

# GALILEO AND VESPUCCI.

IN SEARCH OF NEW SKIES  
AND NEW LANDS FOR  
GREAT OPPORTUNITIES



# Preface

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**Project:** VAST: Values Across Space & Time

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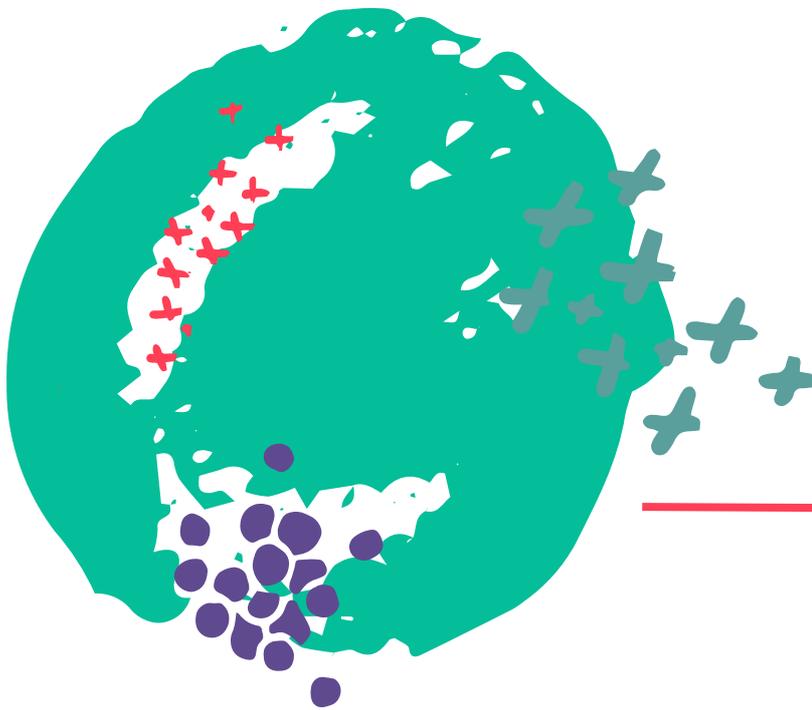
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**overview**

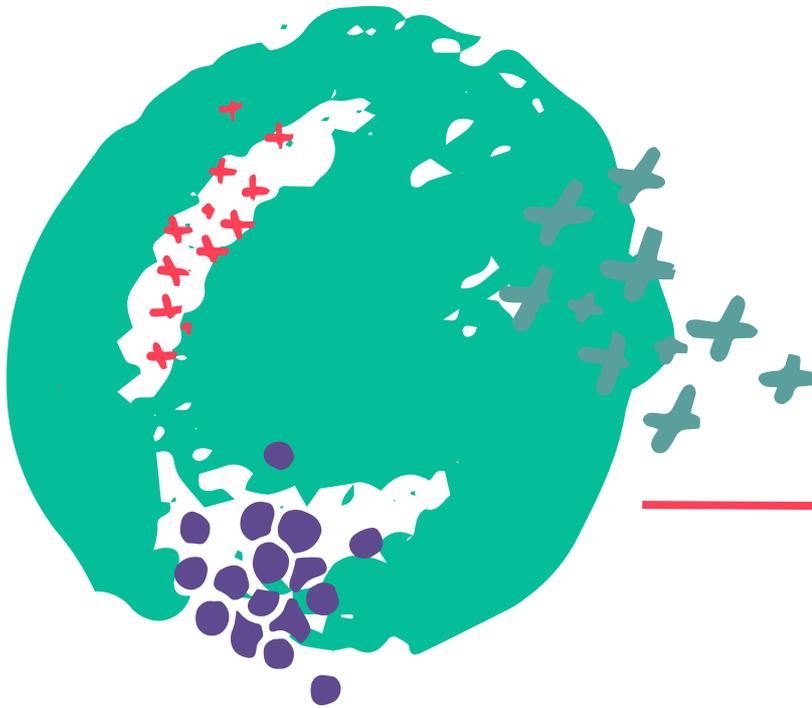
The H2020 European research project VAST- Values Across Space & Time is a collaboration among the National Center for Scientific Research 'Demokritos' (Greece), National and Kapodistrian University of Athens (Greece), the Athens & Epidaurus Festival (Greece), Università degli Studi di Milano (Italy), Fairytale Museum (Cyprus), Museo Galileo (Italy), Universidade NOVA de Lisboa – NOVA (Portugal) and Semantika (Slovenia).

