

STEM in our Lives, Families and Communities

LaCuKnoS Language Booster

As we look around our communities, our neighborhoods, and our families, it's easy to see local problems that need fixing. Maybe we see homeless people living on the streets and wonder how we might help them meet their basic needs. Maybe we see air conditioners or big trucks running all day and worry that our energy systems are contributing to climate change and increased risk of natural disasters. Or maybe we worry about the impacts of human expansion and the effect it has on local ecosystems and food production. Many of us will just go on with our daily lives trying to ignore these problems. But more and more, young people across the United States and around the world are trying to learn about and improve these local problems. Young people are using their science, technology, engineering, and mathematics (**STEM**) knowledge and skills to improve people's lives. [Here's a video](#) about one real life example from Malawi and another [from the U.S.](#)



So, how should we think about STEM in our lives? How do our families already use STEM knowledge and skills to understand things and to make decisions? Where can we learn and practice these skills? STEM education goes beyond the standards and concepts we learn in school. We can learn about STEM from out of school programs (like SMILE), from our families, businesses, and other community organizations. Working together, as a community, we can gain new knowledge, skills and opportunities that can help us think and act in ways that can improve our communities and our planet.

Learning more about STEM topics can help us make good decisions. Learning STEM skills can also prepare us for the jobs and **careers** of the future. The U.S. will need over 1 million new STEM workers in the coming decade with the **job skills** needed for a changing world. We will only meet this need through **broadening participation** from groups, such as women, rural communities, and people of color, who have traditionally been underrepresented in STEM education and STEM careers. In this lesson you will learn more about STEM jobs and skills, and why a STEM career may give you high **job satisfaction**.

Talk with a partner, then write your answer to these questions:

1. What is one thing about your community or your school that you would like to change?
2. What would you need to know or be able to do to help change this thing?
3. Name one or two jobs you are interested in. Do you think these jobs involve STEM?



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LaCuKnoS Science Investigation

The following LaCuKnoS investigation will help you think about jobs, skills, and where those skills are needed in our communities. Part of this activity will be done in your SMILE club and part will be done at home with your family.

Part 1 (In your SMILE Club) - STEM Careers Cards Activity

This activity will give you background on STEM careers and skills. We will think about the following topics:

- Job satisfaction
- Changing job opportunities
- STEM Skills and jobs

In small groups you will play the STEM Careers Card game. This card game has several parts to help you think about jobs in different ways.

Part 1A - Job satisfaction card activity (blue cards)

Finding a job that makes you happy or satisfied can be difficult. You need to know yourself, your interests, and the skills you are willing to work hard to develop and use. For most people there are a few important things that influence their job satisfaction. You will explore the idea of job satisfaction in the first part of this activity.

Procedure

1. You will get 6 job satisfaction cards (blue cards) from your teacher. The cards are about general characteristics of jobs that many people think are important to be happy and successful in a job.
2. Read the cards and arrange them in order from what is the most important for you to what is the least important to you when you think about a job that will make you happy. This is your opinion – there is no right or wrong answer.
3. Then, talk with a partner about why you put your cards in the order you did.
4. Write your answer to the following question: The two most important things for me to be satisfied in a job are: _____ and _____ because _____

(Job satisfaction cards are at end of lesson)

Part 1B - High growth and low growth jobs (pink cards)

Job satisfaction is important, but you also need to think about the future of the jobs you are interested in. Some types of jobs are growing fast and other types of jobs are disappearing. There will be many more opportunities in some jobs and much less opportunity in other jobs by the time you are ready to start your career. You will use the pink cards and work with a partner to think about high growth and low growth jobs.

1. The pink set of cards has 10 jobs. 5 of these jobs are fast growing jobs with lots of opportunities in the next decade. The other 5 jobs are disappearing and will be harder to get in the future.
2. Work with your partner to sort the cards into 2 piles – the ones you think are growing and the ones you think are disappearing. Talk about why you think that.
3. Answer the following questions:
 Something the high growth jobs have in common is _____
 Something that the disappearing jobs have in common is _____

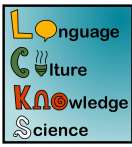
(High and Low Growth Job Cards are at end of lesson)

Part 1C - Skills needed for STEM jobs (yellow cards)

Different jobs require different skills. What skills are you interested in learning and practicing? This is another way to think about jobs that could be a good fit for you. You will use the pink cards with job descriptions again. You will add the yellow cards with job skills to match skills with jobs that require those skills.

4. The 6 yellow cards have job skills that are important for some of the jobs (pink cards) you talked about in part 1B.
5. Work with your partner or small group to match each skill with the job or jobs that you think needs that skill the most. (there can be more than one correct answer)
6. Talk more with your partner and then answer the following questions:
 One skill that I am interested in learning more about is _____ because _____.
 With this skill, one good job choice for me could be _____.

