-Scientific Debate

The format of the Erasmus+ KA2 project **ODYSSEY: Oxford Debates for Youths in Science Education** is inspired by:

- a) Oxford Debates and
- b) Public Forum Debates (National Forensic League, 2009).

**Which are the influencing factors** of the two pre-mentioned formats?

- a) The **audience**. The participation of the audience is essential and necessary in both formats. The initial and the final vote of the audience indicate the winning team within the CLA.F. context. On the opposite, within the CON.F. context, it indicates the preference of the audience but not the final winning team.
- b) The thorough examination of the controversial topic.
- c) The invention and use of high-quality arguments and counter-arguments.
- d) Debate is a formal interactive process of dynamic exchanging of reasonable arguments about a controversial topic or resolution or motion for supporting a certain claim after

having conducted a thorough inquiry on it (Freeley and Steinberg, 2009:3) in equal and adequate time.

The **ODYSSEY-Scientific Debate** represents an interactive scientific team event that advocates or rejects a scientific position about a controversial scientific topic. The event takes place in front of a layperson audience through the exchange of arguments between students after a thorough inquiry on the topic. The chosen format permits students to cultivate their argumentative, communication and critical skills by sharing effectively their scientific knowledge on STEM topics with their peer-mates during the debate, facilitating “genuine episodes of learning themselves” (Wolf, 1993:213).

The ODYSSEY-Scientific Debate puts emphasis to the acquisition and sharing of **knowledge**. For this reason, debaters must:

- conduct and demonstrate a thorough research,
- use reliable sources,
- cite their sources during the debates,
- perform deep understanding of the topic, quality of evidence and persuasiveness.

In the same line, the successful delivery of the produced argumentation must be characterized by clarity, eloquence, textual organization, cohesion, and logic.



### The research teams

As in any debate, the ODYSSEY-Scientific Debate is implemented by two teams, which will be called **research-teams**:

- a **proposition research-team** (for the resolution), and
- an **opposition research-team** (against the resolution).

The duty of the proposition research-team/affirmative side is to support the truth of the resolution, while the opposition research-team has to refute it for supporting its truth.



### The researchers-debaters

The speakers of each research-team are called **researchers-debaters**. They conduct an organized and systematic investigation into STEM topics for inventing appropriate and sound arguments that support their case and for successfully communicating them to the audience.

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For practical reasons, each research-team is composed of **three (3) researchers-debaters** instead of two (vs. Public Forum Debate format). The **first debater-researcher (1<sup>st</sup> round)** is responsible for constructing the case and advancing the more important arguments of the research-team. The **second one (2<sup>nd</sup> round)** is responsible for refuting the opposite arguments and advance more the thesis of her/his own research-team. The **third player (rounds 3 and 4)** is responsible for the summary rebuttal and the final focus rebuttal, while he/she doesn't participate to the cross-fires.

### The goal

The **goal** of the debate for each research-team is dual:

- a) **to convince the audience** of the scientific validity of their position (CLA.F. and CON.F.) and be voted by the audience and
- b) **to convince the Judging Scientific Committee** of the validity of their position in order to gain its recognition. In other words, the goal of each research-team is to gain **both the prize of the audience as well as the prize of the Judging Scientific Committee that determines the winning research-team.**

### The topics

The debates' **topics or resolutions** are related to STEM issues which are examined within the five (5) educational packages of the project ODYSSEY. The topics are written into the national language of each participant country and stem from inquiry based upon reliable scientific sources.

Additionally, there are fifteen more educational packages (15) written in English, which examine topics for further debating practice. The topic(s) of the contest will be given in the national language of each participant country and will be chosen by the organizing committee of the contest approximately twenty minutes (20') before its opening.

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The topics take the form:  
**"This research-team supports that..."**

---

The topics or resolutions are discerned to three categories.

In the case of **fact resolutions**, the researchers-debaters have:

- (i) to use factual arguments, which are related to logic and evidence for supporting their thesis and
- (ii) prove that a thesis is true or false.

For example: *Parallel circuits consume more energy than series circuits* (**fact resolution**).

The debaters can use the Aristotelian "non-artistic" means of persuasion (Aristotle, 1995; Egglezou, 2017:404) such as statistics, laws of science etc., for demonstrating, for example, that the climate change is irreversible. The opposition of scientific ideas on the topic must be delivered by the researchers-debaters in a persuasive manner to the

audience that represents the general public of non-scientists. The use of humor is acceptable if it is decent and moderate.

In the case of **policy resolutions**, the researchers-debaters have to propose a specific action, to reveal the consequences of a future modification. For example

*In mid-latitudes we should invest rather in wind than solar energy production (policy resolution).*

In the case of **value** resolutions, the researchers-debaters have to make a judgment on a certain issue (e.g. the efficiency of a scientific method). In this case, the affirmative research-team has to set the criteria that apply to the judgment (Erickson et al., 2003:7). For example:

*In mountainous catchments, hydrotechnical solutions are more efficient for flood protection than nature-based solutions (value resolution).*

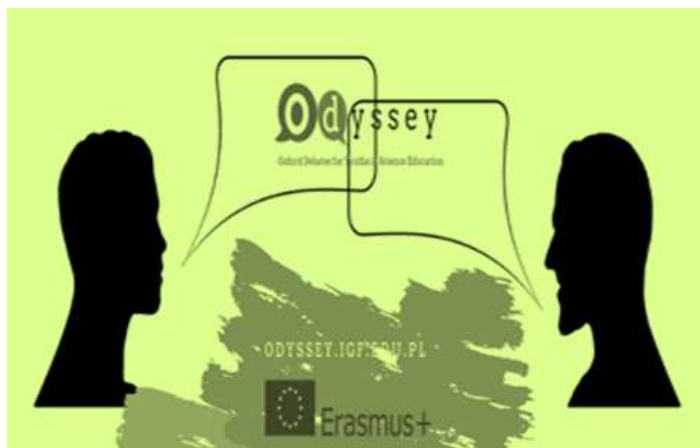
## 6.2. The formats of ODYSSEY-Scientific Debate

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The format of ODYSSEY-Scientific Debate is presented in two variations:  
a) the **Classroom Format (CLA.F.)** and b) the **Contest Format (CON.F.)**.

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The first variation of the classroom format (CLA.F.) lasts forty five (45) minutes and is responding to the limitations of time within the school-context (a didactic hour lasts 45'). (See Table 1).



The variation of the contest format (CON.F.) lasts approximately eighty-two (82'-90') to ninety minutes (see Table 2). It introduces the Judging Scientific Committee which is composed of three judges. The judges are expert on debate and science issues, scientists or educators. The judging committee poses at least one question to the first two researchers-debaters of each research-team. If time remains, the

format allows the energetic participation of the audience through the posing of more questions on the first and second researcher-debater of both research-teams.