The project envisions to study the dissemination of the European values (such as freedom, democracy, equality, tolerance, dialogue, human dignity, the rule of law) in space and time through the use of digitised materials and intangible cultural artefacts as well as to explore the communication, reception and perception of these values in the modern era. For the purposes of this research, three pilots have been described concerning: 1. the theatre/ancient drama, 2. the scientific texts of the 17th century, 3. the fairy tales.

A digital platform has been developed, as part of the project, with open access to citizens. In this platform, values-related scientific and educational materials and research evidence/results will be posted, as well as various tools for scientific and research study.

Do not miss visiting!

In this original theatrical play we follow two characters, Galileo Galilei and Amerigo Vespucci, talking about how they went beyond the boundaries between different worlds, cultures and tradition, following an anti-dogmatic approach.



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**activity**

# Institution

Museo Galileo (Institute and Museum of the History of Science)



## Audience

14 to 99 years old

## Title

Galileo and Vespucci. In search of New Skies and New Lands for Great Opportunities.

## Description

This original play tells the story of the imaginary encounter between two famous historical figures, Galileo and Vespucci, who come together to discuss their groundbreaking discoveries that forever changed the perception of the known world, drawing parallels between the new celestial realms unveiled by the scientist and the uncharted lands explored by the navigator. Amidst hilarious banter and astonishing tales, the audience will experience the wonder of imagined and realized landscapes, thanks to advancements in astronomical and geographical knowledge, as well as the techniques for creating scientific instruments. Throughout the play, the two protagonists explore the challenges they faced in questioning traditions and pushing forward scientific inquiry.

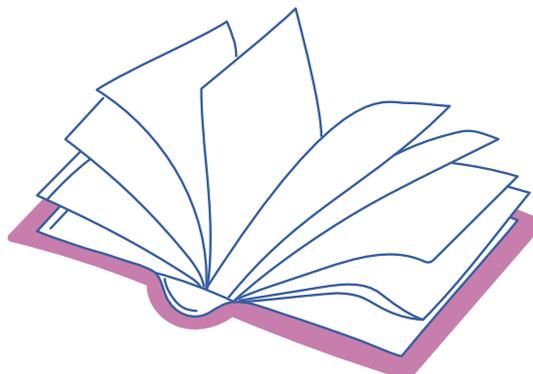


# Educational Objectives



Through this activity the participants are expected to:

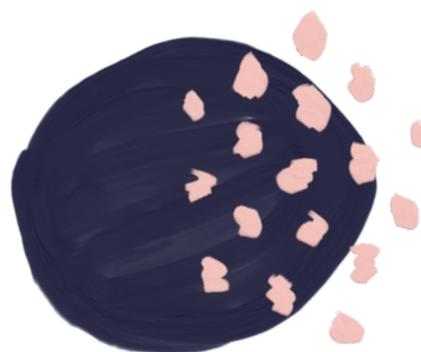
- 1 come into contact with two fascinating historical figures, Galileo and Vespucci, delving into the discoveries of new worlds and the challenges they posed to traditional beliefs
- 2 understand the significance of scientific inquiry and exploration in shaping our understanding of the world and pushing the boundaries of knowledge
- 3 learn about historical and scientific concepts related to the discoveries made during the Age of Exploration, including the advancements in navigation tools, the encounter with diverse cultures, and the exchange of goods and ideas
- 4 exercise their critical thinking about the impact of challenging preconceptions, the value of curiosity-driven exploration, and the importance of sharing knowledge for the betterment of society
- 5 understand concepts of the past and their relevance to the present, such as the struggle against dogma and the pursuit of truth, the collaborative nature of scientific progress, the ethical considerations in encounters with different cultures, and the significance of human dignity in the face of exploration and discovery



