

CAREER CLUSTER: Education & Training	DURATION: Approximately 20 sessions, but can be modified to fit classroom schedules. (Session = 45 to 50 Minutes)	TEACHER:	U.N. SUSTAINABLE DEVELOPMENT GOAL: #4 — Quality Education
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GLOBAL ISSUE OVERVIEW

Education is the foundation of a society's prosperity and the benefits of a quality education are far-reaching. When people are well-educated, they increase the likelihood of breaking the poverty cycle, empowering themselves to live healthier lives of equality and increased affluence. Tolerant and peaceful societies are typically rooted in the quality of their educational systems.

Consider these facts regarding education and poverty in 2018 from the [Global Partnership for Education](#):

- If all children left school with basic reading skills, 171 million people could move out of extreme poverty. That's equivalent to a 12% decrease.
- Education increases earnings by roughly 10% per each additional year of schooling.
- Educational attainment explained about half of the difference in growth rates between East Asia and sub-Saharan Africa from 1965 and 2010.
- Each additional year of schooling raises average annual growth domestic product (GDP) growth by 0.37%. Increasing tertiary education attainment by one year on average would increase sub-Saharan Africa's long-term GDP by 16%.
- It is estimated that over two billion jobs will be lost to automation by the year 2030, requiring a more skilled and highly trained workforce.

Progress has been made toward ensuring quality education mostly in primary education where enrollment has surpassed 90% globally. In addition, many developed countries' access to computers/the internet has reached 60%. Collectively, these improvements are outstanding, but they mask other challenges that many underserved populations still face. Populations in sub-Saharan Africa and Southeast Asia make up a majority of the population not enrolled in school. Furthermore, gender inequality persists with about one-third of women and girls in developing countries not attending school. The data also demonstrates educational disparities between impoverished peoples especially in rural areas and across all countries regardless of the country's economic prosperity.

Given the importance and impact of education, the United Nations focused their fourth sustainable development goal on quality education. This goal states, “Ensure inclusive and equitable quality education and promote lifelong learning for all.” To achieve this goal by 2030, they have set forth 10 targets focusing on improving educational access, gender equality, improving facilities, recruiting, training, and attaining quality educators, improving outcomes, and promoting global citizenship.

Global Competencies Addressed:

- *Investigate the World:* Initiate investigations of the world by framing questions, analyzing and synthesizing relevant evidence, and drawing reasonable conclusions about global issues.
- *Recognize Perspectives:* Recognize, articulate, and apply an understanding of different perspectives.
- *Communicate Ideas:* Select and apply appropriate tools and strategies to communicate and collaborate effectively — meeting the needs and expectations of diverse individuals and groups.
- *Take Action:* Translate ideas, concerns, and findings into appropriate and responsible individual or collaborative actions to improve conditions.

STANDARDS ADDRESSED

Career/Technical Knowledge and Skills	Academic Knowledge and Skills	21 st Century Skills
<p>Common Career Technical Core Career Ready Practices</p> <p>2. Apply appropriate academic and technical skills.</p> <p>4. Communicate clearly and effectively and with reason.</p> <p>7. Employ valid and reliable research strategies.</p> <p>8. Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>9. Model integrity, ethical leadership, and effective management.</p> <p>12. Work productively in teams while using cultural global competence.</p> <p>Education & Training Career Cluster</p> <ul style="list-style-type: none"> • ESS03.04. Conduct technical research to gather information necessary for decision-making. 	<p>Common Core Academic Standards</p> <p>Mathematics:</p> <ul style="list-style-type: none"> • HSS.IC.B.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. • HSS.IC.B.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. • HSS.IC.B.6. Evaluate reports based on data. <p>ELA/Literacy:</p> <ul style="list-style-type: none"> • RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. 	<p>Learning & Innovation Skills</p> <p>Communication</p> <ul style="list-style-type: none"> • Communicate Clearly: <ul style="list-style-type: none"> ○ Articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts. ○ Use communication for a range of purposes (e.g., to inform, instruct, motivate, and persuade). <p>Information, Media, & Technology Skills</p> <p>Information Literacy:</p>

- **ED 1.** Apply communication skills with students, parents, and other groups to enhance learning and a commitment to learning.
- **ED 2.** Demonstrate effective oral, written, and multimedia communication in multiple formats and contexts.

- **RST.11-12.8.** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- **RST.11-12.9.** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- **SL.11-12.4.** Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
- **SL.11-12.5.** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, evidence and to add interest.