**A.THE CLASSROOM DEBATE FORMAT (CLA.F.)**

<b>SPEECHES AND ROUNDS</b>	<b>TIME</b>
Opening of the debate by the moderator/chairperson	3 minutes
Initial vote by the audience	2 minutes
1 <sup>st</sup> Researcher-Debater of the A research-team: Constructive Speech	4 minutes
1 <sup>st</sup> Researcher-Debater of the B research-team: Constructive Speech	4 minutes
Cross-fire between the researchers-debaters (1) of both research-teams	3 minutes
2 <sup>nd</sup> Researcher-Debater of the A research-team: Rebuttal Speech	4 minutes
2 <sup>nd</sup> Researcher-Debater of the B research-team: Rebuttal Speech	4 minutes
Cross-fire between the researchers-debaters (2) of both research-teams	3 minutes
Preparation time for the Summary and Final Rebuttal by both research-teams	2 minutes
3 <sup>rd</sup> Researcher-Debater of the A research-team: Summary Rebuttal	2 minutes
3 <sup>rd</sup> Researcher-Debater of the B research-team: Summary Rebuttal	2 minutes
Grand Cross-fire between the researchers-debaters (1 & 2) of both research-teams	3 minutes
3 <sup>rd</sup> Researcher-Debater of the A research-team: Final Focus Rebuttal	2 minutes
3 <sup>rd</sup> Researcher-Debater of the B research-team: Final Focus Rebuttal	2 minutes
Final vote by the audience / Short written feedback	3 minutes
Presentation of the results by the moderator	2 minutes

**Table1:** The Classroom Debate Format (CLA.F.)

<b>B. THE CONTEST DEBATE FORMAT (CON.F.)</b>	
<b>SPEECHES AND ROUNDS</b>	<b>TIME</b>
Opening of the debate by the moderator/chairperson	5 minutes
Initial vote by the audience	3 minutes
1 <sup>st</sup> Researcher-Debater of the A research-team: Constructive Speech	4'-5' minutes
1 <sup>st</sup> Researcher-Debater of the B research-team: Constructive Speech	4'-5' minutes
Cross-fire between the researchers-debaters (1) of both research-teams	3 minutes
2 <sup>nd</sup> Researcher-Debater of the A research-team: Rebuttal Speech	4'-5' minutes
2 <sup>nd</sup> Researcher-Debater of the B research-team: Rebuttal Speech	4'-5' minutes
Cross-fire between the researchers-debaters (2) of both research-teams	3 minutes
Preparation time for the Summary and Final Rebuttal by both research-teams	2 minutes
3 <sup>rd</sup> Researcher-Debater of the A research-team: Summary Rebuttal	2'-3' minutes
3 <sup>rd</sup> Researcher-Debater of the B research-team: Summary Rebuttal	2'-3' minutes
Grand Cross-fire between the Researchers-Debaters (1 & 2) of both research-teams	4' minutes
Critical Time for the judges and the audience: Both the judges and the audience pose questions to the first two Researchers-Debaters (1 & 2)	12' minutes
3 <sup>rd</sup> Researcher-Debater of the A research-team: Final Focus Rebuttal	2'-3' minutes
3 <sup>rd</sup> Researcher-Debater of the B research-team: Final Focus Rebuttal	2'-3' minutes
Final vote by the audience / Short written feedback	3 minutes
Board Meeting of the Judging Scientific Committee / Announcement of the audience's initial and final votes by the moderator	15 minutes
Announcement of the Judging Scientific Committee votes by the moderator	3 minutes
Awards	5 minutes

Table 2. The Contest Debate Format (CON.F.)

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### 6.3. The structural parts of ODYSSEY-Scientific Debate Format

In this part of the guide O4, the structural parts of ODYSSEY Scientific Debate are presented as regards both variations (CLA.F. and CON.F.). Debate consists of a formal type of dialogue. So, participants might follow a necessary and 'ritual order' within each structural part and respect all the proposed rules and principles.

#### 6.3.1. Before the opening of the debate: Pre-round preparation

Necessary actions before the opening of the debate are:

a) The **toss of a coin** either by the **teacher** (CLA.F.) or by a member of the organizing committee of the contest (CON.F.). This method determines **either** which research- team will be affirmative or negative **or** which research-team will speak first in order or second. For example, if the winning research-team chooses to be negative then the losing research-team will decide in which order wants to present its arguments (first or second) (National Forensic League, 2009). These choices are related to the possibilities and limitations of both research-teams (e.g. If the research-team is obliged to be negative, it can choose to speak second, if the last researcher-debater might give an impressive final focus rebuttal etc.). In all cases, this method does not guarantee that the first constructive speech (C.S.) is the affirmative one.



b. The **announcement of the topic** either by the educator (CLA.F.) or a member of the organizing committee (CON.F.). In the CLA.F. debate the topic is announced a week before the debate, while in the CON.F. debate the topic is announced twenty minutes (20') before the beginning of the debate.

c. In the CLA.F. debate the **preparation time** lasts one week. During this period, students study the material, in order to discover definitions and arguments for and against the topic, to exchange ideas on it, to find reputable, reliable, verifiable, authoritative and recent sources of knowledge (National Speech and Debate Association, n.d.:<https://1.cdn.edl.io/0dVWk0l16cLmIZWiJn5xaYKiudyr8vmwnfpxMPbUzuWDUokW.pdf>), while they don't have time of preparation just before the opening of the CLA.F. debate because of the lack of time.

In the CON.F. debate the preparation time lasts twenty (20') minutes. The resources at students' disposal are: a) the other members of the research-team, b) written material (ideas on the topic/for and against it, related articles and background information, scientific examples, statistics etc.).

During the preparation period (either in CLA.F. or in CON.F.) the delegation of tasks between the debaters-researchers is important.

In particular, students:

- decide on their **order of speech** (the duties of each one are described in the following chapters of the guide),
- share their knowledge on the topic by writing down their definitions of the key-terms of the topic,
- write down the main arguments,
- write down foreseen counter-arguments and rebuttals of the opposite research-team,
- prepare sound responses-rebuttals for defending their thesis, according to the method described within the intellectual output O8 of the project ODYSSEY, called *“Educational packages for students”*. In more, students:
  - ‘split’ their arguments between them promoting co-operation,
  - deploy the particular skills (e.g. humor), interests and knowledge (e.g. expertise in nano-technology) of each participant for ensuring the optimum conduct of the debate for their research-team.

During the preparation period of a CON.F., **it is not allowed to:**

- discuss with other familiar persons (teachers, friends, family members etc.).
- Students can only be addressed to the members of the organizing committee of the debate contest, if they want to pose a question on the announced topic or to clarify some obscure term,
- search for information on the Internet or use any electronic device.

Finally, before the opening of the CON.F. debate the researchers-debaters give to the moderator their **short biographical account** (see Appendix 1) for being presented to the audience.

### 6.3.2. Opening of the debate

In CLA.F. debate the opening phase lasts three minutes (3’), while in the CON.F. debate lasts five minutes (5’). The opening of the debate is directed by the **moderator or chairperson**, whose job is to ensure the regular conduct of the debate and the compliance with the rules of the debating process.