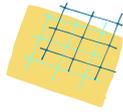
# Expected outcomes

After completing the activity, the participants:

- 1 will have understood the significance of challenging traditional beliefs and the impact it can have on scientific and societal progress
- 2 will have an overview of the historical context of the Age of Exploration, including the key explorers, their discoveries, the instruments they used and the implications of their findings
- 3 will have understood the importance of curiosity, critical thinking, and the pursuit of knowledge in driving scientific advancements and expanding our understanding of the world
- 4 will have constructed a deeper appreciation for the values associated with scientific inquiry, such as truth-seeking, cooperation, experimentation, and the sharing of knowledge
- 5 have worked together to argue and engage in thoughtful discussions about the ethical considerations involved in exploration, cultural encounters, and the responsible use of scientific advancements
- 6 will have realized that progress and innovation often require questioning established norms, embracing curiosity, and fostering an environment that values diverse perspectives and open-mindedness



# Structure



Duration

60'

Educational materials/tools

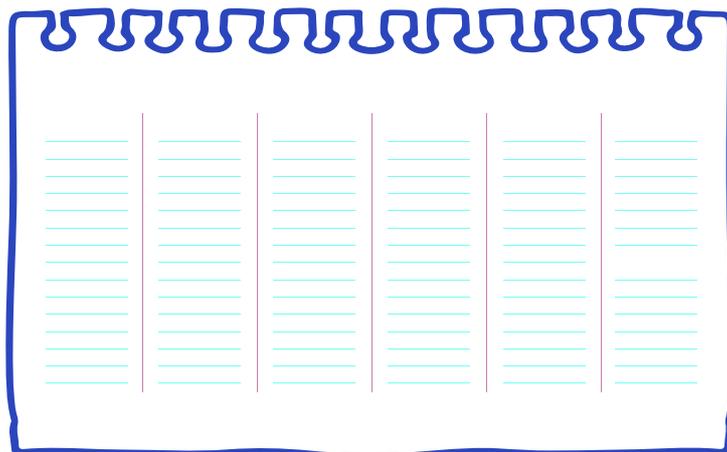
- **Stage costumes to identify the two characters**
- **Replicas of the scientific instruments discussed**
- **One current object with a retro taste as a 'plot twist'**
- **Paper questionnaires & pens**

Educator/facilitator

**1 educator/facilitator and 2 actors**

Target group

**High School Students/ General public**



## Modules/sections (design)

<b>Welcome</b>	Duration: 10'
	Materials/tools: -
	Described in pages: 11-12
<b>1st part of the activity</b>	Duration: 5'
	Materials/tools: -
	Described in pages: 13
<b>2nd part of the activity</b>	Duration: 15'
	Materials/tools: Replicas of the scientific instruments
	Described in pages: 14-16
<b>3rd part of the activity</b>	Duration: 15'
	Materials/tools: Replicas of the scientific instruments
	Described in pages: 17-18

**4th part of the activity**

Duration: 15'

Materials/tools: Paper questionnaires & pens

Described in pages: 19

**Farewell - Activity evaluation**

Described in pages: 20

## A. Introduction

Welcome to the participants & information about the activity.



### Discussion

The educator/facilitator highlights how certain values were encoded differently in the past compared to their current perception. To analyze these values from the perspective of the 17th century, the period under examination in this original pièce, texts and images from that period were annotated. The discussion was structured around the central theme of travel, which carries both real and imaginary connotations. Milan Kundera's aphorism beautifully captures this sentiment, stating that "there is nothing more beautiful than the moment that precedes a journey, the moment when the horizon of tomorrow comes to visit us and tell us its promises." Travel represents an opportunity to challenge established ideas, explore new territories, and broaden our horizons. To discuss this topic, two exceptional figures have been chosen: Galileo Galilei and Amerigo Vespucci. Despite their significant chronological distance, both were instrumental in making remarkable discoveries.

