

# ACTIVITY TITLE: SKYSTEAM

Activity code: ncAIJU02



	DURATION	90 minutes
	AGE RANGE	10 – 11 y/o
	TOPICS	Astronomy VR Technology Culture Creativity Collaborative Work



## Description of the project

This activity aims to **introduce students to astronomy from a technological, cultural, creative and inclusive perspective**. By observing the night sky with augmented reality (AR) tools, children will explore the visible constellations, discover how they have been interpreted in different cultures and create their own astronomical representations.

During the session, we will work on key concepts such as:

- Identification of constellations with AR technology.
- Interpretation of the starry sky.
- Use of emerging technologies for astronomical observation.
- Artistic creation as a tool for scientific expression.
- Recognition of the role of women in astronomy.
- Communication of findings through oral and visual presentations. At the end of the activity, participants are expected to:
  - Be able to identify real constellations using digital devices.
  - Understand that the same grouping of stars can have multiple meanings depending on the culture.
  - Design an original constellation, accompanied by a story that reflects their identity or imagination.
  - Participate in a collaborative experience where all members of the group take an active role.



## Objectives: What will I learn?

- **Identify real constellations** by observing the night sky with augmented reality applications, by developing basic astronomical orientation skills in order to connect digital tools with real-world celestial navigation.
- **Recognise how different cultures interpret the same groupings of stars**, by comparing cultural constellation maps and stories, to foster critical thinking, respect for diversity, and scientific curiosity.
- **Design an original constellation** using artistic means (manual or digital) and accompany it with a creative narrative, in order to express personal identity and symbolic meaning through science-art integration.
- **Use technological tools** such as AR apps and visual resources to explore, create, and communicate astronomical knowledge in order to develop students' digital competence and capacity to interpret scientific content through multimedia formats.
- **Make female contributions in the history of astronomy visible** by working with reference materials and inclusive language, to promote a gender perspective and ensure balanced participation and representation.
- **Work collaboratively in teams** with rotating roles to encourage leadership, respectful communication, and democratic decision-making, while practicing cooperative problem-solving throughout the activity.



## Materials: What do I need?

### 1. Provided by the teacher/institution (tools, software, physical materials).

- Printed cards of cultural constellations and women's references
- Adequate and safe outdoor space
- Mobile and/or tablet with augmented reality applications installed, such as Sky Map, Star Walk, Stellarium, etc., possibility of carrying out activities with virtual reality glasses.

### 2. Provided by students (computer, internet access, notebook, pencils).

- Notebook or notebook for notes
- Pencils, markers or pens.

### 3. Downloadable resources (guides, templates, reference examples).

- [Template for the design of an original constellation \(paper or digital format\)](#)
- [Guide to historical and current women astronomers](#)
- [Step-by-step guide with instructions for the teams](#)



## Previous preparation

- Divide students into mixed teams of 3 or 4 people. Assign rotating roles to ensure equal participation: sky explorer, artistic designer, group rapporteur and cultural guide.
- Setting up equipment or software: Check that mobile devices or tablets have sufficient battery life and are up to date.
- Install and check the correct functioning of the selected AR astronomy apps (Sky Map, Star Walk, Stellarium, etc.).
- Print enough copies of:
  - Women astronomers and cultural constellations sheets.
  - Constellation design templates
  - Step-by-step guide for the activity
- Optional: prepare editable digital version if working with tablets.
- Briefly explain what a constellation is, how they are identified and how they differ between cultures.
- Share one or two examples of constellations that are little known or represented from non-Western cultures.
- Introduce the concept of augmented reality and its usefulness in astronomical observation.



## RESEARCH



### Have a look at these resources

Since ancient times, humanity has looked to the sky for answers, guidance, inspiration and meaning. Constellations are not just groupings of stars: they are cultural narratives, mythological maps and expressions of scientific thought. Today, thanks to augmented and virtual reality, we can rediscover the sky as ancient civilizations did... and imagine new ways of interpreting it. This

activity allows students to connect science, culture, art and technology in a playful, visual and inclusive way.

### Real-world examples

- Greek constellations such as Orion or Andromeda are the most commonly taught in the West, but the Mayans, Mapuches, Incas or Australian Aborigines also created their own starry skies.
- Astronomers such as Vera Rubin (dark matter), Cecilia Payne (star composition) and Andrea Ghez (Nobel Prize 2020) have been key to modern astronomy, although their visibility has been limited.
- Applications such as Stellarium or Sky Map make it possible to see the sky in real time from any point on the planet, blending science and technology in an accessible way.

### Key Questions to discuss

- What shapes do you see when you look at the sky? Why?
- Do you think the same constellation can mean different things in different cultures?
- Did you know that many indigenous cultures also have their own constellations? Do you know of any?
- Did you know the name of any women astronomers before this activity?
- How can technology help us see things we couldn't see before?



## CREATE



### Some things you need before beginning

#### Interesting facts:

- **Constellations are not universal:** What is known as “Orion” in Western culture may be “El Choique” (rhea) to the Mapuche, and part of the sacred calendar to the Maya. Each civilization has drawn figures in the sky based on its beliefs, environment, and worldview.

- **Technology can reveal the invisible:** Thanks to augmented and virtual reality, we can identify stars, planets, and constellations even with clouds, light pollution, or in urban areas. We can also view orbital paths, moon phases, and future astronomical events.
- **The sky as a personal mirror:** Creating a constellation is a way to represent what matters to you: an emotion, a story, a role model, a value, or even a dream. In this activity, you can look up and leave your personal mark on the universe.
- **Science, art, and culture are connected:** Astronomy is not just science: it is history, art, literature, mathematics, geography, and identity. By creating your own constellation, you are combining all these areas into a complete experience.
- **Highlighting women scientist's matters:** Many girls do not know the name of any female astronomer. Including them as role models in this activity, helps change that. You too can be an astronomer, an explorer, or a creator of new skies.