In particular, in the opening of the CON.F. debate, the moderator or chairperson:

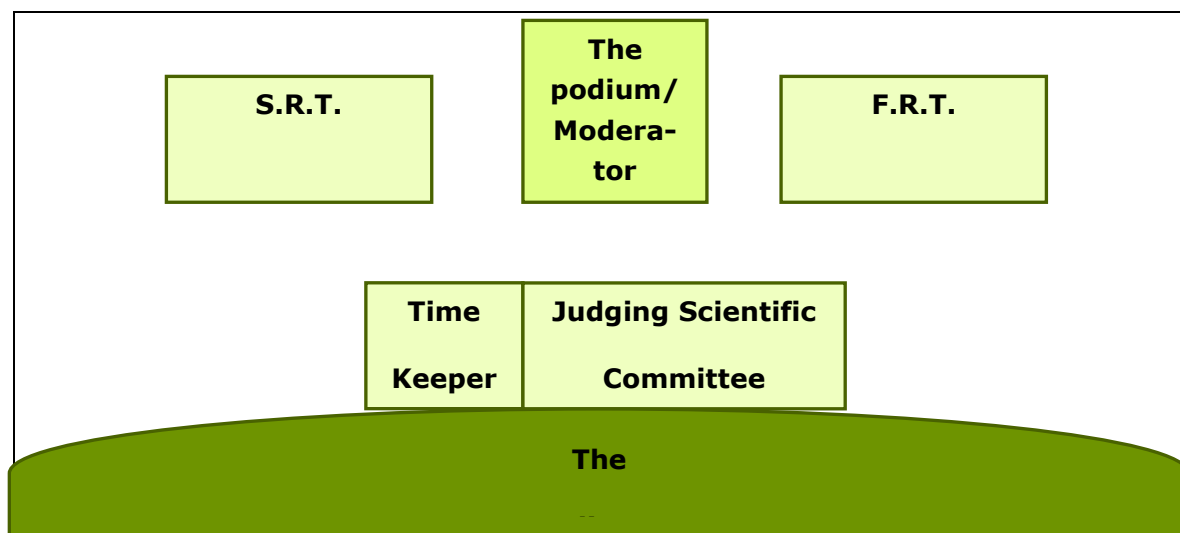
- a) He/she announces the opening of the debate and welcomes the audience.
- b) He/she welcomes the invited scientists/members of the Judging Scientific Committee and introduces them.
- c) He/she introduces the timekeeper and asks him/her to demonstrate the sound of warning.



- d) He/she introduces properly the researchers-debaters according to the short biographical account given to him before the opening of the debate (see Appendix 1).
- e) He/she announces the resolution to be debated.
- f) He/she asks the audience to give its initial vote on the topic, based on prior knowledge, beliefs, opinions etc. There are three alternatives for voting: *For the motion, Against the motion, I don't know*. The voting results will be presented to the audience at the end of the debate.
- g) For more details on the moderator's role during the opening of the CON.F. debate see the Appendix 2. (Sanchez, 2014).

For	Against	Undecided
• the topic	• the topic	• I don't know

The first research-team (F.R.T.) sits on the moderator's left, while the second research-team (S.R.T.) sits on the right (see Figure 1).



**Figure 1.** The context of the ODYSSEY-Scientific Debate in CON.F.

During the CLA.F. debate the opening lasts less time as there is no presentation of the Judging Scientific Committee and the presentation of the researchers-debaters is shorter or it is omitted.

For the audience's initial vote in CLA.F. and CON.F. digital applications such as: **Mentimeter** (<https://www.mentimeter.com/inspiration#education>) or **Sli.do** (<https://www.sli.do/>) can be used by the students.

These applications facilitate the students' active involvement and provide them with the chance to vote anonymously.

In case that the use of such devices is not possible in CLA.F. and/or CON.F. for various reasons (e.g. legal limitations about the use of digital devices in school context etc.) students might simply raise their hands for the motion, against the motion or for the alternative "I don't know". In this case, a **ballot counter (or more)** is responsible for counting the votes of the audience.

Also, paper colored cards might be used (**red**: against the motion, **green**: for the motion, **white**: Undecided). The ballot counter(s) is/are responsible for collecting the votes of the audience.

### 6.3.3. First Round of the Debate: The Constructive Speeches (C.S.) (4')

The **Constructive Speeches** (C.S.) are presented in the beginning of the debate and provide both the judges and the audience with a first impression on the research-teams. The researchers-debaters:

- construct arguments for or against the examined topic (usually 2-4) based upon the intense inquiry of the research-team aiming to "build the case" (Bauschard, 2017b, <https://pf.debateus.org/?s=the+format>) or "set forth the case" (Russell Hanes, 2007) and
- use evidence for demonstrating why their position is correct and important for the Judging Scientific Committee and the society.

In CLA.F. debates the C.S. last four minutes (4'), while in CON.F. debates last four to five minutes (4'-5'). Usually, the C.S. follow a **typical structure**:

- short personalized introduction,
- first main supporting point (sub-points/if any),
- second main supporting point (sub-points/if any),
- third main supporting point (sub-points/if any),
- personalized conclusion.

During the first two rounds of the game there are two (2) C.S.: one for the A research-team and one for the B research-team.

#### 6.3.3.1. First C.S. of the A research-team and definition of the topic (4'-5')

The first C.S. has to be the most powerful speech of the debate. The first researcher-debater has to achieve the following goals:

- **to introduce the debate** in an interesting way, to get the audience's attention by using a quotation or a short story,



"Ladies and gentlemen, imagine if you will that your robot, called Jason, tells you that you have already ate enough calories for today! The bot is your intelligent life coach. Having a medical advisor with you all the time in the beginning seemed to be fun, but you somehow realize day by day that it becomes restricting. How will you react? The subject of the debate today is, *"The development of AI technologies will cause numerous social and economic problems for people in the near future"*.

"My partner and I stand (pro/con) on the resolution, resolved:..."

- **to affirm or reject the topic** by showing, for example, the advantages or disadvantages that stem from the implementation of a specific scientific policy,
- **to set the strategies of the debate** and the line of advocacy to be followed by the second constructive researcher-debater of the same team,
- **to predict probable negative arguments** against his/her thesis and to implicitly reject them during her/his speech based on her/his arguments and evidence,
- **to be aware of the weak or missing evidence** related to the thesis of her/his team in order to avoid traps that the opposition might set, based upon the inquiry that has been conducted,
- **to carefully prepare his/her speech** (even write it word-for-word) and present it wisely by giving: a) the **definition** of the topic and b) well organized and solid arguments enforced by reliable scientific evidence.

The definition of the topic is an important strategic move for the 1st C.S.

The definition sets the ground in which the further exchange of arguments will be conducted among the two research-teams. Even in Science the definition of a term isn't always an easy task. For example, the scientific community needed two years of debate for defining the term "planet" and deleting, finally, Pluto from the list of the so-called planets.

So, if the resolution of the scientific debate is "Sea transport in the Arctic Ocean should be developed", the definition or interpretation of its key-words by the first researcher-debater must be topical, that is related to the topic. Otherwise, the definition can be attacked by the next researcher-debater as "untopical" and unfair, since it won't allow the opposition team to develop its argumentation. The attack of the definition arguments (or topicality argument) includes three stages: a) a new interpretation of the topic, b) an explanation of the reason why the initial definition was unfair and c) the negative consequences of the initial definition for the second research-team.

In the case of a topicality argument, the next researcher-debater has to respond in a way that facilitates the conceptual "meeting" of the two teams and the development of the argumentation for both parts.



As regards the pre-mentioned topic:

- a **dictionary definition** about “sea transport” such as (e.g. *Any movement of goods and/or passengers using seagoing vessels on voyages which are undertaken wholly or partly at sea*),
- a **contextual definition**, made by an expert or found in a scientific journal (Russell Hanes, 2007:93) or
- a **personal interpretation** of the topic such as “... *the safe movement of goods and/or passengers using specialized vessels on voyages which are adapted to the extreme weather conditions of the Arctic Ocean*” could equally be used.

In any case the initial definition of the key-terms of the topic has to ensure “a fair division of the ground for both sides” (Hannan et al., 2012:86).

### 6.3.3.2. First C.S. of the B research-team (4' -5')

As the C.S. of ODYSSEY Scientific Debate follow general principles of Public Forum (P.F.) debate there is a probability of 50% that the B research-team might be the affirmative one.

---

In any case, it is important to remember that the researcher-debater of the B research-team has to **attack** the pre-mentioned **plan** and not the topic by **invalidating** the opposite arguments.