(Job skills cards are at the end of lesson)



Part 2 (To take home) – Telling Family STEM stories

Storytelling is an important part of family life. Families share stories about life experiences as a way to create shared understandings that are passed on from one generation to the next. This activity will help you think about the role of STEM in your family story.

You will do part 2 of the STEM careers lesson at home. You will have several weeks to complete part 2, and then we will share with each other in your SMILE club.

You will start by asking a few questions to people in your family to gather information about STEM in their lives. You need to ask these questions to at least one person, but more is better!

Questions to ask your family about STEM (science, technology, engineering, and math) in their lives:

1. When you were growing up, what were you curious about that involved science, math or technology? Why were you curious?
2. Who is someone our family knows that does work that involves science, math or technology? How is science, math or technology part of what this person does?
3. In our family, what are some things we do that involves science, math or technology? How is science, math or technology part of this?
4. What are some of the needs or challenges that you think we have in our community?
5. How can science, math and technology help to address these needs or challenges in our community?
6. Do you think I should keep studying science, math and technology subjects in school? Why or why not?

Next, you will complete the family STEM story page based on what you learned from asking these questions.

- You can use the Family STEM story handout from your teacher or you can create your own one-page story.
- You can use words, pictures, drawings, collage and any other creative ways of telling your family STEM story.

Part 3 (In SMILE Club) - Share your family STEM story with your club and combine into SMILE club STEM story

1. Take turns presenting your Family STEM story to your SMILE club.
2. Add your page to the binder to help create your SMILE Club STEM story.
3. You will share this SMILE Club STEM story with your families at your Family STEM Night.
4. Complete the LaCuKnoS student survey – the survey is about your experiences and interests in STEM and STEM careers. There are no right or wrong answers but we really care what you think
5. about these questions so please answer with what is true for you.

The _____ Family STEM story

Past family
connections to
STEM

STEM in our community
today

Ways that STEM can benefit our
family and community

The role of STEM in my own
future

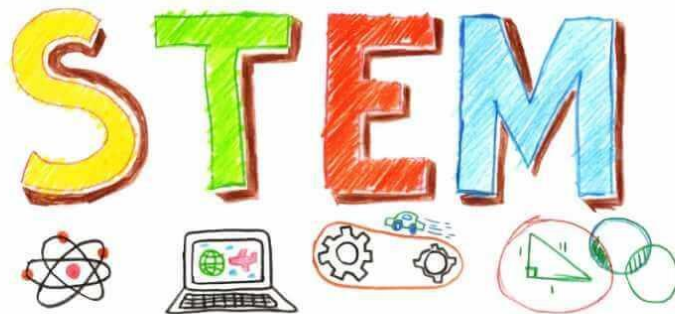
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LaCuKnoS Concept Cards

STEM/ STEM

The acronym for science, technology, engineering and mathematics.

El acrónimo en inglés de ciencia, tecnología, ingeniería y matemáticas.



STEM skills and STEM careers will become increasingly important in the next decade.

Concept Card

Career/ Carrera

The type of work a person chooses to do throughout life.

El tipo de trabajo que una persona elige hacer a lo largo de su vida.



She decided to study for a career in engineering.

Concept Card

Job Skill/ Habilidad para el trabajo

The ability to perform a task that is required for a certain job.
Skills need to be learned and practiced.

La habilidad para realizar una tarea que se requiere para un trabajo. Las habilidades necesitan ser aprendidas y practicadas.



Job skills can be learned in school, from training programs, or on the job.

Concept Card

Job Satisfaction/ Satisfacción laboral

How happy or content a person is when they are doing a certain job.

Qué tan feliz o contenta está una persona cuando está haciendo un trabajo.



Marta found that working as a physical therapist gave her a lot of job satisfaction.

Concept Card

Broadening Participation / Ampliación de la participación

Efforts to include a wider range of people in an activity that has traditionally excluded certain groups.

Esfuerzos para incluir una gama más amplia de personas en una actividad que tradicionalmente ha excluido a ciertos grupos.



Broadening participation in science will be necessary to meet the job demands for the future.

Concept Card

Extension activity – Scientist Stories

Many people have stereotypes about scientists based on the images we have seen of scientists in the news, in movies and books and on TV. We tend to think of scientists as older white men with glasses and messy hair, wearing white coats and working in a lab on complicated experiments. While some scientists do fit this stereotype, many more scientists do not. Today, scientists are all kinds of people, working in all kinds of places, doing a wide variety of things. There are now many books for young people that tell interesting stories about the wide range of work that scientists do and the wide variety of people who do this work.

The following links are to video readings of some of these books. We also have copies of these books that we can loan to SMILE clubs.