## Now, follow these steps

### Step 1. General introduction:

- The teacher introduces the activity and its objectives: to explore the night sky using AR, learn about cultural constellations, and create a new constellation of their own.
- Brief examples of real-life constellations and their cultural variations are shown. Female astronomical figures are introduced to spark interest and promote diverse references.

### Step 2. Team formation and role sharing:

- Form mixed groups of 3 to 4 students.
- Suggested roles:
  - Astronomical Navigator (locates constellations in the app)
  - Reporter (records findings)
  - Designer (draws or digitizes the constellation)
  - Presenter (leads the group's explanation)

### Step 3. Assisted astronomical observation:

- With mobile devices and AR apps enabled, each group should identify at least 3 visible constellations.

- Each team will record on a sheet:
  - Name of each observed constellation
  - Cultural origin
  - Visibility level (high, medium, low)
  - App view vs naked-eye observation"
- If weather conditions permit, they also observe the real sky.
- They compare what they see in AR with what they can see with the naked eye.

#### **Step 4. Cultural and scientific discussion:**

- Groups share aloud or on a shared sheet of paper which constellations they have identified and how they vary across cultures.
- Ask questions such as:
  - Which shapes are repeated?
  - What cultural differences have they observed?
  - What role have women played in what we know about the universe today?
- Additional discussion:
  - How has colonialism or history influenced which constellations are taught today? Why are some cultures more represented than others in current astronomy?

#### **Step 5. Designing a New Constellation:**

- Each group imagines and designs a new constellation. An emotion, a character, an everyday object, a cultural value, or a feminine symbol can inspire it.
- They assign it a name, a symbol, and a short story.
- They can represent it through drawing, collage, design software, or even create an AR simulation in the app if it allows it.
- Find the planets in the solar system and look up their distances in books and/or on the internet. What measurements are they in? Kilometres or light-years?

- After the first version, each team will receive feedback from another team (through notes or open discussion), review their design, and improve it before the final presentation.

### Step 6. Presentation:

- Organize the explanation of their constellation. Prepare a poster, digital slide, or short skit. Girls are encouraged to lead at least part of the presentation.
- In addition to presenting their constellation, each team must explain how they applied STEAM principles:
  - Science (astronomy: constellations)
  - Technology (use of AR)
  - Art (visual creation)
  - Culture (interpretation)
  - Mathematics (positioning and sky orientation)"



## COMMUNICATE

This is the moment for students to show and argue what they have worked on. Each group will have a set amount of time (e.g. 5-7 minutes) to present their data analysis.

- **Explain their design decisions:**
  - Why did they choose that shape and name for their constellation?
  - What does it represent to them? Is it inspired by something personal, cultural, or historical?
  - How did they connect the shape to a narrative (myth, story, emotion, experience)?
- **Compare with real-life examples:**
  - Were they inspired by an existing constellation? How did they modify or reinterpret it?
  - What differences did they notice compared to Greek, Mayan, or other constellations?
  - Have they incorporated any ideas from women scientists or other cultures?
- **Justify their relevance:**
  - Why do they think their constellation should be in the sky?
  - What message does it convey? What values does it represent?
  - How can it inspire others to look at the sky with different eyes?



## It is time to share!

In this section different social media will be presented in order to upload their activity result.

#nameoftheactivity

- LinkedIn: <https://www.linkedin.com/company/steambrace-project/posts/?feedView=all>
- Instagram: [https://www.instagram.com/steambrace\\_eu/](https://www.instagram.com/steambrace_eu/)
- X: [https://www.instagram.com/steambrace\\_eu/](https://www.instagram.com/steambrace_eu/)



## KEEP ON LEARNING



### How can I make a similar project by myself?

#### Reflection Questions:

- What was the most difficult part of designing your constellation? Why?
- What did you learn about the sky that you didn't know before this activity?
- How did your culture, identity, or imagination influence the design you created?
- If you had more time or more tools, what would you improve about your work?
- Do you think you could use this same methodology (observation, design, narrative) to explore other topics such as the environment, the oceans, or history?
- Do you know of any other projects where science blends with art and culture?
- Why do you think sharing different ways of seeing the sky can be useful or important for society?
- What personal or social impact has this activity had on you? Has it changed your view on astronomy or the role of women in science?"



### Which are other connected projects?

- **Simulate an inclusive space mission**
  - Imagine a multicultural crew traveling to study distant stars. Create a mission journal or a presentation where each member contributes from his or her discipline (science, art, history).
- **Explore sustainability in astronomy**
  - Investigate how light pollution affects sky observation and design artistic campaigns to raise community awareness (posters, comics, videos).

- **Design constellations with biodegradable materials**
  - Create physical installations of constellations using sustainable or recycled materials. Then, display your creations in school or community spaces.
- **Write a picture book about the universe**
  - Write and draw a story that revolves around a girl (or boy) discovering their own constellation. Include real science, cultural elements, and fantasy.



## LINKS FOR FURTHER INFORMATION

- **NASA Space Place** - <https://spaceplace.nasa.gov/>
- **European Space Agency** - <https://www.esa.int/kids/en/home>
- **Stellarium Web** - <https://stellarium-web.org/>

## Disclaimer

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