---

In particular, during the first C.S. the B research-team has to follow specific steps:


- The first researcher-debater has to accept or challenge the definition of the A research-team. In case of definition's challenge, he/she has to convince why the new proposed perspective is more suitable, as described previously.
- He/she has to build the case of the B research-team by following the same principles and rules as the A research-team. For example, if the A research-team showed the main reasons for which the **Small hydropower plants (SHPPs) are beneficial for the local communities**, the B research-team will present the opposite reasons that don't legalize the pre-mentioned plan.

---

It becomes obvious that the first C.S. of the B research-team depends on the plan of the A research-team. As a result this C.S. can never be totally prepared in advance, although various scenarios have to be considered by the research-team. **No refutations** occur during the constructive speeches.

---

### 6.3.4. Cross-fire between the first debaters-researchers (3')

Cross-fire is an exchange of questions and answers between the debaters-researchers one-on-one. During the first cross-fire, the first speaker poses the first question. Then, the turn of questions might vary among the two debaters-researchers. 

Both of them stand in front of the audience and the Judging Scientific Committee and face them, while they keep an eye-contact with the audience. So, the judges can compare their performance in equal terms.

The questions have:

- a. to be purposeful (*"What am I getting out of this?"*), brief, focused and simple,
- b. to clarify obscure points of ideas, arguments or evidence of the opposite research-team,
- c. to reveal the weak argumentative points of the opposite team,
- d. to establish an idea or argument before its introduction to a speech (Hannan et al., 2012:102).

The answers have to be short, substantial, honest, focused and relative to the question. During the cross-fire ethos of the debaters-researchers has to be shown as well as respect towards the opponents.

### 6.3.5. Rebuttal speeches (R.S.) of the A and B research-teams (4' -5')

The speech of the second debaters-researchers of both A and B research-teams is, mainly, a rebuttal speech (R.S.), since they have to answer to all the arguments made during the C.S line-by-line. After having actively listened to the previous C.S., the debaters-researchers have to further advance the position of their research-team by refuting the arguments of the opposite team. Their main goals are:

- to link the second speech of their research-team to the first one,
- to summarize every time the opposite argument to which they respond,
- to refute all the opponents' arguments by detecting hidden flaws in their reasoning, while informing the judges about their moves: *"Look to my opponents' contention one. I have three responses..."*,
- to present evidence that brings down the arguments of the opposite team,
- to debunk inconsistencies between statements of the opposite research-team,
- to rebuild the case of his/her team against the opposite arguments by adding more arguments or evidence for the case,
- to conclude with a summary.

**Special attention is paid during the R.S. of the second researcher-debater.** He/she has a double duty:

- a) to answer to the arguments made during the first C.S. (attack the opposite case)
- b) to answer to the arguments made during the first R.S. (defend his/her own case).

The rebuttal arguments that are presented during the second R.S. must be answered in the first summary speech (S.S.)

### 6.3.6. Cross-fire between the second researchers-debaters (3')

As in the first cross-fire, the second debaters-researchers exchange questions and answers between them one-on-one. The first speaker poses the first question. Then, the turn of questions might vary among the two debaters-researchers.

### 6.3.7. Preparation time for the Summary Rebuttal (S.R.) and Final Focus Rebuttal (F.F.R.) (2')

In both formats (CLA.F. and CON.F.) debaters-researchers have at their disposal two (2') minutes to allocate for preparing their argumentative strategies. It is purposeful that the preparation time is used exactly before the S.R. and the F.F.R.

### 6.3.8. Summary Rebuttals (S.R.) (2'-3')

This type of synoptic speech is a demanding one. In short time, the researcher-debater has to:

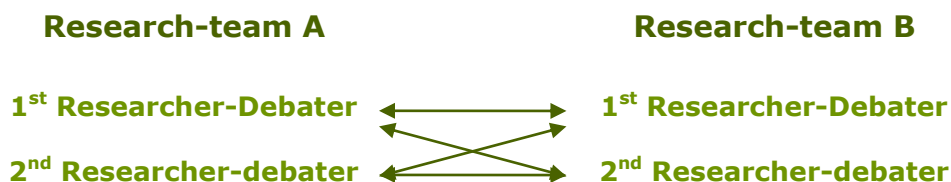
- refute counter-arguments against the case of his/her team,
- reinforce the defense of his/her case
- further the debate on the thesis of the opposite team,
- choose and extend the main arguments that support the case of his/her team by providing new evidence (new arguments are not allowed, only new evidence). Main arguments are considered the arguments that: i) produce multiple responses from both sides, ii) are connected and interact with other issues or iii) are the most clearly winning (Hannan et al., 2012:144-5)
- conclude.

---

**Attention:** The arguments that are not answered by the opposite research-team during the next speech of their research-team (**dropped arguments**) become "true" arguments for the purposes of the round.

---

### 6.3.9. Grand Crossfire (3'-4')



The Grand Crossfire is a period of exchanging questions and answers between the first four debaters-researchers of both teams which are seated. One member of the first team poses the first question. Then, the turn of questions might vary among the debaters-researchers. Dialogical ethos towards the opposite team has to be shown. During this period the third debater-researcher doesn't participate to the grand cross-fire. He/she is listening carefully to the exchange of arguments and takes notes preparing his final focus rebuttal.

### 6.3.10. Critical time for the judges and the audience (CON.F.) (12')

During this period the Judging Scientific Committee poses at least one question to each debater-researcher (1st & 2nd) of both research-teams. If time remains, the format allows the energetic participation of the audience through the posing of more questions on the 1<sup>st</sup> and 2nd researcher-debater of both research-teams (A & B). **The responses to the judges and the audience are not graded.**

### 6.3.11. Final Focus Rebuttals (F.F.R.) (2'-3')

The main goal of this speech is to persuade the audience and the Judging Scientific Committee of the winning of the one research-team and the defeat of the other ("We won because...", "Judges, you need to weigh our impacts...") (Koreschi, 2014, <https://youtu.be/MxcQbaXDFZw>). For achieving this goal the researcher-debater has to narrow down the arguments provided by his/her team in order to justify the final result. Strategies that might be used autonomous or in combination are:

- synoptic presentation and analysis or re-extension of the most sound argument of the research-team (defensive strategy),
- intense refutation of the less sound argument of the opposite research-team (offensive strategy),
- presentation of the inconsistent points of argumentation made by the opposite research-team (offensive strategy),
- comparison of the main points of both research-teams that ends up with the argumentative prominence of the debater's research-team (mixed strategy).

No new arguments are allowed in the F.F.R.

### 6.3.12. Final vote of the audience (CLA.F. and CON.F.) (3')

The audience is asked by the moderator to give its final vote on the topic, based on the debate. There are three alternatives for voting: *For the motion*, *Against the motion*, *I don't know*.

Both in CLA.F. and CON.F. formats students might complete a feedback sheet in which they write down which research-team they voted for and three reasons which support their choice relative: a) to the **matter** (quality of produced arguments), b) to the

**manner** (delivery of the speech) and c) to the **methodology** that was followed (notes can be taken during the debate) (Debaters, Association of Victoria, n.d. [http://www.dav.com.au/resources/itd\\_mmm.php](http://www.dav.com.au/resources/itd_mmm.php)) (See Appendix 3). The feedback sheets might be dropped to two ballot-boxes that are outside of the room of contest (CON.F. format) or be given directly to the debaters-researchers (CLA.F. format).

