

Leadership Curriculum

Lesson 1

Introduction

Lesson Overview:

Students will begin the Leadership Curriculum by completing the following steps: 1) identifying the skills and qualities needed to be a leader in your career 2) identifying their personal strengths and weaknesses as leaders 3) research three young leaders in their professions and choose one to receive a prize

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Leadership

Lesson 1 – Introduction to Leadership

Lesson Overview:

During the first part of this lesson, you will guide students to identify the qualities and skills that define a good leader and help students to evaluate their own strengths as leaders as well as to identify leadership skills and qualities students hope to develop and improve. In the second part of the lesson, students will research three young leaders from STEM professions and draw on what they learned in Part 1 to choose one leader for an award.

Time Frame:

2-3 hours, including time for students to complete independent work

Core Concepts:

- Good leaders share certain skills and qualities.
- By understanding what defines a good leader, you can develop and improve your own leadership traits.

Lesson Objectives:

In this lesson students will:

- Identify the skills and qualities needed to be a leader in a STEM profession.
- Identify their strengths as a leader and target leadership skills and qualities they want to develop further.
- Research three young STEM leaders and choose one to win a prize.

Materials Needed:

- [Leadership Skills slideshow \(including Young Leaders slideshow\)](#)
- Online leaderships surveys (see pg. 6 of this lesson plan for example surveys)
- Leadership Skills Progress worksheet

Supplemental Videos

- [Skills of a STEM Leader](#)

Introduce the Leadership Module

Explain to students that good leadership skills will help them succeed in any course of study and career they choose to pursue, and especially in STEM fields. Tell them that the lessons in this Module are designed to help them learn more about what makes a good leader, what is involved in being a leader in the STEM world, and how to develop and improve their leadership skills.

Explain that as students work through each lesson in the Module, they will complete an activity such as writing a profile of a STEM leader who inspires them. They will discuss their work with you and with each other, and will share ideas and resources related to leadership.

Part 1: Spotlight on Leadership Skills

Step 1: Activate Background Knowledge

Ask students: *What is the most important skill or quality a good leader can have?* Invite several volunteers to share their ideas, and list students' responses on the board. Revisit the list during and after the Leadership Skills slideshow to add, delete, and revise ideas.

Step 2: Present the Introduction to Leadership Slideshow.

Be sure to pause after each slide to solicit questions and comments from students. (See suggestions within the slideshow.)

[Slide 1]

Exploring Leadership Skills and Qualities

There are two ways of spreading the light: to be the candle or the mirror that reflects it. ~ Edith Wharton, Pulitzer Prize winning writer

What does it take to be a leader in general, and specifically in STEM fields? Most likely, everyone you ask will have a slightly different opinion. But here are nine skills and qualities most people would agree a leader needs for success – whether as the candle or the mirror.

[Slide 2]

Confidence

The first step toward being a good leader is believing that you can do it. Good leaders are unafraid to take action when they have a good idea and to step in and lead the way in situations in which leadership is needed.

As Sheryl Sandberg, Chief Operating Officer at Facebook says, "no one gets to the corner office by sitting on the side, not at the table, and no one gets the promotion if they don't think they deserve their success."

Communication

Communication is key to the success of any project or plan. A good leader communicates important ideas and information effectively to partners and team members. Good leaders also listen carefully to others' ideas.

According to author and presidential speechwriter James Humes, "The art of communication is the language of leadership."

Self-Awareness

A good leader knows and understands her or his own strengths and abilities, and contributes a unique voice to any project. Good leaders recognize when they need to seek advice or delegate a responsibility to someone else.

Pause to Ask: Were you surprised by any of the skills so far? Do they match the skills we listed on the board?

[Slide 3]

Team Building

Good leaders are skilled at assessing team members' strengths and abilities, and know how to build a well-rounded team of people who work effectively and respectfully together.

Mellody Hobson is the president of Ariel Investments, one of the largest African-American owned money management firms in the US. What's her advice on building a strong team? "Invite people into your life who don't look like you, don't think like you, don't act like you, don't come from where you come from, and you might find that they will challenge your assumptions and make you grow" she says.

Relationship Building

On a related note, good leaders are also skilled at building strong, productive relationships with partners and colleagues outside their own team, department, or company.