Scientist Stories list: (grades ~ 4-8)

- * *The boy who harnessed the wind* <https://www.youtube.com/watch?v=xfmM6Hqi9yc>
- * *Annie Jump Cannon, Astronomer* <<https://www.youtube.com/watch?v=iBOI5E5vfcM>>
- * *Ada Byron Lovelace and the Thinking Machine* <https://www.youtube.com/watch?v=Kv-Hfaws2aQ>
- * *Who Says Women Can't Be Doctors? The Story of Elizabeth Blackwell*
https://www.youtube.com/watch?v=9A23aQZ_Ilc
- * *The Boy Who Invented TV: The Story of Philo Farnsworth*
<https://www.youtube.com/watch?v=adE-m9lWnms>
- * *The Real McCoy: The Life of an African-American Inventor*
<https://www.youtube.com/watch?v=V1fcvTYGTck>
- * *Seeds of Change: Wangari's Gift to the World* <https://www.youtube.com/watch?v=NWFdmOaDTxE>
- * *Life in the Ocean: The Story of Oceanographer Sylvia Earle*
<https://www.youtube.com/watch?v=Q6-KyVZvjMM>
- * *Manfish: A Story of Jean Jacques Cousteau* <https://www.youtube.com/watch?v=YCZO83Y6KUE>
- * *The Watcher: Jane Goodall's Life With the Chimps* <https://www.youtube.com/watch?v=8flyo1q7oRk>

- * The girl who thought in pictures <https://www.youtube.com/watch?v=icruLjS0PJY>
- * Shark Lady https://www.youtube.com/watch?v=A5jDI_mVFTw
- * Margaret and the Moon <https://www.youtube.com/watch?v=telH4l3f92Q>
- * Mr. Ferris and His Wheel https://www.youtube.com/watch?v=Sfqkdq_q7qQ
- * A Passion for Elephants: The Real Life Adventure of Field Scientist Cynthia Moss
<https://www.youtube.com/watch?v=fCvv8mfB9qY>
- * One Plastic Bag: Isatou Ceesay and the Recycling Women of Gambia
<https://www.youtube.com/watch?v=7JHesyYfeE>
- * The Fossil Girl: Mary Anning's Dinosaur Discovery <https://www.youtube.com/watch?v=-eNAyLmJQKE>
- * To the Stars! The First American Woman to Walk in Space
<https://www.youtube.com/watch?v=IWxzM9vUwjc>
- * Tree Lady <https://www.youtube.com/watch?v=ALO6edKwj4U>
- * *Secret Engineer: How Emily Roebling Built the Brooklyn Bridge*
https://www.youtube.com/watch?v=ZsKBCi76m_I
- * The Secret Subway https://www.youtube.com/watch?v=_4OH4O8VaXs
- * *The Dinosaurs of Waterhouse Hawkins* <https://www.youtube.com/watch?v=rH51tuuBXZs>
- * *Gregor Mendel: The Friar Who Grew Peas* <https://www.youtube.com/watch?v=2BZIsIffCRs>
- * *Papa's Mechanical Fish* <https://www.youtube.com/watch?v=-9aOf-HPTaw>
- * *A Picture Book of George Washington Carver* <https://www.youtube.com/watch?v=1dJT6FpoQJA>
- * *Rachel Carson and Her Book That Changed the World*
https://www.youtube.com/results?sp=mAEB&search_query=Rachel+Carson+and+Her+Book+That+Changed+the+World
- * *Electrical Wizard: How Nikola Tesla Lit Up the World* https://www.youtube.com/watch?v=q_cT4kX9zaw



* *Star Stuff: Carl Sagan and the Mysteries of the Cosmos*

<https://www.youtube.com/watch?v=jX8t9lfHJTM>

* *Starry Messenger: Galileo Galilei:* <https://www.youtube.com/watch?v=UWLTdyArEbU>

* *Barnum's Bones: How Barnum Brown discovered the most famous dinosaur*

<https://www.youtube.com/watch?v=Cy1sFrw7Pk8>

* *Snowflake Bentley* <https://www.youtube.com/watch?v=rtyLpo3cWic>

* *The Man who named the clouds* <https://www.youtube.com/watch?v=tbcpiiF2FfA>

* *The Boy who drew birds* <https://www.youtube.com/watch?v=NQevGPnyNsE>

Work Tasks

What is a typical day like? What does someone with this job do? Physical work? Mental work?



Salary & Promotion

How much money are you likely to get paid to do this job? At the start? After a few years?



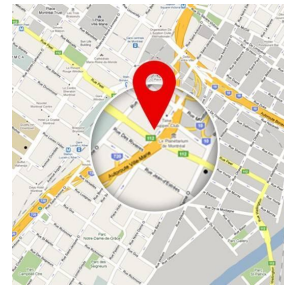
Safety

How safe is it to do this job and what are the risks?