**The voting of the audience does not define the winning team in CON.F.**

### 6.3.13. Board meeting of the Judging Scientific Committee / Announcement of the audience's votes by the moderator (15')

During this period two actions occur simultaneously in CON.F. debates (all rounds, semi-finals and finals):

1. the members of the Judging Scientific Committee remain to the empty room of the contest (preliminary rounds) or leave the place of the contest (semi-final and final round) in order to decide which is the winning research-team and complete the Judges' Evaluation Sheet (See Appendix 4) and
2. the moderator announces and presents the initial and final voting of the audience (final round).

**The results of the Judging Scientific Committee** are given to a member of the Organizing Committee and **define the winning research-team of the debate.**



### 6.3.14. Announcement of the Judging Scientific Committee votes by the moderator (3')-Awards (3') (final phase of the contest)

The moderator gets the envelop with the final decision of the Judging Scientific Committee about the final winning research-team of the contest. The award is given to the first winning research-team. The semi-final research-team gets a certification in recognition of their participation to the contest.

## 6.4. ODYSSEY Scientific Debate Contest Format (CON.F.) Rules

### 6.4.1. For the participants

Each participant school to the Erasmus+ KA2 ODYSSEY project nominates ten (10) students (project team) for preparing for the CON.F. Five (5) of them (an intra-school

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debate might precede) will be chosen for participating to the CON.F. Team members can vary from round to round, if necessary. The names of the participants to each round are declared in time to the organization committee. Before the beginning of each contest round, the moderator or chief-judge reads the participants' short biographical account (see Appendix 1).

During the debate the participants may use notes, books, cards, but not digital devices.

#### 6.4.2. For the audience

The audience of each round is composed by the rest of students who don't debate. Parents and teachers don't participate to the voting process.

According to the decision of the organizing committee of the contest, all the students have to pre-install digital applications such as Sli.do or Mentimeter to the their cell-phones. Otherwise, they have to ask for the voting ballots of the audience.

During the rounds, students of one school attend the contest between students of another school.

In the semi-final round, the audience is divided in two chambers. Students of one school attend the contest between students of another school.

During the final round all the students, as audience, vote for the winning team.



During the debating rounds, the audience keeps notes about the participants' performance and completes *The Evaluation Sheet of the Audience* (both in CON.F. and CLA.F.) (see Appendix 3). Feedback is very important for the researchers-debaters!

The audience votes for the winning team according to the quality of the produced arguments (matter), the delivery of the speech (manner) and the methodology that was followed (the structure of the speech, the clarity and responding to other's arguments) (Debaters, Association of Victoria, n.d. [http://www.dav.com.au/resources/itd\\_mmm.php](http://www.dav.com.au/resources/itd_mmm.php)).

#### 6.4.3. For the Judging Scientific Committee

In real life, the evolution of Science depends on the testing and scrutiny of innovative ideas and methods within the scientific Committee. For this reason the ODYSSEY-Scientific Debate CON.F. introduces the **Judging Scientific Committee** which is composed by three members-experts in the field of Sciences (educators of Sciences, scientists, researchers) and/or debate (2:1). **Independently of the final vote of the**

**audience and the choice of the winning team that doesn't define the final result,** the role of the Judging Scientific Committee is to:

- a) vote for the best team either for confirming the choice of the audience or for problematizing about its final decision and the reasons of the disaccord,
- b) provide the researchers-debaters with objective scientific knowledge on the topic, c) spot during the Critical Time period, through their questions, scientific mistakes that might have occurred in the debaters' speeches,
- d) to ask for full written citation of used evidence in case of doubt about the validity of evidence. **Distorted evidence, non-existent evidence or omitted evidence lose the round.**

After the Grand Cross-Fire, the Judging Scientific Committee poses at least one question to the first and second researcher-debater of both research-teams. If time remains, the audience might pose more questions. The answers to the Judging Committee and the audience **are not graded.**



During each round the judges have to complete the evaluation sheet (Appendix 4).

After each round, the judges take fifteen minutes to review notes in private chambers and choose the winning team.

It is very important that each member of the Judging Scientific Committee gives written feedback to the debaters-researchers.

#### 6.4.4. For the chairman/moderator

The chairman/moderator is responsible for running the ODYSSEY-Scientific Debate (welcome the audience, present all the participants, run and present the voting process etc.). (In CLA.F. the role of the chairman might be undertaken by the teacher or a student).

#### 6.4.5. For the time-keeper

The time-keeper is responsible for keeping the time of every speech by using a time device such as a smartphone or a stopwatch. During the speeches he/she indicates the time by raising the hand and showing with the fingers every minute. He/She indicates the end of the speech by knocking twice on the table surface or by ringing a bell.



Speakers, can't exceed the time-limit of their speech more than 15 seconds. Otherwise, they lose points (methodology standard) for speaking past the allocated time.



The time-keeper has to complete the Timekeeper's sheet (Appendix 7) and submit it to the Judging Scientific Committee before their final meeting for agreeing the winning team.

(In CLA.F. the role of the time-keeper might be undertaken by a student).

#### 6.4.6. For the members of the organizing committee

The organizing committee is responsible for:

- indicating the rooms of preparation of each research-team,
- announcing the topic of the debate to the participants,
- flipping the coin for defining which research-team will be the affirmative and the negative one,
- collecting the ballots of the audience,
- collecting the ballots of the Judging Scientific Committee,
- supporting the record keeping of the scores of all the participant teams.

#### 6.4.7. For the coaches

The coaches are responsible for:

- accompanying the students to the contest debate,
- advising their students about their conduct towards the opponents, the Judging Scientific Committee and the Organizing Committee during their participation to the contest,
- motivating their students.

The coaches are not present during the preparation of the students for the debate.

### 6.5. TIPS for the ODYSSEY-Scientific Debate

- Prepare yourself for debating!
- Your research must be open and honest.
- Open and close the debate in an interesting way.
- Be positive, friendly and assertive.
- Prepare in advance your constructive speech.
- Listen carefully to the speeches of all the participants, either for expanding the arguments or refuting them.



- Create your personal style of flowing.
- Keep on flowing!
- Speak freely, concisely and courageously!!!
- Use ethos, pathos and logos to persuade your audience!
- You can always improve your style!
- The less you read your notes, the better you will perform your speech!
- Eliminate filler words such as “um” and “uh”.
- Avoid the repetition of the same arguments.
- Respect the debaters. Attack their arguments.
- Spot the fallacies used by your opponent. Attack them!
- Don’t convert your passion to aggression!
- Try to respond to all the counter-arguments.
- Cite correctly the scientific evidence that you use.
- Remember: your personal opinion is not evidence!
- Paraphrase the evidence in an accurate way.
- During the cross-fire, the time-limit for a question and an answer is approximately 30 sec. (Bauschard, 2017a).
- Keep looking at the judge, while responding to the cross-fire.
- Prepare questions in advance.
- Ask concise questions and give concise answers.
- In case that you don’t know the answer to a question, you have two choices: either to admit that you don’t know the answer or to dexterously pivot to another relative issue.



- Don't interrupt the other participants while they talk and don't permit the others interrupt you.
- Co-operate with the other members of your research-team. Debate is a team activity.
- Winning the debate is important, but the joy of participation is even more important!