Vespucci, a cartographer, navigator, and explorer, had the intuition to trace routes and arrive in lands that Columbus believed were part of Asia, only to realize that he was in the fourth part of the world. He wrote beautiful letters, of which some extracts are used: in a letter to Lorenzo de' Medici in 1497, Vespucci expresses his amazement at having recognized a new land, "I arrived at the land of the Antipodes, and recognized that I was in the presence of the fourth part of the Earth. I discovered a continent inhabited by a multitude of peoples and animals, more than our Europe, Asia or even Africa".

In another quotation from *Mundus Novus* (a letter sent by Vespucci to Lorenzo di Pierfrancesco de' Medici on his voyage of 1501-2), similarities with Galileo can be noted. Vespucci writes, "In recent days, I have written to you at some length about my return from those new lands that, with the fleet, finances, and mandate of the Most Serene King of Portugal, we sought and discovered and that we appropriately called the New World. Our ancestors had no knowledge of these lands, and for all those who hear it, this [news] is something completely new".

Similarly, Galileo in the *Sidereus Nuncius* says: "Truly great are the things that I propose to the view and contemplation of the students of nature in this brief treatise. Great, I say, both for the excellency of the matter itself, and for their novelty, never heard of in all past times, and also for the instrument, by virtue of which those same things have been made manifest to our senses."

These statements suggest that both Galileo and Vespucci were both aware of the importance and novelty represented by their discoveries. Therefore we had fun imagining what they would have said if they could have met. It is an impossible conversation in which we allowed ourselves some poetic license without ever distorting their thoughts or the importance of their discoveries.

*Note/Tip for the educator/facilitator: A small theatrical piece like the one proposed, entirely written by the museum staff, is usually well-received by the public, who see these initiatives as an enrichment and diversification of the educational offer. For the staging, therefore, even a few touches may be sufficient: a welcoming setting, stage costumes that clearly identify the characters, replicas of the presented instruments. The success of the operation depends entirely on the actors' ability to captivate the audience.*

## 1st part of the activity: *Galileo and Vespucci meet*

- In this first scene, the participants becomes aware, thanks to a quick exchange of lines, of the fundamental data of the two characters.



### **Discussion**

Galileo explains that he is a mathematician and philosopher at the court of the Medici Grand Dukes of Tuscany. He states that he taught in the past but is no longer obliged to do so, and it is understood that he is now working on perfecting the lenses for his telescope that all the rulers of Europe want to try.

Vespucci, on the other hand, mentioning the expulsion of the Medici from Florence, makes it clear that he lived a century before Galileo. He presents himself as a merchant, entrepreneur, cartographer, adventurer, and navigator. He explains that he did not give the name to America, but it was two Germans, Martin Waldseemüller and Mathias Ringmann, who attributed that name in his honor. And he says that now he has the task of preparing future expeditions to the new continent and training the crew in the use of scientific instruments.

*Note: This first scene serves to introduce the two characters in a light way and the essential data to place them chronologically.*

## 2nd part of the activity: *The scientific instruments used by Vespucci and Galileo*

- In this part, the participants will become familiar with some of the instruments used by Galileo and Vespucci in their discoveries, instruments that are part of the museum collections.



**The Log**

The first instrument shown is the log, which is used to measure the estimated speed of a ship by tracing a line on the surface of the sea. It is explained that the method is approximate because, at the time, there were no precise instruments to measure time on a ship. Galileo explains that mechanical clocks are not reliable at sea due to variations caused by heat, cold, and saltwater. Vespucci then mentions the use of hourglasses (which were loaded in large quantities due to their fragility) as an alternative and asks for Galileo's help.

The actors then encourage the audience to participate in the explanation of its functioning and organize volunteers who must count the knots that pass by as a rope is unwound. Starting the experiment, Galileo mentions the fragility of hourglasses and Vespucci suggests the use of a song as an alternative to mark time in equal parts. Galileo offers to accompany with the lute, considering that his father was a lutenist, but Vespucci decides to do it all acapella. Vespucci instructs the audience on their responsibilities in the experiment and Galileo mentions his law on the isochronism of the pendulum. However, Vespucci interrupts him and invites the audience to sing a sea song. Later, Vespucci organizes the audience and rewinds the log.

