



## STEM Innovations and Global Competence

*Use the list below to explore supplemental resources that can enhance STEM innovations and global competence. Try incorporating these resources into future lessons and unit plans!*

### STEM-Specific Global Education Resources

#### **APPLES**

Educators in this project will have access to, contribute to, and disseminate information from the long-term and ongoing research project which focuses on changes in the phenology of arctic plants and how this relates to climate change.

#### **ArcGIS Story Maps**

ArcGIS StoryMaps is a story authoring web-based application that allows you to share maps in the context of narrative text and other multimedia content.

#### **BioMimicry Institute**

“For eons, nature has solved its problems with well-adapted designs, life-friendly chemistry, and smart material and energy use. We exist to shine a light on nature’s genius, and bridge pressing design challenges with proven biological strategies for a better future. To amplify our impact, we unite educators, innovators, changemakers, scientists, and others passionate about solving environmental and social challenges through nature-inspired design.”

#### **Code.org**

Intro coding for all school levels. “Hour of Code” annual event. Includes training and a professional network that may offer mentoring and collaboration on classroom projects or project sharing that could be extended to classrooms globally. Could be as simple as students creating projects using the same code.org platform and then sharing with a sister school from another country. Resources are free and web based.

#### **Cooper Hewitt Design Challenge**

Annual challenge for high school students to use the Design Thinking Process to create a more just and peaceful world.

#### **eBird**

“eBird began with a simple idea—that every birdwatcher has unique knowledge and experience. Our goal is to gather this information in the form of checklists of birds, archive it, and freely share it to power new data-driven approaches to science, conservation and education. At the same time, we develop tools that make birding more rewarding. From being able to manage lists, photos and audio recordings, to seeing real-time maps of species distribution, to alerts that let you know when species have been seen, we strive to provide the most current and useful information to the birding community. eBird is among the world’s largest biodiversity-related science projects, with more than 100 million bird sightings contributed annually by eBirders around the world.”

#### **EcoTeach**

Offers educational trips and real-world experiences for students and teachers.

#### **FrogWatch USA**

FrogWatch USA is a citizen science program and provides individuals, groups, and families opportunities to learn about wetlands in their communities by reporting on the calls of local frogs and toads.



### **GeoChallenge**

Empowers young people to learn about issues in their community, engage in critical thinking to identify innovative solutions, and take action as champions for the planet.

### **GLANIS**

A one-stop shop for information about aquatic nonindigenous species in the Laurentian Great Lakes region of North America.

### **Global Amphibian Bioblitz**

The diversity of their shapes, sizes, colors and behaviors are absolutely extraordinary! The Global Amphibian BioBlitz not only showcases that diversity, but it also helps researchers, conservationists and concerned global citizens share information and move forward actions that conserve these incredible amphibians around the world.

### **Global Environmental Education Group**

Hub for global environmental education professional development

### **Global Teach Ag Network**

Empowers educators to address global issues in the areas of agriculture and food security. The Global Teach Ag Network connects global experts, practitioners, organizations, and businesses to educators around the world.

### **Globe Program**

An international science and education program that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process and contribute meaningfully to our understanding of the Earth system and global environment.

### **Google Earth Outreach**

The new creation tools in Google Earth allow you to easily create and share maps and stories about our world as an Earth project. You can create a project on any subject of your choosing, drawing placemarks, lines and shapes, adding rich contextual information to your places (text, links, images, videos, 3D views and Street View), and organizing your project into a narrative flow. You can share your project and collaborate with others. In presentation mode, viewers will fly from one place to the next following the narrative of your project, immersing them in the journey through Google Earth's imagery and the custom content you provide.

### **Harmful Algae**

Harmful algal blooms can be used to illustrate important concepts in biology, ecology, marine science, global data analysis, and more. Materials that educators can incorporate into curriculum. Updated as new activities and resources become available.

### **iNaturalist**

Global citizen science, data collection, and sharing.

### **KidWind**

A hands-on design celebration that engages students through the lens of wind and solar energy. Student teams design, construct, and test small scale wind turbines and solar structures at events all over the world.

### **Level Up Village**

STEAM courses for students in K-9 and Global Citizen Series courses for students ages 14 and up. Schools run our courses to students in-school, after school, and during the summer. In each course, students are connected with peers in other countries – students exchange video letters with their global partner students and collaborate on projects.



#### **MBARI Earth Partnership**

Partnership effort with college professors and grad students who want to share their data/research with a greater audience. Teachers create lessons based on their research.

