



# Smithsonian

## Science Education Center

### Network for Socio-Scientific Thinking Glossary

#### Contextualization for Educators

Note: The contextualization below is just one example what these terms could mean for educators; it does not represent the experiences of all.

Key Terms		Context
Term	Definition	What does this mean for . . . /Why is this term important to . . . ?
<b>Complexity Theory</b>	Complexity theory tries to explain and understand how and why interactions between objects and systems develop and change, as well as the influence these relationships have on objects and systems which initially appear to have no connection to the primary relationship being observed.	Educators should know about complexity theory because it offers students a sets of shifts in thinking about the world, such as the concepts of interdependence and systems-thinking, which can be used by students to engage with and act on <a href="#">socio-scientific issues</a> .
<b>Emergence</b>	Emergence refers to the phenomena of a new or unique behavior or dynamic arising from the interaction of two objects or systems which does not occur otherwise. Emergence is surprising and <a href="#">complex</a> because this new characteristic is not present in the individual object/systems separately.  <i>Examples: cultural gestures like the handshake, wicked problems like climate change, or questions of existence, like human consciousness</i>	Understanding emergence as an educator will help you better explain or break down <a href="#">socio-scientific issues</a> , and current events within them for your students. You can also examine your classroom or school with an eye for emergent properties to help support or preserve the learning or culture you would like to see.

Glossary compiled by Smithsonian Science Education Center’s Network for Socio-Scientific Thinking (NESST)

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<b>Global Citizenship Education (GCED)</b>	GCED frames learning in a way to encourage a sense of global and local belonging and awareness of the world's <a href="#">complexity</a> and interconnectedness and collective, inclusive action-taking for a just, peaceful, and sustainable future.	GCED can help both you and your students contextualize learning for the past, present, and future of your own community and lives. Developing a sense of interconnectedness and belonging also supports mental health and helps remind individuals to think about who in their community can support them.
<b>Scientific Literacy</b>	Scientific literacy means having a solid grasp of scientific ideas and how they apply to real-life situations. It involves understanding scientific facts, thinking critically about scientific claims, and using evidence to make informed choices. Being scientifically literate helps you appreciate science and make sense of the world around you.  <i>Examples: Using data to make informed choices about health/environmental/technological decisions</i>	Scientific literacy to teachers means equipping students with essential knowledge and skills to understand, analyze, and critically evaluate scientific concepts. It involves fostering curiosity, promoting scientific inquiry, and developing a strong foundation in scientific principles. Teachers strive to cultivate a scientifically literate society capable of informed decision-making and engaging with scientific advancements.
<b>Social Justice</b>	Social justice means ensuring fairness and equality for all members of society. It involves addressing and correcting systemic inequalities and discrimination based on factors like race, gender, socioeconomic status, and more. Social justice aims to create a society where everyone has equal access to opportunities, resources, and rights, promoting a just and inclusive community.  <i>Examples: healthcare equity, criminal justice reform, access to education</i>	Social justice to teachers means creating equitable learning environments where every student has equal opportunities for success, regardless of their background or identity. It involves addressing systemic inequalities, advocating for marginalized students, fostering inclusivity, and empowering students to become critical thinkers and agents of change in society.

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<b>Socio-scientific Issues</b>	<p>Socio-scientific issues (SSI) are topics which bring science together with other fields, often to respond to a moral or ethical dilemma. These issues require an understanding of science/scientific skills in order to engage with them in an informed way and better support community decision-making and societal values around the topic.</p> <p><i>Examples: climate change, genetic engineering, animal testing, and vaccination policies</i></p>	<p>Teaching socio-scientific issues can provide students context for science and encourage the development of skills in evidence-based reasoning, community dialogue. These issues are personally meaningful and engaging to students, encouraging them to <a href="#">take action</a> using their knowledge.</p>
<b>Student Action-taking</b>	<p>Student action-taking refers to the ability of students to intentionally generate action for themselves and their community based on what they have experienced and learned. Action-taking increases students' sense of agency, and continued action-taking helps students move from simply executing actions to putting considered actions into place.</p> <p><i>Examples of places for student action-taking: school projects, volunteering, extra-curriculars, personal goal-setting, convincing family members to make alternative lifestyle choices</i></p>	<p>Teachers can help support student learning by changing their role from knowledge holder to mentor using student action-taking projects. These projects provide opportunities for deep learning for students as well as increases their capacity to act for a sustainable future.</p>
<b>Transdisciplinary Learning</b>	<p>Transdisciplinary learning utilizes real-life contexts, situations, and problems as the entry point for learning, and asks students to draw on tools, skills, and ways of knowing from multiple disciplines and cultures. In this way, students learn how to transfer skills and knowledge systems to any situation they encounter, regardless of how that topic is framed in traditional education.</p> <p><i>Examples: Climate Change Education, Social Justice Education</i></p>	<p>Transdisciplinary learning helps prepare students to address complex global issues by supporting their ability to transfer skills between multiple topics (e.g., graphing skills are not just for math, but also science).</p>

Want to know more? Find out what each term means in the context of the following roles:

[NESST Members](#)

[Researchers](#)

[Youth](#)

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