

Galileo and the Celestial Phenomena

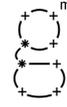
Post-visit
Activity proposals



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Galileo and the Celestial Phenomena: Post-Visit



museo
galileo

Istituto e Museo
di Storia della Scienza

Introduction

This document, aimed at teachers, is an integral part of the post-visit phase of the educational pathway "*Galileo and the Celestial Phenomena*".

Purpose of the document

The aim is to provide some basic ideas from which to start elaborating activities to be carried out in the classroom or at home, in order to implement the acquired knowledge. The document also indicates complementary paths to the visit developed by other European institutes participating in the project as a stimulus to proceed to an autonomous study of the proposed themes.

Mode

The illustrated activities are designed to be carried out in small groups. Each group should be assigned a task on a specific topic within a unitary theme. The best works will be published on the Museo Galileo website.

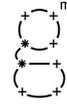
Purpose

The aim of the activity is to encourage students to learn, through direct experience, complex theoretical concepts, while promoting the importance of different points of view, the spirit of collaboration, inclusion, the multiplicity of styles and the error evaluation.

Delivery of the material

The documents can be sent via the [WeTransfer](#) web application to the address didattica@museogalileo.it.

The images should be sharp and have a minimum resolution of 1000x1000. The videos must have a maximum duration of about 2 minutes.



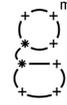
Proposals for activities

Middle schools (age 11-13)

1. Short quiz to check students' acquisition of some concepts

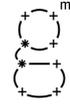
1. Record short videos imagining interviewing scientists who lived in different eras in order to have them explain astronomical theories or discoveries of the time. Prepare a canvas with questions in advance.

2. Starting from what you have learned in all phases of the activity, try, possibly in collaboration with the technical education teacher, to reconstruct models or replicas of astronomical instruments, documenting work phases and results
 - a. Group 1: pre-telescopic observations. Reconstruction of replicas of ancient instruments based on downloadable instructions (e.g. nocturnal).
 - b. Group 2: the Galilean revolution. With the help of downloadable instructions, creation of a camera obscura to understand the principle by which Galileo observed the sun.
 - c. Group 3: construction of a timeline (on physical media if intended to furnish the classroom or in digital format) on which to place some of the most important astronomical discoveries illustrated through models/drawings and short writings.
 - d. Group 4: discoveries of the modern era. Creation of a scale model of the Solar System. Use corridors and the garden of the school to place the Sun and the first planets (Note: already with a Mercury of 5 mm, on a scale of 1:1,000,000,000 to respect the proportions Neptune will be about 4.5 km away!)
 - e.



Scuola secondaria di secondo grado

1. Short quiz to check students' acquisition of some concepts
2. Short essay on some topics addressed during the activity. E.g.:
 - a. Group 1: pre-telescopic observations. Illustrate and describe the geocentric system and try to explain why it remained the predominant theory until the beginning of the modern era.
 - b. Group 2: the Galilean revolution and its implications for the perception of a New World. Explain how Galileo used his celestial discoveries (the satellites of Jupiter, the phases of Venus, etc.) to refute geocentrism and the idea of the perfection of the sky.
 - c. Group 3: evolution of telescopes and new astronomical discoveries after Galileo (e.g. the real form of Saturn, a broader view of the Solar System thanks to the discovery of new planets, the works and discoveries of later scientists such as Cassini, Huygens, Newton, Herschel etc.), with possible reflections on the new spatial challenges.
3. After delving into Galileo's works and discoveries using the booklet at <https://brunelleschi.imss.fi.it/itineraries/pdf/GalileoBiography.pdf> (in particular the *Sidereus Nuncius* [The Starry Messenger], *Istoria e dimostrazioni intorno alle macchie solari* [History and Demonstrations concerning Sunspots and their Phenomena], *Il Saggiatore* [The Assayer], e il *Dialogo sopra i due massimi sistemi del mondo* [Dialogue concerning the Two Chief World Systems]) and his refutations to Aristotelian and Tychonic theories, organize, in small groups, fictitious debates between students who impersonate, for example, the Aristotelian defenders of geocentric theory and of the perfection of the heavens and scientists who support the heliocentric theory with realistic arguments consistent with the membership group. It could be stimulating to record the debates.



New paths to explore in Virtual Pathways

To strengthen students' sensitivity on the importance of interdisciplinarity and international collaboration and to raise awareness of the modern study of natural phenomena and their implications for environmental life, at the end of the course it is advisable to explore the virtual exhibition on the theme of the Northern Lights, created by the Arktikum Science Center in Finland, for which the Galileo Museum contributed to the creation of a room dedicated to Galilean discoveries. Hosted on the Artsteps platform, it constitutes a new digital tool for science centers and science museums to enable science education in a virtual space.

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