#### **Merlin App**

Has bird song recognition soundscape packs from around the world. Artificial intelligence captures song and graphs it as soundscapes.

#### **The Morpho Institute**

Experiences and resources that support local to global environmental stewardship in K-12 education.

#### **NASA Earth Observatory: Global Temperatures**

#### **National Geographic Grosvenor Teaching Fellowship Program**

#### **National Geographic Society: Education Resources**

Immersive experiences, interactive lesson plans, maps, and other free resources.

#### **National Phenology Network**

Brings together volunteer observers, government agencies, non-profit groups, educators and students of all ages to monitor the impacts of climate change on plants and animals in the United States.

#### **National Science Teaching Association**

Global Connections articles and resources including interdisciplinary [Global PBL planning timeline](#)

#### **NEA Global Learning Fellowship Program**

#### **NOAA Teachers at Sea Program**

#### **Peace Corps Educator Resources: STEM**

#### **Sea Grant**

#### **Smithsonian Science for Global Goals**

Through a series of freely available community research guides, young people use their communities as their laboratory to investigate the science that underlies the [United Nations Sustainable Development Goals \(SDGs\)](#).  
Example: [Food Curriculum](#)

#### **STEM Alive Resources**

PBS Learning Media

#### **Vernier**

Science and STEM education software and data collection probes; includes links to webinars, resources, technology guidance.

#### **Wind for Schools**

Helps develop a future wind energy workforce by encouraging students at higher education institutions to join [Wind Application Centers](#) and serve as project consultants for small wind turbine installations at rural elementary and secondary schools.



## STEM Innovations and Global Competence

### **World Central Kitchen**

Disaster relief in establishing resilient food systems, “Food is a universal human right.”

### **World Food Prize**

Each year, over 200 exceptional high school students from around the world are selected to participate in the three-day Global Youth Institute hosted by the World Food Prize Foundation. Selected students and their teachers/mentors travel to Des Moines, Iowa, USA, in mid-October to attend this three-day event at which they interact with Nobel and World Food Prize Laureates and discuss pressing food security and agricultural issues with international experts. During the conference, student delegates present and discuss their findings with international experts and their peers, connect with other students from around the world, tour cutting-edge industrial and research facilities, and take part in symposium discussions with global leaders in science, industry, and policy.

### **WWF Education**

Connecting educators and parents with the tools and resources they need to help kids explore and understand the world around them.

## Cross-Curricular Global Education Resources

### **Asia Society**

The Asia Society is a non-profit organization focused on educating the world about Asia. Across the fields of arts, business, culture, education, and policy, the Society provides insight, generates ideas, and promotes collaboration to address present challenges and create a shared future.

### **Center for Contemporary Arab Studies**

Sponsored by Georgetown University, this site provides online resources for teachers of Arab history and culture.

### **Center for Interactive Learning and Collaboration**

Connecting children and K-5 educators to compelling content and powerful, interactive learning experiences, leveling the playing field for all learners, regardless of location.

### **The Choices Program**

This program, based at Brown University, develops curricula on current and historical international issues and offers workshops, institutes, and in-service programs for high school teachers.

### **Creative Connections**

Creates and facilitates arts-based exchanges between classrooms in the US and their peers around the world.

### **Digital Explorer**

Digital Explorer’s mission is to provide global citizenship education for young people by creating collaboration between explorers, scientists, teachers, and pupils, including face-to-face visits with explorers and scientists, youth expeditions, video links between classrooms and expeditions, and teacher training.

### **Earth Hour**

Earth Hour is an environmental action group using crowd funding to support a series of worldwide projects.

### **ePals**

Global learning pen pal organization.



### **Flat Connections Project**

A global hands-on working-together project for middle and senior high school students intended to “flatten” or lower classroom walls by linking two or more classes from around the world online to make one large classroom.

### **FocalPoint**

We connect youth ages 12-19 from different countries using low-cost online tools to discuss and learn about a critical issue facing both their communities. We match youth with local organizations to complete projects to combat issues. Foster global partnerships to create leaders who bring about social change in their communities.

### **Fulbright Teachers for Global Classrooms**

The Fulbright Teachers for Global Classrooms Program is a yearlong professional learning opportunity and short-term exchange for U.S. K-12 educators to develop skills to prepare students for a competitive global economy. The program equips educators to bring an international perspective to their schools through targeted training, experience abroad, and global collaboration.

### **Geocube**

Geocube is an online geography resource.

