



ADAPTED FROM PEDAGOGICAL SCENARIO D

EMPOWERING

GIRLS IN SCIENCE

CHECKLIST

1

ESTABLISH ENGAGING, LEARNER-CENTERED ENVIRONMENTS FREE FROM BIAS



Develop a gender lens by identifying your own biases (see Resources)

Be an approachable educator to build a rapport with all pupils

Effectively group pupils for the equal participation of girls and boys in class discussions to build confidence and model how to incorporate different perspectives (Jumpstarting Jill)

2

ENCOURAGE THE USE OF RESPONSIBLE RESEARCH AND INNOVATION (RRI) IN THE INQUIRY PROCESS



Connect knowledge to current world news so pupils can relate learning to their own lives

Focus class discussions on real-life scientific problems and think of how to solve them

Research shows that girls tend to orient themselves to STEM content that considers ethics; teach lessons about climate change, the environment, health, etc.

3

AVOID STEREOTYPES COMMONLY ASSOCIATED WITH WOMEN IN STEM FIELDS



Conduct interviews with female pupils and staff about stereotypes in science

Give examples of how STEM fields are becoming more diverse (ex. more women are joining them)

Telling women that STEM fields are becoming more diverse makes them more likely to consider these fields for their future studies (Sapna et al. 2013)

4

USE FEMALE ROLE MODELS AS EXAMPLES OF SUCCESSFUL SCIENTISTS



Encourage pupils to take risks and try new things by giving examples

Share stories of women who took risks in science (Jumpstarting Jill)

Undergraduate women who saw biographies of female engineers had more positive attitudes toward math compared to women who saw biographies of male engineers (Stout et al. 2011)

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STRATEGIES

TO INCLUDE GIRLS IN SCIENCE



ORIENTATION

- Use metaphors and examples such as a bus or the school building to explain science concepts; **use words to which all pupils have access** (girlfriendlyphysics.co.uk).
- Have the same high expectations for all of your pupils: having high expectations means pupils generally rise to meet them (Blickenstaff 2006).

CONCEPTUALIZATION

- **Encourage equal sharing** during questioning and hypothesis generation to build confidence. Ex. Assign roles to pupils in class groups so everyone participates in their own way (see Resources section).
- Look at the groups' gender balance; how many girls are there? Are they actively involved?

INVESTIGATION

- Give **specific feedback** related to pupils' learning strategies. Ex. tell pupils that they used good critical thinking skills to make their hypotheses, rather than just telling them "good job". Share stories about women in science/ STEM who took risks (Jumpstarting Jill).
- **Model problem-solving** by sharing your own stories of success/failure in science (Jumpstarting Jill)

CONCLUSION

- Ask pupils to **share their learning experiences** in the science classroom (using a journal or discussions). This will allow you determine pupils' interests and determine the effectiveness of your teaching strategies.
- Encourage pupils to use their new scientific knowledge **to reflect and make conclusions**.

DISCUSSION

- **Be approachable as an educator, offer ungraded assignments, and encourage pupil collaboration**; 90% of pupils who chose to switch out of a science degree in university felt their science instructors were unapproachable, and used competitive grading too often. This stopped them from improving their understanding in a collaborative setting (Blickenstaff, 2006)

RESOURCES



1. Effective class grouping strategies: <http://www.scholastic.com/teachers/top-teaching/2013/11/15-quick-and-creative-ways-group-and-partner-students>
2. Outlines profiles of female scientists who invented useful items: <http://girlfriendlyphysics.co.uk/women.html>
3. Gives information about women in science, and offers support for educators who want to ensure girls' success in science: <http://sciencegrrl.co.uk/>
4. Gives examples of current female scientists. Pupils can take quizzes that match their interests to explore careers in STEM: <http://science-girl-thing.eu/en>
5. Shows how to develop a gender lens for different work environments: <http://unesdoc.unesco.org/images/0015/001548/154837e.pdf>
6. Interactive online resource offered in multiple languages. Allows investigation without assigned grades: <http://www.experiencingmaths.org/>