

How gender inclusive are your science education activities?

Questions to consider!

THE INDIVIDUAL LEARNERS

Make sure the girls and boys who visit your science centre or museum and participate in science education activities do not get the feeling that the activities are only for certain kinds of learners, and not for others. You can do this by not building gendered presumptions into the activities. Consider these questions...

What relevant prior knowledge do learners have?

Does your activity take a point of departure in what learners already know? Remember: different learners have different kinds of knowledge.

For example, the topic 'dinosaurs' may be relevant to some learners due to their prior knowledge about archaeology while it might be relevant to others due to their interest in mass extinctions.

What scientific interests do learners have?

Does your activity allow for several different lines of inquiry that correspond to different ways of being interested in the subject?

For example, an activity may have a technological line of inquiry, a socio-scientific line, and an ethical line.

Does your activity give equal consideration to specific details of the activity and the bigger picture?

For example, some learners may be interested in the broad uses of science, but others may be interested in the technological details of science.

What previous experience do learners have with science?

Do you avoid presenting learners with strongly gendered activities that may contribute to the internalisation of 'female' or 'male' identities?

Present learners with science activities that include its various aspects, for example interpreting and discussing data, having diverging points of view, arguing one's perspective, reaching agreement (or not), etc.

Does your activity include the diversity of science as much as possible?

Science is often considered as one 'scientific method'. But every instance of doing science has its own individual line of inquiry that you can model your activity on.

What experience do learners have with science centres and museums?

Have you considered that learners may have experienced gender exclusion in museums/ science centres?

For example, parents explain science more often to boys than to girls during museum visits. This may affect learners' willingness to participate in the education activity.

Do you encourage all learners to participate equally, and set high expectations for all learners?

For example, some learners may hesitate while others may speak before they think. It is important for educators to encompass these differences.

How does learner's sense of self or identity relate to activity?

Can your activity encompass a variety of different ways of engaging?

For example, some learners might be more comfortable with plenary discussions, others with group work.

How gender inclusive are your science education activities?

Consider these things...

THE INTERACTIONS BETWEEN LEARNERS

It is important to consider how interactions between learners in your science centre/museum may create and reproduce inequality. This may include 'othering' (for instance, treating classmates in gendered ways) or taking/giving a subordinate role (for example, a student taking the role as the 'secretary' of a group in order to be accepted into that group). Consider these questions...

Does activity require different capabilities in a balanced way?

Does your activity have a balanced approach to participants' learning preferences? In other words, does your activity include thinking tasks, hands-on tasks, and value-related tasks?

For example, carrying out an experiment might require primarily motor skills while assessing the ethical implications of a scientific finding might require primarily the ability to assess value arguments.

What kind of interaction does activity require?

Does your activity involve a variety of different interaction forms?

For example, think about including individual work, group work, and dyad interactions.

Do the different roles of learners in your activity have equal status, or do the roles rotate between participants (to counteract instances of 'othering' or subordination)?

For example, if the activity requires learners to take on experimenter, managerial, or secretarial tasks, ensure that learners take turns carrying out these tasks.

What scientific role models do learners encounter?

Do the educators and/or scientists involved in your activity reflect a variety of personalities? Girls and boys are most inspired by role models they feel psychologically similar to. Otherwise, the standards set by the other person become a contrast that girls and boys may react against.

For example, 'career dating' activities often involve meeting scientists. Here, it is important to present the learners with a variety of personalities, genders, and career pathways, not just 'star scientists'. Remember, women can be role models for boys, and men can be role models for girls.

How gender inclusive are your science education activities?

Consider these things...

AT THE LEVEL OF YOUR MUSEUM/SCIENCE CENTRE

Institutions often build gender meanings into their practices. These meanings may become institutional logics, which are difficult for you, as an individual educator, to observe and act upon. However, if you are aware of the potential gendering effects of these practices you can counteract or work around them. Consider these questions...

How does your science centre or museum's core aim shape your activity?

Are you explicit about the socio-scientific role of your institution (e.g. education, building interest) when addressing learners, and about how this shapes the science activities?

For example, a mission statement of 'We aspire to stimulate curiosity and inspire science learning in everyone by creating fun, hands-on experiences' sets the scene for particular ways of doing science that may exclude some kinds of learners.

Have you considered how to align the institution's stated aim with your activity's opportunities for gender inclusion?

For example, are there ways to interpret the stated aims of 'fun' and 'hands-on' (see above example) in activities that include a greater diversity of learners?

How does your institution approach science and STEM, and how is this reflected in your pedagogy?

Have you considered how your institution's approach to science and STEM appeals to different learners in different ways?

For example, the discovery pedagogy of some science centres may appeal to extrovert personalities who enjoy experimentation and risk-taking, whereas the pedagogical approach taken by some museums may appeal to more introvert personalities who enjoy observing and reflecting.

Does the institution focus on a specific scientific discipline, and is it represented in specific ways in the institution?

Have you considered how to take a balanced approach to the discipline in your activity?

For example, it is easy to classify physics as 'hard' and biology as 'soft'; yet all scientific disciplines have built-in dualisms such as hard vs. soft. Science education activities that encompass these dualisms, rather than embracing one extreme, are inclusive to a broader range of learners.

Does your activity ensure that the variety of ways of conducting scientific research are represented in the activity?

For example, biology requires both descriptive activities (drawing or classifying) and experimental activities (laboratory testing).

What kind of engagement does the space support?

How does the physical learning environment support the planned activities?

Exhibitions, laboratories, discovery spaces and reading spaces support different types of activity. For example, many exhibits have one seat, which prompts individual activity. To promote group work, the affordances of the physical space are important.

How gender inclusive are your science education activities

Consider these things...

AT THE LEVEL OF YOUR CULTURE AND SOCIETY

Gender identity is shaped and influenced by the culture and society which institutions, educators, and learners are immersed in. These conditions are difficult or even impossible for you to change, but by being aware of them, you may help offset or counteract their effects. Consider these questions...

How do public interest and ideas set the scene for the activity?

Have you considered how science is represented in certain gendered ways in the public sphere? If you take a point of departure in these public representations (e.g. to spark interest in your activity), you should consider how to support multiple ways of participating in the activity beyond those publicly recognized.

For example, a popular Danish television programme for children presents two male youngsters who carry out engineering inspired activities that often involve high speed and explosives. A science centre might attract visitors with references to the programme. However this might be excluding for certain kinds of learners.

What are the stakeholders' interests and how does that interact with the activity?

Have you considered how gender is implicitly or explicitly discussed by stakeholders (ministries, politicians, funding organisations, interest groups etc.) and the potential effects of this on the activity?

For example, the campaign Science: It's a girl thing! exemplifies how a certain conceptualisation of gender within the EU has a significant, defining effect on the content and activities on the web page.

What are the cultural constraints for the activity?

Have you considered what is included in the definition of 'science' in your national context, and what is excluded? You should consider whether employing a broader conception of 'science' in your activity could support the inclusion of a broader range of learners.

For example, in Italy, a background in the classical languages is considered to be a valid qualification for studying physics. This is in contrast to Denmark, where physics students are required to have a background in math. The consequence of this is that many more girls enter the physics study programme in Italy than in Denmark.