Roselinde Torres is a senior partner and managing director at the consulting firm, BCG. Torres took a year off from her job to travel the world, studying what makes people effective leaders. She says it is important to build a diverse network of colleagues: "Great leaders understand that having a

more diverse network is a source of ... solutions, because you have people that are thinking differently than you are.”

Conflict Resolution

Even the strongest teams and relationships will experience occasional clashes between people and ideas—and sometimes, that can be a good thing! Research has shown that conflict and disagreement among team members often leads to more creative solutions than unanimous agreement. Good leaders are skilled at managing disagreements peacefully and productively, and even using conflict to improve a project.

In Bani Usef, a remote rural area of Yemen, a young woman named Katiba heads up the local Community Development Council. She has used her skills and training in conflict resolution to get the local health clinic reopened, updated, and improved after a conflict with the district Health Office, and to secure free classroom space for students once forced to study in the open air. “You can imagine what a huge impact we achieved,” Katiba says.

Pause to Ask: Do you understand the skills presented so far? Does anyone have questions?

[Slide 4]

Problem Solving

Good leaders respond quickly and effectively when a problem arises, finding creative solutions that not only eliminate the problem, but use it as an opportunity to make improvements and strengthen processes or products.

Later in this lesson, you will read about three teenage STEM leaders who saw problems around them and invented new solutions.

Flexibility and Risk Taking

Some projects won’t go the way you expected and planned. Good leaders are able to adjust processes, strategies, and goals accordingly, even when the new plan seems risky.

According to Roselinde Torres, to be a good leader, you must be “courageous enough to abandon a practice that has made you successful in the past. ...Great leaders dare to be different. They don’t just talk about risk-taking, they actually do it.”

Resilience

Everyone will experience setbacks and failures in their education and careers. Good leaders are distinguished by their ability to keep going, try new strategies, and learn from failures and mistakes.

Pause to Ask: How did these skills match up against the skills we listed on the board? Let's revisit. Can anyone share a story about a time you used one of these skills?

Step 3: Students Assess Their Leadership Skills

As they viewed the Leadership Skills slideshow, students may have seen skills that they already have or are developing, as well as other skills that they want to develop in the future. They may also have identified areas of weakness for which they hope to compensate by developing other strengths.

Invite students to explore their leadership skills and strengths by taking one or more of the following quizzes, during class or as homework.

- [Leadership Test](http://www.psychometrictest.org.uk/leadership-test/) [http://www.psychometrictest.org.uk/leadership-test/]
- [Learn More About Your Leadership Style](https://www.verywell.com/whats-your-leadership-style-3866929) [https://www.verywell.com/whats-your-leadership-style-3866929]
- [What Sort of Leader Are You?](http://www.skillsyouneed.com/ls/index.php/325444) [http://www.skillsyouneed.com/ls/index.php/325444]

When everyone has completed a quiz, ask partners to Think-Pair-Share to respond (orally or in writing) to the following question:

- In your opinion, did the quiz(es) you took accurately capture your skills and strengths? Why or why not?

Then convene the whole class and invite several pairs to share their responses. Encourage the class to discuss students' responses.

Step 4: Students Complete the Leadership Skills Progress Worksheet (30-60 minutes)

Distribute the Leadership Skills Progress Worksheet. Ask students to complete it to identify their current leadership skills and strengths, and to set goals for developing new leadership skills and qualities. Remind them to consider the skills and qualities discussed earlier in the lesson, as well as those that came up in the online quizzes students completed.

When students have completed their worksheets, set aside a few minutes to meet with each student. Use these points to help guide your discussion:

- Do you agree with the student's self-assessment?
- Does the student demonstrate mastery of a skill? Has the student demonstrated growth in a skill with opportunities for continued development?

- What other ways would you recommend for the student to continue developing leadership skills?
- What kind of leadership skills can you help the student to develop? Can these skills be written into the student's goals?
- What other questions or concerns does the student have?

Part 2: Spotlight on Young STEM Leaders

Step 1: Present the Young Leaders Slideshow

Present the slideshow, explaining that later each student will get to select the leader whom s/he believes is most deserving of an award. Spend some time exploring the links on each slide as a class, or ask students to do so independently.