### 6.6. Useful links on debate

1. How to perform well on a debate. <https://www.wikihow.com/Perform-Well-in-a-Debate>
2. Complete Guide to Debating: How to improve your debating skills. <https://virtualspeech.com/blog/guide-to-debating>
3. Video. How to take notes in debate. Flowing <https://www.youtube.com/watch?v=YY-JxA0MvOU>
4. Video. Oxford-Style Debate, explained <https://www.youtube.com/watch?v=xVmShH0-9xY>
5. Video. Public Forum Debate Structure <https://www.youtube.com/watch?v=MxcQbaXDFZw>

## PART B'

### APPENDICES

#### **Sheets and Forms for the implementation of Odyssey Scientific Debate**



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## 7.1. Appendix 1: Student’s Short Biographical Account for CON.F. Debates



### ODYSSEY-Scientific Debate

#### Student’s Short Biographical Account

**NAME:** .....

**SURNAME:** .....

**CLASS:**.....

**SCHOOL:** .....

**HOBBY:** .....

**If he/she became a scientist, he/she**

.....

.....

.....

.....

## 7.2. Appendix 2: The Opening Speech of the Moderator/Chairperson (according to the rules of WSDC format, see Sanchez, 2014)



Ladies and gentleman, welcome to the *ODYSSEY-Scientific Debate*. You are kindly requested to turn your mobile phones on silent mode. Thank you.

"I call this debate in order".

I welcome the members of our Judging Scientific Committee.

Judging this scientific debate are:

1. (Name of the judge)\_\_\_\_\_ from (School/Institution/Country)\_\_\_\_\_
2. (Name of the judge)\_\_\_\_\_ from (School/Institution/Country)\_\_\_\_\_
3. (Name of the judge)\_\_\_\_\_ from (School/Institution/Country)\_\_\_\_\_
4. (Name of the judge)\_\_\_\_\_ from (School/Institution/Country)\_\_\_\_\_
5. (Name of the judge)\_\_\_\_\_ from (School/Institution/Country)\_\_\_\_\_

Please welcome them!! (applause)

I welcome the Time Keeper.

- 1.(Name of the Time Keeper)\_\_\_\_\_ from (School) \_\_\_\_\_

Speaking time for the Constructive Speeches are 4'-5' minutes.

Speaking time for the Summary Rebuttal are 2'-3' minutes.

Speaking time for the Final Focus Rebuttal are 2'-3' minutes.

Speaking time for the Cross-Fire among the speakers are 3' minutes.

Time for the audience to pose questions to the speakers are 10' minutes.

Speaking time for the Grand Cross-Fire among the speakers are 4' minutes.

The following ring will be sounded when the time is over in every round. Double ring will be sounded after 15" seconds.

Speaking for the proposition are:

First debater-researcher (he/she reads the short biographical account),

Second debater-researcher (he/she reads the short biographical account),



Third debater-researcher (he/she reads the short biographical account).

Please welcome them!! (applause)

Speaking for the opposition are:

First debater-researcher (he/she reads the short biographical account),

Second debater-researcher (he/she reads the short biographical account),

Third debater-researcher (he/she reads the short biographical account).

The motion for this round today is: "This Scientific Committee believes that..."

Debating this round are the research-team "\_\_\_\_\_", who are proposing, as well as the research-team "\_\_\_\_\_", who are opposing.

The audience is kindly requested to give its initial vote on the topic. There are three alternatives for voting: *for the motion, against the motion, I don't know*. Thank you!

It is now my pleasure to welcome (name) \_\_\_\_\_, the first debater-researcher of the proposition to open the debate.

<After every speech>: Thank you, (name)\_\_\_\_\_, for your speech!

<Next speeches (examples)>:

I would now like to call \_\_\_\_\_ to give his/her speech.

It's now my pleasure to ask \_\_\_\_\_ to give the Summary Rebuttal Speech/Final Focus Rebuttal Speech of the proposition/opposition.

<After the last speech>:

Thank you very much for this debate! Please shake hands and await the judges' decision. Good-bye!

**7.3. Appendix 3:** The Evaluation Sheet of the Audience (CON.F. and CLA.F. debates)

**ODYSSEY-SCIENTIFIC DEBATE  
EVALUATION SHEET OF THE AUDIENCE**

**I voted for the research-team**

A	B
---	---

**(write an X):**

**The reasons that I voted for this team are:**

Reason 1.

---

Reason 2.

---

Reason 3.

---

**Suggestions for improvement:**

Suggestion 1 relative to the **matter** (quality of produced arguments):

---

---

---

Suggestion 2 relative to the **manner** (delivery of speech):

---

---

---

Suggestion 3 relative to the **methodology that was followed** (e.g. all the necessary areas of contention are presented etc.):


---

---

---

---



 <b>Criteria Assessment</b>		Arg/ve Skills: Quality of Arguments (1-10)	Arg/ve Skills: Rebuttal Arguments (1-15)	Arg/ve Skills: Quality of Scient. Evidence (1-15)	Debating Skills: Metho- dology (1-10)	Commu- nication Skills (1-10)	Linguistic Skills: Use of Lang./ Structure of Speech (1-10)	Team-Work (for all members) (1-10)	Dialogic/ Critical Skills (1-10)			Total Score
									Questions' Number N	Questions' Quality QQ	Answers Quality QA	
Speech	Names	Constructive Speeches										
Affirmative Constructive			X						Cross Fire 1 <sup>st</sup> to 1st			
									N=	/5	/5	
Negative Constructive			X						Cross Fire 1 <sup>st</sup> to 1st			
									N=	/5	/5	
Speech	Names	Rebuttal Speeches										
Affirmative Rebuttal									Cross Fire 2 <sup>nd</sup> to 2nd			
									N=	/5	/5	
Negative Rebuttal									Cross Fire 2 <sup>nd</sup> to 2nd			
									N=	/5	/5	
Speech	Names	Summary and Final Focus Rebuttal										
Affirmative Summary		X						X	X			
Affirmative Final		X	X	X					X			
Negative Summary		X						X	X			
Negative Final		X	X	X					X			
	Names	Grand Cross Fire										
1 <sup>st</sup> Affir/ve		X	X	X	X	X	X	X	N=	/5	/5	
2 <sup>nd</sup> Affir/ve		X	X	X	X	X	X	X	N=	/5	/5	
1 <sup>st</sup> Negative		X	X	X	X	X	X	X	N=	/5	/5	
2 <sup>nd</sup> Negative		X	X	X	X	X	X	X	N=	/5	/5	
Results Affirmative Team/Total Score of Speakers		Score 1 <sup>st</sup> Speaker	.....	Score 2 <sup>nd</sup> Speaker	.....	Score 3 <sup>rd</sup> Speaker	.....	Total Affirmative Score				
Results Negative Team/Total Score of Speakers		Score 1 <sup>st</sup> Speaker	.....	Score 2 <sup>nd</sup> Speaker	.....	Score 3 <sup>rd</sup> Speaker	.....	Total Negative Score				

#### 7.4. Appendix 4: Evaluation Sheet of the Judging Scientific Committee – Odyssey Scientific Debate

Office Project: Księcia Janusza 64, 01-452, Warsaw, Poland, <http://odyssey.iqf.edu.pl> [edukacja@iqf.edu.pl](mailto:edukacja@iqf.edu.pl)