### **Global Classrooms, UNA-USA**

An educational program for middle school and high school students to explore current world issues through interactive simulations and curricular materials. Cultivates literacy, life skills, and attitudes for active citizenship.

### **Global Education Collaborative**

This wiki site serves as a repository for global education materials.

### **Global Guides Program**

The World Food Prize “Global Guides” Track is an exclusive 9-month professional development program for educators that includes attendance at the World Food Prize Dialogue and Global Youth Institute (GYI) in Des Moines, Iowa with continued learning and online mentoring support sessions beyond the in-person conference.

### **Global Nomads Group**

GNG’s mission is to foster dialogue and understanding among the world’s youth by using such media such as interactive videoconferencing, webcasting, social networking, gaming, and participatory filmmaking.

### **Global Peacebuilding Center, United States Institute of Peace**

The United States Institute of Peace is an independent, nonpartisan institution established and funded by Congress to increase the nation’s capacity to manage international conflict without violence. The site contains resources for students and educators on tools that peace builders use, conflict styles, countries and regions, and more.

### **Global SchoolNet**

Global SchoolNet’s mission is to support 21st century learning and improve academic performance through content-driven collaboration. We engage educators and students in e-learning projects worldwide to develop science, math, literacy, and communication skills, foster teamwork, civic responsibility, and collaboration, encourage workforce preparedness, and create multi-cultural understanding.

### **Global Voices**

An international, volunteer-led project that collects, summarizes, and gives context to some of the best self-published content found on blogs, podcasts, photo sharing sites, and videoblogs from around the world, with an emphasis on countries outside of Europe and North America. The site reports on 167 countries. Topics include arts & culture, breaking news, history, human rights, migration, music and more.



### **High Tech High PBL Database**

Includes environmental science and other global/cultural projects

### **IREX**

IREX designs programs and provides consulting to support lifelong learning starting at the primary and secondary levels, continuing through higher education, and including continuing professional training.

### **Learning for Justice**

A project of the Southern Poverty Law Center. It is a place for educators to find news, conversation, information, resources and support for teaching issues of diversity, equal opportunity and respect for differences in schools.

### **Middle East Outreach Council**

MEOC is a national network of educators dedicated to providing unbiased information, resources and activities on the Middle East, including Israel, Iran, Turkey and Afghanistan. The group has an annual conference, book award and website resources.

### **The miniature earth PROJECT**

This project has tried to simplify world population statistics by shrinking the total number down to just 100 people. Everything becomes much easier to talk about when numbers are in the hundreds instead of billions.

### **National Geographic: Education**

Educational resources and links for a wide range of topics covered by the magazine.

### **National Peace Corps Association**

This organization of former Peace Corps volunteers provides service and educational opportunities that build on the Peace Corps experience. It is also an advocate for an independent and robust Peace Corps.

### **OneWorld Classrooms**

Mission is to foster global awareness and cross-cultural understanding of young people by using art and technology to connect classrooms worldwide. Sponsors workshops, assemblies, and professional development.

### **100 People: A World Portrait**

The 100 People Foundation helps students to better understand the complex issues facing our planet. By framing the global population as 100 people, our media makes education more engaging and effective, and improves students' abilities to remember and relate to what they learn. Teachers worldwide have used the site to enrich lesson plans and engage students in learning about the world population.

### **PenPal News**

PenPal News connects thousands of students from around the world to discover new cultures, learn about global issues, and practice foreign languages in 6-week PenPal exchanges. The goal is to get students practicing literacy-based skills and critical thinking, while having meaningful conversations and gaining new perspectives.

### **People to People International**

Programs for students and adults that advance *Peace through Understanding*. Local chapters of volunteers worldwide work to improve communities through service and international relief efforts. More than 20,000 adults and students travel internationally each year. Global Youth Forums for students ages 13-18 enhance international understanding, education, leadership and humanitarianism through face-to-face interaction.

### **Playing for Change**

Playing for Change is a multimedia music project, created by the American producer and sound engineer Mark Johnson of Timeless Media Group, that seeks to inspire, connect, and bring peace to the world through music.



### **Primary Source**

Primary Source promotes history and humanities education by connecting educators to people and cultures throughout the world. In partnership with teachers, scholars, and the broader community, Primary Source provides learning opportunities and curriculum resources for K-12 educators.

### **Project Explorer**

Project Explorer creates and distributes online videos for students on a wide range of interrelated subjects, connecting U.S. and World History, Literature, Music, Language, Arts, Social Studies and Sciences to help students form lasting links between lessons. It also provides lesson plans at three academic levels that adhere to National Curriculum Standards or Common Core Standards. Its catalog includes more than 400 original videos and 1,500+ documents.