Location

Where is this job common? Where do you need to live or go to do this job? Indoor or outdoor? Office? Traveling?



Co-workers

Who do you work with, what are they like, many people or few or alone?



Contribution

How does this job make the world a better place (contribute to society)?



Wind or Solar Technician

installs, maintains and repairs wind turbines or solar panels



Cashier

receives payment and provides customer service in stores and businesses



Factory worker

builds and makes things like cars or clothing or toys in factories



Nurse

provides health care to people in a range of settings



Information technology specialist

installs, maintains and troubleshoots computer systems, networks and databases



Taxi / Uber/ Lyft driver

picks people up and drives them where they need to go



Travel agent

helps customers plan and arrange trips, finding flights, hotels, etc.



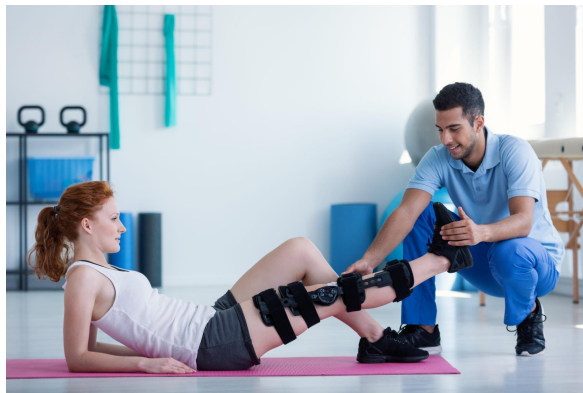
Statistician

analyzes data to solve problems and make decisions in a range of fields such as business, health care, government and technology



Physical or occupational therapist

works with injured or ill people to help them recover physical abilities and skills they have lost



Bank teller

helps customers deposit or withdraw money and does other tasks in a bank



Health Services Manager

Plans and coordinates medical services in a hospital or doctors office



Data analysis

working with large amounts of data to see patterns and make conclusions



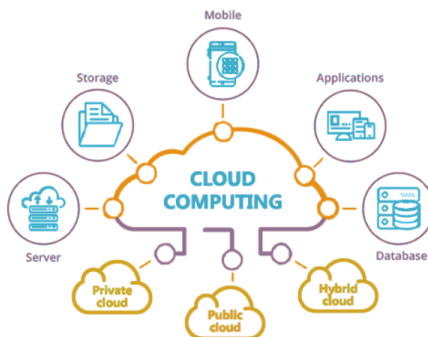
Multilingual/ multicultural communication

communicating effectively with people from different backgrounds, cultures and experiences



Cloud computing

understanding and managing how data and apps are stored, organized, secured and accessed in a distributed way on the internet



Collaborative planning and decision making

working well with other people to make plans and decisions that balance different needs



Time management

organizing and planning how to divide up time among activities that need to be done



Creativity and problem solving

thinking about a problem in more than one way and comparing the advantages and disadvantages of possible solutions



Questions to ask your family about STEM (science, technology, engineering and math) in our lives & community:

1. When you were growing up, what were you curious about that involved science, math or technology? Why were you curious?
2. Who is someone our family knows that does work that involves science, math or technology? How is science, math or technology part of what this person does?
3. In our family, what are some things we do that involves science, math or technology? How is science, math or technology part of this?
4. What are some of the needs or challenges that you think we have in our community?
5. How can science, math and technology help to address these needs or challenges in our community?
6. Do you think I should keep studying science, math and technology subjects in school? Why or why not?

Preguntas para hacerle a su familia sobre la ciencia, la tecnología, la ingeniería y las matemáticas (STEM, por sus siglas en inglés) en nuestras vidas y la comunidad:

1. Cuando estabas creciendo, ¿sobre qué tenías curiosidad acerca de las ciencias, las matemáticas o la tecnología? ¿Por qué tenías curiosidad?
2. ¿Quién es alguien que nuestra familia conozca que trabaje en ciencias, matemáticas o tecnología? ¿De qué manera la ciencia, las matemáticas o la tecnología forman parte de lo que hace esta persona?
3. En nuestra familia, ¿cuáles son algunas de las cosas que hacemos que involucran ciencia, matemáticas o tecnología? ¿Cómo es la ciencia, las matemáticas o la tecnología parte de esto?
4. ¿Cuáles son algunas de las necesidades o desafíos que crees que tenemos en nuestra comunidad?
5. ¿Cómo pueden las ciencias, las matemáticas y la tecnología ayudar a abordar estas necesidades o desafíos en nuestra comunidad?
6. ¿Crees que debo seguir estudiando materias de ciencias, matemáticas y tecnología en la escuela? ¿Por qué si o por qué no?