

5.2 Inspiration Workshops

SESSION TITLE

DIVERSITY AND ASTRONOMY



ACTIVITY IN A SENTENCE:

An exploration of how diversity affects decision making and the selective sharing of knowledge based on dominant cultural identities, all through the lens of astronomy.

DISCIPLINES INVOLVED IN ACTIVITIES:

Diversity, Astronomy, Science Communication, Art, Cultural Studies, Activism

RECOMMENDED AGES:

14+

LEARNING ENVIRONMENT (CONTEXT SETTING):

Classroom, informal learning environment

LEARNING OUTCOMES:

- Able to reflect on one's own identity in relation to others
- Understanding of the impact diversity has on decision making
- Understanding the influence of storytelling on science communication
- Able to express one's own cultural identity through storytelling

Cultural diversity forms and shapes trust, bias and activism in society. When activating a project it is vital to understand the culture you are working with and know what cultural shift you may create, intentionally or otherwise.

RECOMMENDED EXPERTISE:

Experience with facilitation is recommended.

SDG LINKS:

- **Goal 5:** Achieve gender equality and empower all women and girls
- **Goal 10:** Reduce inequality within and among countries

TIME IT TAKES TO COMPLETE:

45 – 60 minutes

MATERIALS / RESOURCES NEEDED:

- Presentation Slides
- 3x A4 paper, pencil and ruler per learner
- Cardboard box per learner and tape (OPTIONAL – if choosing Part 3, Option 2)
- Web-enabled device, preferably laptop/computer per learner (OPTIONAL)

CONTENT FOR LEARNERS:

- Presentation – *Activity Handbook – Diversity and Astronomy.pptx*

Note: Copy the presentation into your own folder before editing.

Activity

Introduction:

Part 1: Empathy Map

To lay the foundation for this workshop, start by asking learners to divide a page in four with a pencil and write 'learner' in the middle and in each corner write: SEE (top left), DO (top right), THINK (bottom left), FEEL (bottom right). See Figure 5.1 for an example. A version of this can also be found in the slides linked above.

This is an empathy map for a typical learner where the person 'steps into' the shoes of another to build a picture of their likes, dislikes, wants and needs – a persona.

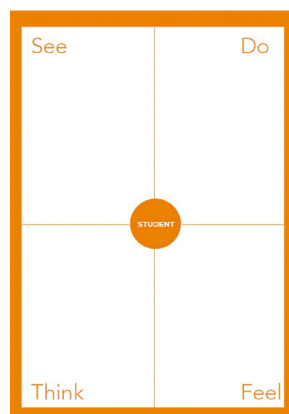


Figure 5.1: Empathy Map. Credit: Open Science Hub Ireland Teacher Handbook 2022/23

Explain that the persona is a 'learner' and ask them to write as many things as come to mind for each of the four categories. As they are learners themselves they should have plenty of experience to draw from, but it may be useful for them to think of another person other than themselves. If it helps, the learner can be in primary school, secondary school or University.

Next, ask learners to make the same layout again on a new page, but pick one of the professions seen on the relevant presentation slide (Empathy Map For Another). They should put this persona (e.g. 'astronomer') in the middle and write as many things that come to mind for each of the see/ do/ think/ feel categories.

Learners do not need to have been introduced to the professions on the slide – just what they think a person in that profession might typically see, do, think and feel.

Ask the following prompts to open discussion about perceptions of careers and people in those careers:

- Do you associate a particular gender with the profession you chose for the second empathy map? Why or why not?
- Do you associate a particular age with that profession? Why or why not?
- Do you associate a particular country or culture with that profession? Why or why not?

Optionally, you can ask learners to use the other side of their A4 page to sketch a cartoon of what a person typical of the profession looks like (clothes, gender, accessories all come into play). This can be done before the prompts above or instead of them, both with the goal of opening up conversations around perceptions of what a scientist/ artist/ civil servant etc 'should' look like.

Show learners the gender breakdown pie chart and explain that this is representative of all the professional astronomers operating worldwide. This is an approximate 80/20 male/ female split with 0.1 percent of astronomers under the category 'other'.

- Is this gender breakdown what you would expect for this profession? Why or why not?
- If we were measuring how 'diverse' the global population of astronomers is, what other demographics could you report on?
- Is the way gender is reported here good enough? (Think about someone forced to choose 'other' as their gender identity).