*Note/discussion: The active participation of the participants in marking time and later in singing a popular song by Franco Battiato (Summer on a Solitary Beach) that talks about the sea serves to fix in memory the fundamental principles of the instrument, the difficulties in measuring time during ancient sea crossings, while amusing at the same time. After the first moments of embarrassment, the audience always responds with participation and enthusiasm. This multisensory experience (which combines tactile and auditory stimuli) has proved very effective when the performance was presented to a blind audience and their companions. The explanation of some of the objects used in the past serves to highlight the importance of scientific knowledge and education as essential tools for the progress of humanity.*



## The astrolabe and the compass

Vespucci explains the ancient origins of the astrolabe and its importance in calculating, through the height of the sun or a star on the horizon, the latitude of a place, essential for orienting oneself in unknown lands and seas. Galileo adds that he also used the astrolabe to draw the map of the sky and make astrological predictions for payment. Vespucci jokes by asking if Galileo had always been right in his predictions, while Galileo does the same for Vespucci's routes. This is the pretext for introducing the importance of the compass for travelers, capable of determining their direction quickly and accurately, regardless of the weather conditions, thanks to the constant reference to the North Pole.

*Note/discussion: In this part, the various systems designed to solve the problem of calculating latitude, and later longitude, are introduced, as well as the importance of innovation and technology for the discovery of new worlds.*





## The cross-staff and the celatone

The explanation of the cross-staff, and its use for measuring distances, turns into a fun "duel" with cross-staff shots, which serves to introduce the helmet-shaped instrument known as celatone (from celata, a type of helmet called a "sallet" in English), invented by Galileo to observe, with a telescope from the deck of a constantly moving ship, the satellites of Jupiter and to determine the longitude with the help of comparison tables.

*Note/discussion: Underlying this dialogue is the importance of scientific investigation and precision in measurement and data collection*



## The telescope

Finally, Galileo presents his revolutionary instrument to Vespucci: the telescope. He points out how he has oriented it towards the sky (when at the time it was little more than a toy used for terrestrial observations), making the revolutionary discoveries that would forever change our perception of the world.

*Note/discussion: The groundbreaking importance of the instrument for the advancement of human knowledge and the wonder that the new discoveries must have aroused at the time are masterfully hinted at in Galileo's lines and in Vespucci's amazement and enthusiasm towards an instrument that had not yet been invented in his time.*

### 3rd part of the activity: *Revolutionary geographic and astronomical discoveries*

- In this part, the participant will have an overview of the discoveries made by the two characters, to reflect on the challenges they faced, the open-mindedness of the two protagonists, and their ability to see beyond what was common belief.



#### **Vespucci's discoveries**

The part dedicated to the discovery of the New World paraphrases the contents of the letters written by Vespucci himself, describing landscapes with impenetrable forests and fertile lands, flora and fauna never seen before. It talks about crops such as potatoes and maize that were later introduced to Europe to combat famine. But also about beautiful animals (parrots) and "monstrous" creatures such as a serpent eight arms long and a wingless dragon. It also reports Vespucci's descriptions of the inhabitants of those lands, their strange customs, such as going naked, adorning themselves with parrot feathers, and eating their enemies. But also of their living in communion with nature, without knowing the concept of property and profit. It focuses on the differences in healing methods and reflects on how Europeans, with their beards and armor, must have seemed like alien creatures to the inhabitants of the discovered lands. Finally, it concludes that without the adventures and dangers faced during the voyages, they would never have known these new civilizations.

*Note/discussion: The discussion, while reflecting on important themes such as tolerance, the importance of open-mindedness for the expansion of knowledge, the need for the absence of prejudices, human dignity, and courage in facing new challenges, is approached with a light tone, also using popular quotes from modern movies.*



## Galileo's discoveries

Galileo replies that the telescope represents his ship, and through it, he discovered new continents such as the Moon, the phases of Venus, the satellites of Jupiter, sunspots, and the Milky Way. Vespucci is surprised by the new discoveries, and Galileo explains that for traveling, it is necessary to have the courage to question oneself, as everything that was considered true in the past can turn out to be false.