### **Pulitzer Center**

The Pulitzer Center on Crisis Reporting is a non-profit journalism organization that supports independent international journalism, including under-reported topics, and creating platforms that reach broad audiences. The Center's educational programs provide students with fresh information on global issues, help them think critically about the creation and dissemination of news, and inspire them to become active consumers. For teachers, the center can help educators globalize their class, make connections to the local community, or bring your units alive with journalists fresh from the field.

### **Roots & Shoots**

Roots & Shoots is a youth-led community action and learning program of the Jane Goodall Institute. Through the program, young people map their community to identify specific challenges their neighborhoods face. From there, they prioritize the problems, develop a plan for a solution, and take action.

### **SDGs In Action**

Learn about the 17 SDGs, get news on your favorite goals, find out what you can do to achieve them, create your own events, and invite others to join you in sustainable actions and events.

The SDGs in Action app features:

- Detailed information about each of the 17 goals, including targets, explanatory videos, key facts and figures, and suggestions on how you can help achieve them take action.
- The latest sustainable development news from around the world. See how innovation is helping to achieve the goals, interact with global citizens around the world and see the latest news.
- The ability to choose what goals are important to you and receive notifications about that goal.
- Access to the World's Largest Lesson explaining each of the Sustainable Development Goals.
- Find actions and events near you that you can join to support the goals.
- The ability to create Actions you're planning in your area and invite others to join.

### **Skype a Scientist**

Connecting scientists with classrooms around the globe.

### **Taking IT Global**

Empowers youth to understand and act on global issues. Check out the "Music for Social Change," interactive section!

### **Voices of Youth**

This site is designed for youth around the world to share information about their community with others both locally and internationally. Young people post blogs on a wide range of global issues.



## STEM Innovations and Global Competence

### **The World Food Prize**

The Global Youth Institute and Borlaug-Ruan International Internship programs are youth programs in which high school students can interact and work alongside international leaders in science, industry, and policy who are working to end world hunger.

### **World Savvy**

Provides teachers with resources to help transform students into global citizens. World Savvy helps students develop global awareness, an understanding of the rights and responsibilities of global citizenship, value for diversity of thought and experience, understanding of historical context of events, commitment to social justice, empathy for others, and a respect for different religious, political, and cultural viewpoints.

## Global Project Based Learning Resources

(\*Please note: Some do not require travel, as they are technology-based!)

### **Bureau of Educational and Cultural Affairs**

Programs focus primarily on secondary schools and promote mutual understanding, leadership development, educational transformation, and democratic ideals.

### **ePals**

Collaborative technology connecting classrooms for project-based learning.

### **iEarn (International Education and Resource Network)**

Web-based exchange for teachers, providing online forums for sharing and involvement in projects with classrooms around the world.

### **PBL Rubrics, Checklists and Sample Projects**

### **Peace Corps' Coverdell World Wise Schools Correspondence Match**

Pairs Peace Corps volunteers in the field with U.S. classroom teachers. Resources include a Peace Corps' Classroom Guide to Cross-Cultural Understanding. Lesson plan database searchable by age, issue, and region of the world.

### **Peace Jam Foundation**

Creating young leaders committed to positive change in themselves, their communities, and the world through the inspiration of Nobel Peace Laureates who pass on the spirit, skills, and wisdom they embody.

### **Roots & Shoots: The Power of Youth is Global**

The Roots & Shoots program is about making positive change happen—for people, for animals and for the environment. With tens of thousands of young people in more than 120 countries, the network connects youth of all ages who share a desire to create a better world. Young people identify problems in their communities and take action through youth-led service projects.

### **Sister Cities International**

A citizen diplomacy network fostering partnerships between the U.S. and communities abroad.

### **Taking IT Global**

Empowers youth to understand and act on global issues. Check out the "Music for Social Change," interactive section: awesome!





## STEM Innovations and Global Competence

### STEM and Global Education Book Recommendations

#### **The Global Goals of Sustainable Development**

A graphic novel on the goals of sustainable development.

#### **Best STEM Books K-12 2022**

NSTA (National Science Teachers Association) book recommendations.

#### **SDG Book Club**

#### **Recommended Books for Teaching the UN Sustainable Development Goals**

#### **Books for SDG's and Design Thinking**

#### **Ignite Her Curiosity: 60 Books to Inspire STEM Loving Mighty Girls**