Part 2: Decisions and Diversity

2.1 Background information

Since people around the world could look up at the stars and talk about them, they have named them and drawn imaginary lines between them to make stories to tell around campfires. The names and stories varied from country to country, but dominant countries and empires spread their stories far and wide. Astronomers call these star patterns constellations.

Fast forward to the early 20th century and astronomers are working together across the world from many different countries and cultures. In 1919 an organisation called the International Astronomical Union was formed to decide on standard naming conventions for professional astronomers to use consistently worldwide. This meant one starmap for all to use with commonly recognised star patterns and names for stars, planets, moons, asteroids, and more.

All professions involve a level of decision making and some decision makers are doing so on behalf of a diverse population – locally, nationally or even internationally. The decision makers often don't reflect the diversity of the population their decisions are affecting. Today astronomers use constellations that don't necessarily

reflect their own cultural identity and yet open any popular astronomy app today and you'll be presented with depictions of Greek stories of animals, people and objects.

2.2 Activity instructions

If learners have access to the Internet, direct them to Stellarium Web on their devices, otherwise you can display this on a screen in the classroom. Along the bottom, the first two icons can be clicked to reveal constellations and their associated artwork.

- Ask learners if they recognise any of the characters/stories.
- Ask learners to find a star name beginning with 'Al' (they will need to zoom in).
- When everyone has found an example they can share what one they've found and then you can explain that those star names are latinised versions of arabic star names (Al – being the arabic for 'the').

Although there are alternative names for all these stars these are the primary names used across the world and show the influence of the work and writings of Arabic astronomer Al-Sufi who produced a famous star catalogue called 'The Book of Fixed Stars' in 964 CE.

The stories represented by these star names and constellations are of their time and place and are like a 'hall of fame' in the sky. Ask learners which person, animal or object would they want represented in the night sky so that they are honoured for centuries to come.

Part 3: Decisions and Diversity

3.1 Background information

Explain to learners that the digital planetarium they (or you) used was created in part thanks to data from a space telescope built by the European Space Agency (ESA) called GAIA.

GAIA measures the positions and motions of more than one billion stars in our galaxy, the Milky Way. All the stars in our galaxy (including the Sun) are moving through space – very fast – but space is very big and seeing any change in their position takes a long time. We call this movement the 'proper motion' of stars.

Playback the video in the presentation ideas in *Stellarium Web* explaining that they are seeing where stars will move over the course of the next two million years. As can be seen, the constellations lose their shape and the stories they had assigned to them become meaningless.

3.2 Activity Instructions

For this concluding activity learners can construct their own constellation in two ways. The concept is that learners are creating a time capsule of new constellations that could be presented to the IAU for use in the distant future to replace the constellations as they warp and make their original star stories redundant.

What are learners' star stories for the year 2 million?

Option 1: Simple drawing

- Ask learners to take a sheet of paper or card and randomly dot it with 10-15 points using a pencil.

- Ask learners to try to come up with a pattern that represents something they would want represented in a constellation to replace the old Greek legend – something that speaks to their cultural identity, something they would want others to celebrate.
- Ask around for learners to share back to the group.

Option 2: Crafting a light box

- Ask learners to take their cereal boxes and carefully separate the seams so it can be turned inside out and taped on the side and at just one end.
- Ask learners to dot one face of the box with 10-15 points using a pencil.
- Ask learners to try to come up with a pattern that represents something they would want represented in a constellation to replace the old Greek legend – something that speaks to their cultural identity, something they wish others would celebrate.
- When they are satisfied with their pattern, ask them to draw pictures around their patterns and write any notes nearby like the name of this new constellation and any story notes.
- Ask around for learners to share back to the group.
- Finish by asking learners to use their pencil to carefully punch holes where their dots are. Learners can then use a light source such as their phone torch and place it in the box so that the light passes through the holes to represent the stars.
- The lights can be turned off and blinds closed to see the constellation light boxes at their best. If possible all the light boxes can be combined to form a 'class star chart' representing the mixed cultural identities of the group.

USEFUL LINKS:

- *IAU Springboard to Action: Recommendations for improving equity, inclusion and diversity in Astronomy*