

## WOMEN IN ASTRONOMY COOPERATIVE CARD GAME

### AT A GLANCE

- Age Group: 13-18 years old students, groups and families
- Format: Moderated discussion
- Duration: 20 minutes to 1-hour

### OVERVIEW

By playing a cooperative card game, the public will discover the role of women in astronomy and recognise their contributions and their role in advancing the science of astronomy.

### OBJECTIVES/AIMS

- Offer new role models to teenagers.
- Promote better representation of women in schools, science centres and museums and other informal learning settings.
- Show women's contribution to astronomy throughout history.

### SUGGESTED SCENARIO

The activity can be conducted in an informal learning setting as a moderated discussion or at a school. It can take place within a broader event or as a standalone activity.

### TARGET AUDIENCE

- Age: 13 - 18
- N. participants: 2 - 30
- N. facilitators: 1 or 2 depending on the number of participants
- Type of audience: Students, school groups, families, public

### FORMAT

Moderated discussion.

### TOPICS COVERED BY THE ACTIVITY

Women in Astronomy throughout history, the history of astronomy.

### DURATION OF THE ACTIVITY

20 minutes to one hour, depending on the format and the number of participants.

### MATERIALS

- Cards printed on both sides:
  - FRONT: Photo or painting of a female astronomer + name + a short text presenting them and their biggest/most famous accomplishment or discovery (don't indicate any dates on this side)
  - BACK: Photo or painting of a female astronomer + name + years of birth and death
- 30 cards (or more)
- Hooks or clothes pegs and rope to hang the cards 60 (2 per card)

### SETTING

- If the activity is implemented for a group including more than 10 people: a big wall to hang the cards as the game progresses. You can also choose to place the cards on the floor or a long table.
- If there are between 2 to 10 players: several tables and chairs, each table with a small set of cards. Tables should be able to accommodate the size of the group playing the game.

### GROUP MANAGEMENT

The game can be implemented either for small groups of 2 to 10, or for bigger groups of 10 or more (up to 30).

## DESCRIPTION AND TIME SCALE

### 1. INTRODUCTION

- For a large group, 5 min to explain the game:
  - The facilitator(s) introduce themselves.
  - They show a portrait card: “We are going to travel back and forth in time to meet female astronomers and learn about their discoveries or contributions to astronomy.”
  - “Each card has information about the astronomer in the front and the years of birth and death on the back.”
  - “The goal is to place the cards in the correct chronological order, from the oldest on the left to the newest to the right.”
  - “This is a cooperative game, so you can discuss as a group to find the correct place for each discovery in the timeline.”
- For small groups: Rules of the game are printed ahead of time and left on the tables with a set of cards. A poster close by lets the public know that they can play without asking. Facilitators can stay nearby to provide any necessary explanations.
  - With this game, we will travel through time: we will meet female astronomers and learn about their discoveries. The goal of the game is to build a timeline, placing each card in ascending chronological order according to the astronomer’s year of birth. The front of the card tells us about the astronomers and their discoveries or contributions to the field of astronomy. On the back, you can see their years of birth and death. Shuffle the cards, making sure to keep all “front sides” up. The game starts with the draw of the first card; after reading about the astronomer, place it on the table with the back side of the card up (showing the years). Draw the second card, inspect the information given, and without looking at the back, decide if the card goes to the left or the right of the first card (chronologically). If you think the astronomer was born before, place it to the left. If they were born after, place it to the right. Once you have finished the deck, flip the cards and reposition them in the correct order in the timeline.

#### Note:

- Choose the women you want to show carefully: you need as much diversity as possible in terms of education, age, nationality, sexual orientation (when publicly stated by the woman herself) etc.

## DEVELOPMENT OF THE ACTIVITY

1. After introducing themselves and the game (see into),
2. One of the facilitators reads the front of the first card out loud and hangs it with the date showing.
3. They pick another card, read its information aloud, and ask the group where it should go: before or after the first one.
4. The second facilitator (if there is one) can walk among the public to catch some thoughts and encourage the players to share them with the group.
5. Facilitators can give some clues without providing the correct answer.
6. The card is hung where the group says it should be.
7. The facilitators pick a new card (or ask one of the players to take their role).
8. Players go through the deck, taking their time to discuss where which card goes. They are free to adjust their timeline as they go, revisiting and discussing why they made the choices they made.
9. At the end, the facilitator or one of the players goes through the timeline, turning the cards over to reveal the dates and if necessary, repositioning them. Players are encouraged to discuss their decision-making process.

#### Note:

- The public can participate on several levels:
  - suggest the placement of the cards
  - engage and encourage others by taking the facilitator’s role,

- handle the cards and hang them,
- engage in follow-up discussion
- The facilitator (s) must be briefed on the importance of involving girls/non-binary participants in the discussion. Especially in groups that are predominantly male, as there is a risk that only boys engage in the discussion. The facilitator(s) should also be prepared to hear sexist comments and react accordingly.

## CONCLUSION

1. When the game is completed or time is up, facilitators invite participants to have a look over the entire timeline and facilitate a follow-up discussion, broadening the discussion beyond gender to include other underrepresented communities. A way to start could be: "In a short time, we have seen a lot of discoveries by women throughout history..."
  - a. "Who is your favourite? Why?"
  - b. "Do you know other women who are not represented here?"
  - c. "Why do you think women are under-represented in astronomy?" (Prohibited from teaching, publishing, studying, access to education and tools, stigma, etc.).
  - d. Access: It is worth highlighting that some known female astronomers (Mariam al-Asturlabi, Sophia Brahe, Caroline Herschel, for example) only had access to tools (knowledge, telescopes, etc.) through the man in their lives.
  - e. Many of the historical astronomers featured in the deck were from affluent families: how much class was a factor in ensuring they had access to tools? How is it today?
  - f. Race: include the discussion on the representation of people of colour in the history of astronomy. How many are in the deck, when do their contributions start being recognised, and when do they start having access? How is it today?
  - g. If there is time, a general discussion on how to ensure better representation of underrepresented communities, including women, in STEM, can take place.
2. If the activity is done in an educational setting in which you regularly interact with the participants, you could additionally follow this game up with an assignment for each participant to do some research and make their own cards of (3?) women in astronomy/STEM they can find.
3. The game could also be made with astronomers from your own country or with other underrepresented groups: people of colour, LGBTQ+, etc.

Note: How to create a card?

- The content of the cards, including the portrait and the discovery, can be found in online encyclopaedias (Wikipedia, for example) or in books.
- Be careful when you choose the illustration/picture: it must be free to use (with or without attribution - or make sure your design includes the attribution). You can find online databases to get license-free pictures (Wikimedia commons, for example).
- Here are three examples of cards (the front page of the card is on the left, and the back side of the card is on the right)

\*

## Text

### Rules of the game

With this game, we will travel through time: we will meet female astronomers and learn about their discoveries. The goal of the game is to build a timeline, placing each card in ascending chronological order according to the astronomer's year of birth. The front of the card tells us about the astronomers and their discoveries or contributions to the field of astronomy. On the back, you can see their years of birth and death. Shuffle the cards, making sure to keep all "front sides" up. The game starts with the draw of the first card; after reading about the astronomer, place it on the table with the back side of the card up (showing the years). Draw the second card, inspect the information given, and without looking at the back, decide if the card goes to the left or the right of the first card (chronologically). If you think the astronomer was born before, place it to the left. If they were born after, place it to the right. Once you have finished the deck, flip the cards and reposition them in the correct order in the timeline.