*Note/discussion: The story of Galileo and his discoveries, which led to a revolution in the way the world was conceived, subverting the cosmological model that had been dominant for centuries and accepted by the ecclesiastical authorities, addresses concepts such as challenging traditions/authorities, the value of scientific investigation, self-determination in choosing one's goals and principles, and experimentation for the improvement of knowledge.*



## 4th part of the activity: *Questionnaires*

- At the end of the performance, the participants are invited to fill out a questionnaire (Appendix).



### **Activity**

The questionnaire serves to collect, anonymously, the following types of data:

- Perception of the values emerged during the performance
- Understanding of concepts associated with certain values addressed during the performance
- Questions about the themes of social responsibility of science and technology, the importance of dialogue and sharing in research, transparency, and public participation in science
- Satisfaction with the experience
- Perception of the role of a museum in the dialogue regarding the transformation of values throughout different periods

*Note: Although personal, the questionnaires lend themselves to a comparison among participants. In some cases, due to the complexity of some of the themes addressed, it has been useful to propose some points for reflection and stimulate dialogue among the viewers.*

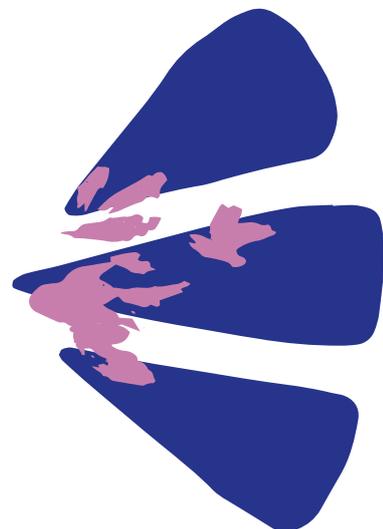
## Farewell - Activity evaluation

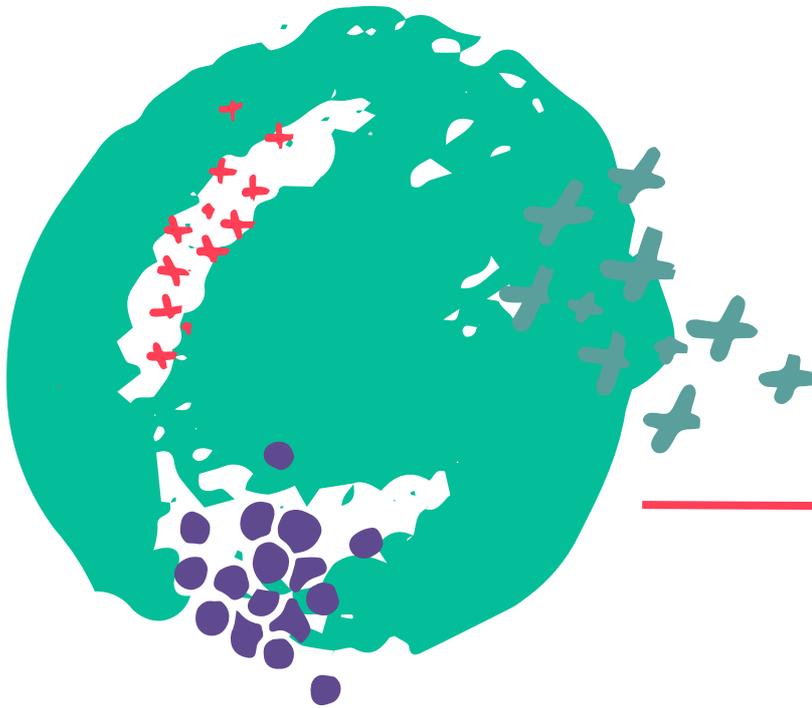


We summarize the most important points and thank visitors for the participation.



