



www.siemens-stiftung.org/en/projects/stem-and-values

STEM and values

Creating values in science and technology education

Our society is in the midst of a period of immense change. The simultaneity of individualization, digitalization, and heterogeneity creates many options, chances, and new perspectives. But at the same time, these things make our lives more complex, less clear, and less stable: What can provide us with a sense of orientation and sure footing? How can people responsibly live side by side in a shifting society?

Values create an indispensable foundation for personal development and social cohesion by reconciling different convictions and serving as a guide. In addition, values strengthen identity and are important for developing an active character that is geared toward the greater good.

Through the international educational program Experimento, Siemens Stiftung is committed to value-based learning and teaching in science and technology education. Linking STEM and values spreads specialized knowledge while providing pupils with a space for experimentation where they encounter, experience, and reflect upon values. Children and youths are in particular need of points of reference and pioneering examples to find their own path in life, to develop a strong character, and to familiarize themselves with diversity.

Experimento – The Siemens Stiftung international educational program Experimento offers teachers an everyday, curriculum-oriented selection of topics in the areas of energy, the environment, and health. The accompanying materials are made available with a public license as Open Educational Resources (OER) in the Siemens Stiftung Media Portal.
<https://medienportal.siemens-stiftung.org>



Encountering, experiencing, and reflecting on values

Building values in science and technology education has a particular significance, allowing the interaction between science, technology, and society to be taken in and critically examined. Questions are formed as part of this process, which require cooperation, communication, and reflection skills to collaboratively come up with solutions. This encourages behaviors and skills that allow participation in society as a confident, responsible, and socially-conscious person.

Siemens Stiftung has developed the corresponding content together with partners, so students can grapple with value-forming questions during experiments and experience societal values in real-world scenarios.



Value-based experimentation instructions for primary school lessons

We work with Munich's Ludwig-Maximilians-Universität to integrate value-related questions into Experimento, allowing primary school children to take part in value-building, discovery-based learning. The values selected for inclusion, such as teamwork or tolerance, are part of the learning process. 'Subject-oriented' values, such as solidarity or sustainability, are related to Experimento's topic areas: energy, the environment, and health. Self-responsibility, initiative, and openness are taught as part of the learning process and as subject-oriented values. Methodical and impact-oriented support for the learning process comes through impulse techniques and dilemma situations.

Creating values in STEM subjects with Service-Learning

The learning and teaching method known as Service-Learning – Learning through Civic Engagement connects school education with civic engagement, further promoting value creating in STEM lessons. We work with Freudenberg Stiftung to increase the use of Service-Learning in STEM subjects: through their engagement in their neighborhood or community, students experience the societal relevance of science and technology and reflect upon this concept as part of their lessons. The children make connections to their own lives and are motivated to actively consider their own perceptions of values.

Developing inclusive experiments

Siemens Stiftung supports teachers in implementing inclusive lessons in STEM subjects. Along with the Senatsverwaltung für Bildung, Jugend und Wissenschaft, Berlin's iMINT-Akademie and the Landesinstitut für Schulqualität und Lehrerbildung Sachsen-Anhalt (LISA), we have developed inclusive experiments for use in STEM subjects. These are designed for students aged 10-16, regardless of their learning capabilities, methods, or pace. Working together in diverse groups, the students tackle sophisticated science and technology issues. The teaching and learning materials are based on the Siemens Stiftung international educational program Experimento and the experimental standards for inclusive instruction from the iMINT-Akademie.

Siemens Stiftung supports the creation of values in science and technology education.

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As a nonprofit corporate foundation, we promote sustainable social development, which is crucially dependent on access to basic services, high-quality education and an understanding of culture. Our international project work supports people in taking the initiative to responsibly address current challenges. The geographical focus of our work is on regions in Africa and Latin America as well as Germany and other European countries. We develop solutions and programs with partners and implement them together. Technological and social innovations play a key role in this work. Our actions are impact-oriented and conducted in a transparent manner.