Institute of Geophysics  
Polish Academy of Sciences



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OF SCIENCE



ENERGIA  
AVANCEMENT CENTER

<b>Criteria for Assessment</b> <b>1.Arg/ve Skills: Quality of Arguments: 1-10</b> Excellent:10/10      Very Good:9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10	<b>3.Quality of Scientific Evidence: 1-15</b> Excellent:15/15      Very Good:14-11/15 Good: 10-9/15      Satisfactory: 8/15 To Improve: 7-1/15	<b>5.Communication Skills:1-10</b> Excellent:10/10      Very Good:9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10	<b>7. Team-Work: 1-10</b> Excellent:10/10      Very Good: 9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10
<b>2.Arg/ve Skills: Rebuttal Arguments: 1-15</b> Excellent:15/15      Very Good:14-11/15 Good: 10-9/15      Satisfactory: 8/15 To Improve: 7-1/15	<b>4.Debating Skills: Methodology:1-10</b> Excellent:10/10      Very Good:9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10	<b>6.Linguistic Skills: Use of Language/ Structure of Speech:1-10</b> Excellent:10/10      Very Good:9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10	<b>8. Dialogic/Critical Skills: 1-20</b> 8i.Quality of Questions Posed:1-10 8ii.Quality of Answers: 1-10 points Excellent:10/10      Very Good: 9-8/10 Good: 7-6/10      Satisfactory: 5/10 To Improve: 4-1/10

### Written Feedback to the Researchers-Debaters of the Odyssey-Scientific Debate

1 <sup>st</sup> Affirmative Researcher-Debater Name:	2 <sup>nd</sup> Affirmative Reseracher-Debater Name:	3 <sup>rd</sup> Affirmative Researcher-Debater Name:
1 <sup>st</sup> Negative Researcher-Debater Name:	2 <sup>nd</sup> Negative Researcher-Debater Name:	3 <sup>rd</sup> Negative Researcher-Debater Name:

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 Institute of Geophysics  
 Polish Academy of Sciences

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## 7.5. Appendix 5: Range of Marks and Descriptive Analysis of Performance in Odyssey Scientific Debate

Criteria of Assessment	LEVELS OF PERFORMANCE				
	Exceptional (10/10) or (15/15)	Very Good (9-8/10) or (14-11/15)	Good (7-6/10) or (10-9/15)	Satisfactory (5/10) or (8/15)	To Improve (1-4/10) or (1-7/15)
<b>1. Argumentation Skills: Quality of Arguments (1-10 points)</b>	<ul style="list-style-type: none"> <li>● Use of multiple, various and sound arguments.</li> <li>● All the arguments (sign, causal, analogous etc.) give relative, acceptable and sufficient reasons for supporting the thesis.</li> <li>● All the arguments are well structured (claim, warrant, impact) and supported by reliable evidence.</li> <li>● The most important arguments for covering the contention have been used.</li> </ul>	<ul style="list-style-type: none"> <li>● Almost all the areas of contention have been covered by the most important and sound arguments.</li> <li>● All the arguments are correctly structured and accurately expressed.</li> </ul>	<ul style="list-style-type: none"> <li>● The majority of the arguments are well structured and supported by relative and acceptable reasons.</li> <li>● All the areas of contention are not yet covered.</li> </ul>	<ul style="list-style-type: none"> <li>● At least one argument is composed by claim, warrant, evidence and impact.</li> <li>● More arguments have to be equally developed.</li> <li>● More sound reasons have still to be found.</li> </ul>	<ul style="list-style-type: none"> <li>● There are claims but not sound reasons for supporting the thesis or the arguments are fallacious.</li> </ul>
<b>2. Argumentation Skills: Rebuttal Arguments and Refutations (1-15 points)</b>	<ul style="list-style-type: none"> <li>● Refutations that demonstrate strong critical thinking skills.</li> <li>● They challenge the warrant of the opposite argument showing why the reasoning behind it is incorrect or inconsistent.</li> <li>● The offensive character of the refutations is responsive and effective.</li> <li>● The refutations are full arguments with special impact.</li> </ul>	<ul style="list-style-type: none"> <li>● The challenge of all the important opposite arguments becomes more organized.</li> <li>● The rebuttal arguments acquire an offensive character that empowers the thesis of the speaker invalidating the opposite thesis.</li> <li>● Strong reasons and evidence support the refutations.</li> </ul>	<ul style="list-style-type: none"> <li>● The rebuttal arguments tend to refute groups of major opposite arguments.</li> <li>● They are supported by reasons and evidence.</li> <li>● The rebuttal arguments are of defensive character.</li> <li>● They mainly challenge the claim, the impact and the</li> </ul>	<ul style="list-style-type: none"> <li>● At least one opposite argument is challenged.</li> <li>● The rebuttal argument is relative to the opposite argument and explained by reasons and evidence.</li> </ul>	<ul style="list-style-type: none"> <li>● No use of rebuttal arguments.</li> </ul>







<b>3. Quality of Scientific Evidence (1-15 points)</b>	<ul style="list-style-type: none"> <li>● The scientific evidence is of high quality and credibility.</li> <li>● It stems from original, credible scientific sources and it is updated.</li> <li>● The evidence is relative to the claim of the argument and it includes an internal warrant even in the case of rebuttals.</li> <li>● The evidence is result of intense inquiry and it is correctly cited.</li> <li>● The use of evidence is balanced and doesn't overwhelm the debating process.</li> </ul>	<ul style="list-style-type: none"> <li>● The use of scientific evidence is a result of intense inquiry and knowledge of the topic.</li> <li>● It is always systematically organized and correctly cited and presented.</li> <li>● It is interesting and relative to the argument stated.</li> <li>● Its presentation doesn't rise problems to the opposite team and the judges.</li> </ul>	<ul style="list-style-type: none"> <li>● The scientific evidence is mostly used and correctly cited.</li> <li>● It is reliable and relative to the arguments.</li> <li>● Clear distinction between the debater's analysis and the quotation occurs.</li> </ul>	<ul style="list-style-type: none"> <li>● Scientific evidence is used for supporting at least one of the arguments.</li> <li>● Proper oral citations of the evidence.</li> <li>● It is indicated what is read.</li> <li>● Unnecessary or redundant information is still given.</li> <li>● More analysis of data is needed.</li> <li>● More research on reliable sources might be done.</li> </ul>	<ul style="list-style-type: none"> <li>● No use of scientific evidence.</li> <li>● or Use of not valid scientific evidence.</li> <li>● or Use of ellipses in evidence read (zero points).</li> <li>● Distorted evidence (the round is lost).</li> <li>● Clipping the evidence (zero points)</li> </ul>
<b>4. Debating Skills: Methodology (1-10 points)</b>	<ul style="list-style-type: none"> <li>● The quality level of the debate is high and professional.</li> <li>● All the indicated methods, principles, rules and techniques for debating are precisely followed in every round by the participants as a whole.</li> <li>● The limitations of time are respected.</li> </ul>	<ul style="list-style-type: none"> <li>● All the participants are acquainted with the rules, principles, techniques and methods of the debating process.</li> <li>● The flow of the debate is natural and pleasant.</li> <li>● The limitations of time are respected.</li> </ul>	<ul style="list-style-type: none"> <li>● Respect of the time and methods during the debate.</li> <li>● Minor omissions or mistakes occur.</li> <li>● The limitations of time are respected.</li> </ul>	<ul style="list-style-type: none"> <li>● Respect of the basic principles of debating.</li> <li>● Omissions of methods or mistakes in techniques occur.</li> <li>● The limitations of time are not completely respected.</li> </ul>	<ul style="list-style-type: none"> <li>● No respect of time limitations.</li> <li>● Violations of basic rules and deontology occur.</li> </ul>
<b>5. Communication Skills (1-10 points)</b>	<ul style="list-style-type: none"> <li>● Outstanding delivery of speech.</li> <li>● Confident, persuasive, authentic and dynamic posture.</li> <li>● Moderate gestures.</li> <li>● Assertive voice variety (pitch, volume, speed etc.).</li> <li>● Good eye-contact with the audience and the judges.</li> </ul>	<ul style="list-style-type: none"> <li>● Mostly successful delivery of the intended message due to the effective use of body language (facial expressions, gestures, eye-contact), vocal variety (pitch, volume, speed etc.).</li> <li>● Use of humor and friendly</li> </ul>	<ul style="list-style-type: none"> <li>● Significant attempts by the speaker to enrich his/her performance with enthusiasm, facial expressions, gestures etc.</li> </ul>	<ul style="list-style-type: none"> <li>● The message is delivered by the researcher-debater in a flat way.</li> </ul>	<ul style="list-style-type: none"> <li>● Poor and non-persuasive performance, distracting mannerisms, hesitations, no eye contact.</li> <li>● Difficulty of the</li> </ul>