- Access and Evaluate Information:
 - Access information efficiently (time) and effectively (sources).
 - Evaluate information critically and competently.
- Use and Manage Information:
 - Use information accurately and creatively for the issue or problem at hand.
 - Manage the flow of information from a wide variety of sources.

PROJECT DEFINITION & GOALS/OBJECTIVES

This project stems from the United Nation’s Sustainable Development Goals (SDGs). The SDGs are a set of 17 goals that aim to end poverty, fight inequality, and stop climate change. Specifically, this project focuses on Global Goal #4: Quality Education, with a focus on comparing elementary mathematics pedagogy.

In this project, teams of students investigate the math readiness of elementary students within their community by comparing data sets to that of Singaporean students who consistently score higher on international comparisons of math knowledge. They then compare the Singaporean math curriculum to that of elementary schools in their town, examining which is more effective. Student teams create an action plan to improve math performance for their community based on their findings.

Goals

- Students will gain an understanding of the United Nations Sustainable Development Goals (SDG) initiative and develop empathy for other cultures.
- Students will acquire the skills necessary to research factors impacting global education.
- Students will develop solutions to a complex real-world problem.

Objectives

- Research math readiness and math performance of elementary students in your community.
- Research math readiness and math performance of elementary students in Singapore.
- Analyze and evaluate multiple data sets.
- Contextualize data by considering cultural norms, variables, and systemic differences.
- Draw conclusions based on thorough research.
- Develop action steps to improve math performance in your community based on data and research.
- Present findings and suggestions and convey reasoning to an authentic audience.

SCENARIO OR PROBLEM: What scenario or problem will you use to engage students in this project?

How can we improve the math outcomes of all elementary students in our community? Your team has been tasked with investigating the differences and similarities between math curricula in our elementary schools to that of elementary students in Singapore. After analyzing the differences, you must create an action plan for elementary math readiness in your community and share your recommendations for effective math teaching strategies with district administrators, local school officials, and elementary teachers. Be sure your presentation includes both qualitative and quantitative data and uses a digital media platform to enhance the understanding and interest of the audience.

Essential Questions

- How could access to quality education improve the lives and well-being of the global population?
- How do educational systems around the world compare to one another?
- What does academic performance data tell us about instruction? What does it not tell us?

Grade Level Adaptations

For upper-grade levels, you might consider requiring students to determine the statistical significance of several instructional approaches to justify any conclusions they have made.

ASSESSMENT: How will you determine what students have learned? (Check all that apply.)

FORMATIVE		SUMMATIVE	
Quizzes/Tests		Multiple Choice/Short Answer Test	
Notes/Graphic Representations	X	Essay Test	
Rough Draft		Written Product with Rubric	
Practice Presentation	X	Oral Presentation with Rubric	
Preliminary Plans/Goals/Checklists of Progress		Other Product or Performance with Rubric	X
Journal/Learning Log		Self-evaluation or Reflection	
Other:		Evaluation by Authentic Audience	X
		3D Model	X
		Other:	

MATERIALS, RESOURCES, or CONSTRAINTS: What materials and resources will be needed? Are there any perceived challenges?

Materials:

- Computers with internet access
- Local elementary math data (e.g., standardized test results, curriculum overviews, etc.)
- Student journals

Internet Resources:

- [U.N. Sustainable Development Goals](#)
 - [Goal #4: Quality Education](#)
- Global Partnership for Education’s article “[Five Ways Education can Help end Extreme Poverty](#)”
- [Common Core State Standards](#)
- Amanda Morin’s article, “[Singapore Math Pros and Cons](#)” (*VeryWell Family*)
- Richard Garner’s article, “[Singapore-style Teaching Helps Solve Problem of Maths Failure, says new Research](#)” (*Independent*)
- [Singapore Math Inc.](#)
- Mark Keierleber’s article “[Six Reasons Why Singapore Math Might Just Be The Better Way](#)” (*The 74*)
- Jeevan Vasagar’s article, “[Why Singapore’s Kids are So Good at Maths](#)” (*Financial Times*)
- OECD, “[PISA 2015 key findings for Singapore](#)” (check for updated findings for 2018 in December of 2019).
- Video Resources:
 - United Nations Foundation’s video, “[A Look at the Sustainable Development Goals](#)” (1:00) An introduction to the 17 Sustainable Development Goals from the United Nations Foundation.

Possible Constraints & Solutions:

- Ensure all student data privacy protections are known and adhered to.