For blind and partially sighted participants, at the end we offer a tactile experience that includes exploring instrument replicas, scene costumes, and tactile representations of scientific concepts.





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**sources**

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- Galilei G. (1632), *Dialogo sopra i due massimi sistemi del mondo*, in Galilei G., *Opere*, ed. nazionale a cura di A. Favaro (1890-1909), ristampa Firenze: G. Barbèra, 1929-1939, vol. VII, pp. 43-542
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- Galilei G. (1610), *Sidereus Nuncius*, in Galilei G., *Opere*, ed. nazionale a cura di A. Favaro (1890-1909), ristampa Firenze: G. Barbèra, 1929-1939, vol. III.1, pp. 95-140

# APPENDIX

## ***Post-Theatrical Performance Audience Survey***

Dear visitor,

Thank you for taking the time to complete this survey. It will only take a few minutes, and your responses will help us better understand your experience related to the activity you attended. The survey is anonymous, and your participation is voluntary. The survey results will be evaluated and used for research purposes, and to improve the educational offerings of the Museum. If you have any questions regarding the survey, please contact us.

We truly appreciate your contribution!

### **Section 1 – Personal Information**

1. Age

- < 21
- 21-30
- 31-40
- 41-50
- 51-60
- > 60

2. Gender

- M
- F
- Other
- I prefer not to answer

3. Where do you live?

- Large City/Capital (>100.000)
- Suburb near a large city
- Small City (<100.000)
- Town or Rural Area (<30.000)

4. Educational qualification

- Certificate of Completion of the First Cycle of Education
- High School Diploma
- Bachelor's Degree
- Master's Degree
- Ph.D.
- Other .....

## Section 2 - Museum Experience

5. Is this your first time visiting our Museum?

- Yes
- No

6. Have you ever attended a theatrical performance designed to stimulate reflection on social or moral values?

- Yes
- No

If yes, which one .....

.....

7. In your opinion, which themes emerged during the performance? (up to 3 choices)

- Challenging traditions
- The value of scientific inquiry
- The importance of knowledge sharing
- Drive for innovation
- Expansion of scientific knowledge
- Curiosity as a driving force for exploration
- Technological progress

8. Do you think any of these values emerged from the performance? (up to 3 choices)

- The pursuit of truth
- Self-determination (in setting one's own goals and principles)
- Cooperation
- Experimentation
- Knowledge
- Tolerance
- Human dignity

9. Among the values mentioned above, which ones did you perceive to be associated with the character of Galileo Galilei in the theatrical performance?

.....

.....

Which ones with the character of Amerigo Vespucci?

.....

.....

10. Did the performance in any way alter your understanding of the characters?

- Yes
- No

If you wish, please explain how .....

.....

.....

11. Did the performance evoke any emotions in you, and if so, which ones?

.....

.....

12. Did you expect that a theatrical performance centered around Galileo and Vespucci could provoke reflection on ethical and moral values?

- Yes
- No
- I had no expectations

If you wish, please leave a comment .....

.....

.....

13. Do you think the activity conveyed a connection between the scientific instruments displayed and the expressed values?

- Yes
- No

Other .....

.....

14. What terms or concepts would you associate with the word 'truth'?

.....

.....

15. Can you describe, in a few words, the effects (positive or negative) that you see in technological progress?

.....

.....

16. What comes to mind when discussing 'cooperation' within the scientific community?

.....  
.....

17. Considering recent news and discussions about the role of scientific and technological research, can you rate the following questions?

	Not at all	Slightly	Moderately	Very	Extremely
Do scientists and researchers have a responsibility to anticipate and manage the social effects of their discoveries?					
How important is dialogue and sharing in research?					
How important is the role of transparency and public participation in science and technology?					
Can science and technology have the ability to solve societal problems?					
Can science and technology be promoters of social equality?					

Would you like to leave a comment regarding any of these observations?

.....  
.....

18. What did you like the most?

.....  
.....

19. Do you believe that a museum as a cultural institution can be a place for gatherings, where discussions on the transformation of values in different eras can also take place?

- Yes
- No
- Other .....



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