	<ul style="list-style-type: none"> <li>●Use of moderate humor.</li> <li>●Performance of good will and ethos.</li> <li>●Friendly and professional attitude towards all the participants.</li> </ul>	attitude towards the participants.			audience to receive the intended messages.
<b>6. Linguistic Skills: Use of Language/ Structure of Speech (1-10 points)</b>	<ul style="list-style-type: none"> <li>●The language is persuasive, rich, intelligible to the audience and free of jargon and clichés.</li> <li>●The unfamiliar terms are defined and clarified.</li> <li>●Correct terms express special meanings.</li> <li>●Connectives, transition phrases and overviews of arguments assure the cohesion and coherence of the text.</li> <li>●The introduction is original and interesting.</li> <li>●The conclusion is logical.</li> <li>●The speaker adopts a personal style of debating.</li> </ul>	<ul style="list-style-type: none"> <li>●No grammar and syntax errors occur.</li> <li>● Impressive or trivial words are avoided.</li> <li>●The language used is natural, comprehensible and pleasant.</li> <li>●The use of the vocabulary is concise.</li> <li>●No pleonasms occur.</li> <li>● The parts of the speech are appropriately connected in order to ensure the effective structure of the speech.</li> </ul>	<ul style="list-style-type: none"> <li>●The use of language is characterized by a natural flow and becomes easily perceived.</li> <li>●The use of vocabulary is concise and the meanings are clear.</li> <li>●Rare grammar and syntax errors occur.</li> <li>●Connective devices link the main arguments to one another.</li> <li>●The speech is structured: short introduction, main body of the position and a short conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>●The vocabulary used is trivial or vague.</li> <li>●Use of clichés is noticed.</li> <li>●The meanings are mostly comprehensible.</li> <li>●Structural parts of the speech are lacking: e.g. introduction, conclusion etc.</li> <li>●No particular style of the speaker is noticed.</li> </ul>	<ul style="list-style-type: none"> <li>●Lot of errors in the use of language and in syntax.</li> <li>●Poor vocabulary.</li> <li>●The language is not comprehensible.</li> <li>●Absence of clear meanings.</li> <li>●There is no structure in the speech.</li> </ul>
<b>7. Team-Work (10 points) (common for all R-D)</b>	<ul style="list-style-type: none"> <li>●Continuous and successful co-operation among the teammates.</li> <li>●Successful delegation of tasks and arguments during the debating process.</li> </ul>	<ul style="list-style-type: none"> <li>●Effective co-operation among the teammates.</li> </ul>	<ul style="list-style-type: none"> <li>●Important attempts of the teammates to establish an effective co-operation among them.</li> </ul>	<ul style="list-style-type: none"> <li>●Signs of co-operation among the teammates only when it is necessary.</li> </ul>	<ul style="list-style-type: none"> <li>●No co-operation among the members of the research-team.</li> </ul>

**8. Dialogic/Critical Skills (1-20 points: 10 points for 8i and 10 points for 8ii)**

<b>8i. Quality of questions posed (1-10 points)</b>	<ul style="list-style-type: none"> <li>●All questions are effective: they ask for explanation or clarifications of ideas, they probe for weaknesses in important arguments or ask for sources citation.</li> <li>●The questions are expressed in a brief, focused and concise way.</li> <li>●The questions are not addressed to the person but to the topic.</li> </ul>	<ul style="list-style-type: none"> <li>●The majority of questions are mostly effective and correctly expressed.</li> <li>●They aim at revealing weak points of the prior speech or to clarify ideas.</li> </ul>	<ul style="list-style-type: none"> <li>●The questions posed are relative to the prior speech but they don't necessarily focus to the most important arguments or pieces of evidence.</li> </ul>	<ul style="list-style-type: none"> <li>●At least one question relative to the prior speech is posed, but it is not concise.</li> </ul>	<ul style="list-style-type: none"> <li>●No question is posed or the question consists of a statement.</li> </ul>
<b>8ii. Quality of answers (1-10 points)</b>	<ul style="list-style-type: none"> <li>●All answers are effective: brief, focused, honest, relative to the questions.</li> <li>●They insert new arguments for the thesis or rebuttals against the opposite team.</li> </ul>	<ul style="list-style-type: none"> <li>●The majority of answers are mostly to the point and correctly expressed.</li> </ul>	<ul style="list-style-type: none"> <li>●More than one answer are given but they don't add significant value to the defense of the thesis or the offense of the opposite thesis.</li> <li>●They repeat ideas already present in the speeches.</li> </ul>	<ul style="list-style-type: none"> <li>●At least one vague answer is given.</li> </ul>	<ul style="list-style-type: none"> <li>●No answers are given.</li> </ul>

## 7.6. APPENDIX 6. Odyssey Scientific Debate Ballot (completed by the chief-judge)

     										Odyssey Scientific Debate Ballot				
Resolution:														
Date:					Round:									
Affirmative Research-Team School:					Negative Research-Team School:									
Debaters-Researchers	First Researcher-Debater	Second Researcher-Debater	Third Researcher-Debater	Total Score of the Research-Team	Debaters-Researchers	First Researcher-Debater	Second Researcher-Debater	Third Researcher-Debater	Total Score of the Research-Team					
Judges					Judges									
1 <sup>st</sup> Judge Total Score					1 <sup>st</sup> Judge Total Score									
2 <sup>nd</sup> Judge Total Score					2 <sup>nd</sup> Judge Total Score									
3 <sup>rd</sup> Judge Total Score					3 <sup>rd</sup> Judge Total Score									
Total Score of Researchers-Debaters					Total Score of Researchers-Debaters									
Winning Team:					Best Speaker of both teams									
Level of Performance (for one judge)	Excellent 285-262 points	Very Good 261-223 points	Good 222-171 points	Satisfactory 170-145 points	To Improve Less than 144 points	Signatures								
(for all the 3 judges)	855-786	785-669	668-513	512-435	Less than 434	1 <sup>st</sup> Judge	2 <sup>nd</sup> Judge	The Chief Judge						

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## 7.7. Appendix 7: Timekeeper's Sheet



Erasmus+



Oxford Debates for Youths in Science Education

### ODYSSEY-SCIENTIFIC DEBATE Timekeeper's Sheet

<b>Round:</b>	<b>Topic:</b>	
<b>Speech</b>	<b>Affirmative Research-Team Name:.....</b>	<b>Negative Research-Team Name: .....</b>
	Duration	Duration
<b>Constructive Speech</b>		
<b>1<sup>st</sup> Cross-Fire</b>	Question: Reply:	Question: Reply:
<b>Rebuttal Speech</b>		
<b>2<sup>nd</sup> Cross-Fire</b>	Question: Reply:	Question: Reply:
<b>Summary Rebuttal</b>		
<b>Grand Cross-Fire</b>	Question: Reply:	Question: Reply:
<b>Final Focus Rebuttal</b>		

Signature

The Time-Keeper



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