SUPPORT, MODIFICATIONS, AND EXTENSIONS: What is needed to provide support for students who have difficulty learning the content, modify for students with special learning needs, or to provide enrichment for advanced students?

Support & Modifications:

For students in need of support, provide templates for research and reflection. You might use any of the resources from the Buck Institute for Education (BIE). BIE is a nonprofit organization that creates, gathers, and shares high-quality problem/project-based learning instructional practices and products to support teachers and districts. BIE provides a wide range of resources for problem/project-based learning. You can access those resources at <http://www.bie.org/resources>.

CALENDAR OF MAJOR LEARNING ACTIVITIES: What are the learning activities or tasks for each day? Are there any project milestones? When will formal assessment activities occur?

Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
<p>Initiating: Lead lesson and discussion focused on building awareness for SDG #4.</p>	<p>Initiating: Lead a discussion on mathematics, comparing the local community’s math curriculum to the Singaporean curriculum. How are they similar? How are they different? How might cultural differences and educational policy affect outcomes?</p>	<p>Initiating: Lead a discussion where students generate questions and challenge assumptions. Facilitate a discussion and record questions for continued research.</p>	<p>Initiating: Invite local teachers to attend a question and answer session with the class to better understand the community’s math curriculum.</p>	<p>Initiating: Host a video conference with math teachers from Singapore. Encourage students to ask questions that explore the similarities and differences between the curricula.</p>

Week 2

<p>Initiating: Gather local mathematics data from local sources as well as international data for Singaporean students. Analyze</p>	<p>Initiating: Form teams of students and challenge the teams to create a visual display that compares and contrasts the local math curriculum and the Singaporean math curriculum. Displays</p>	<p>Planning: Armed with research, data, and information, student teams brainstorm possible action steps to improve the local elementary math curriculum.</p>	<p>Planning: Students determine their finalized action plans, justifying their suggestions with data and anecdotal evidence. Students submit a brief summary of their recommendations.</p>	<p>Planning: Students strategize how to best share their action plan. Students consider digital media platforms (e.g., PowerPoint, Prezi, Video, etc.) and choose a means of communicating</p>
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the data sources and make comparisons.	should include data as well as observations. Have them share their visual with the class <i>Formative assessment opportunity</i>		<i>Formative assessment opportunity</i>	that enhances their message. Students plan out how best to deliver their message by considering their audience (i.e., teachers, administrators, school board, etc.).
Week 3				
Executing: Students are given work time to create their presentations.	Executing: Students are given work time to create their presentations.	Executing: Students are given work time to create their presentations.	Executing: Students are given work time to create their presentations.	Executing: Students are given work time to create their presentations.
Week 4				
Executing: Students deliver their presentation for the classroom as a practice round. Teacher and students provide feedback highlighting positives and making suggestions for improvement. Student teams consider feedback and make improvements. <i>Formative assessment opportunity</i>	Executing: Students deliver their presentation for the classroom as a practice round. Teacher and students provide feedback highlighting positives and making suggestions for improvement. Student teams consider feedback and make improvements. <i>Formative assessment opportunity</i>	Executing: Students deliver their presentation for the classroom as a practice round. Teacher and students provide feedback highlighting positives and making suggestions for improvement. Student teams consider feedback and make improvements. <i>Formative assessment opportunity</i>	Closing: Students deliver action plan presentations to their authentic audience. <i>Summative assessment opportunity</i>	Closing: Students deliver action plan presentations to their authentic audience. <i>Summative assessment opportunity</i>

STUDENT REFLECTION ACTIVITIES: How will students reflect on their work? Add reflection questions and/or activities here.

Student Reflection Questions/Stems:

- Edutopia — [Sample Reflection Questions](#)
- Buck Institute for Education — [My Thoughts About the Project](#)

Reflection Activities:

- Using a site like [Flipgrid](#), allow students to post video reflections of their work and development.
- Guide summary activities at the end of research days such as:
 - Two Dollar Summary: Students write summaries of what they learned, but each word is worth ten cents.
 - Gallery Walk: Students write or draw what they learned on large sheets of paper then walk through the gallery reading each other's charts.

Global Issue Overview Adapted from:

- “Sustainable Development Goals: Goal 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for all,” 2018, New York: The United Nations. Retrieved from <https://sustainabledevelopment.un.org/sdg4>
- “Unit Planning Template” by the Southern Regional Education Board, n.d., Atlanta: Southern Regional Education Board.

Works Cited:

- Global Partnership for Education. (2019). *Global partnership for education*. Retrieved from <https://www.globalpartnership.org/>