[NOTE: The ages listed in the slideshow reflect each young leader's age when she or he built the invention to be discussed.]

[Slide 5]

Each of the young STEM leaders below invented a new way to generate power and light. Now, they are up for an award in their field—and you get to be the judge.

[Slide 6]

Meet the candidates for our class leader awards!

Discover more about each candidate on the following slides. Feel free to do further research if you want to know more.

Eesha Khare – 17 years old – Saratoga, California, USA

Ann Masokinski, 16 years old – Victoria, Canada

William Kamkwamba – 14 years old – Dowa, Malawi

[Slide 7]

Eesha Khare

Eesha, 17, of Saratoga, California invented the supercapacitor, a tiny battery-like energy storage device that can fully charge in just seconds and hold a charge for a long time.

Learn more:

[Teen's invention could charge your phone in 20 seconds](#)

[Charge Your Phone in 20 Seconds - Eesha Khare's Invention](#)- Watch this short video to find out more about supercapacitors and how Eesha's invention could make a huge difference through more efficient energy storage.

[Eesha's TED Talk](#)- Learn about Eesha's invention and her science and engineering processes directly from the inventor, herself!

[Slide 8]

Ann Masokinski

Ann, 16, of Victoria, Canada, invented a flashlight powered by the heat of the user's hand.

Learn More:

[Unleashing the Thermoelectric Power Inside of You](#)

[Ann's TED Talk](#)- Ann shares her personal motivation behind her invention, her invention process, and what came next.

[Slide 9]

William Kamkwamba

At 14, William used information he learned from library books to build a windmill from spare parts and scrap metal, bringing electricity to his rural village.

Learn More:

[William's website](#)- Discover what William is doing today to help people in villages like his.

[How to Build a Windmill](#) (William's TED talk)

[William and the Windmill](#) documentary

[Slide 10]

When you have learned about each candidate, consider the following questions.

1. What did this young leader invent?
2. How did the leader get the idea for the invention?

3. How did the leader's background, personality, and education contribute to her/his inspiration?
4. What leadership skills helped each leader to think of and execute her/his idea?
5. What problem did the invention solve?
6. Whom does the invention help?
7. What is creative and innovative about the invention?
8. What are the advantages and disadvantages of the invention?
9. How successful is the invention?

Step 2: Discuss

Ask whether students have any questions about the candidates, providing answers and clarification as needed. Then display the questions from slide 10. Make time for a class discussion of the questions, or ask students to respond to the questions in pairs or small groups, then convene the whole class to share and discuss responses.

Step 3: Take a Show of Hands Poll!

Invite students to vote for the young STEM leader who most deserves a prize. State the name of each invention and ask students to raise their hands for the invention of their choice. Then lead a class discussion of the poll results, asking volunteers to explain their choices. Alternatively, as time permits, you might ask each student to write a paragraph or two explaining his or her choice, then convene the whole class and invite volunteers to read and discuss their mini-essays.

RESOURCES

Share these resources for further research.

Leadership Skills

Learn more about leadership skills from the articles and TED talk below.

- [What is Leadership?](#)
- [What Do Women Leaders Have in Common?](#)
- [What You Think Makes a Good Leader Probably Doesn't](#)
- [What is 21st Century Leadership?](#)
- [Five Essential Skills for Leadership in the 21st Century](#) [
- Roselinde Torres: [What It Takes to Be a Great Leader](#) (TED talk)

Take Your Leadership to the Next Level

Are you looking for opportunities to build your leadership skills? Do you need some inspiration to come up with a great SMART Goal for the Leadership Skills Progress activity? There are lots of programs, internships, and courses available for students to build leadership skills (including the STEM Scholars!). Check out one or more of the following opportunities:

[Girl Guides and Girl Scouts](#) - global

[Boy Scouts of America](#) - US

[African Leadership Academy](#) - African continent

[Magic Moments Foundation - Youth Leadership](#) - Australia

[Red Cross Young Humanitarians Youth Leadership](#) - Australia

[Girls, Inc.](#) US and Canada

[Harvard Summit for Young Leaders in China](#)

[Community-The Youth Collective](#) - India

[Southeast Asia Youth Leadership Program \(SEAYLP\)](#)

[Girls Leadership](#) - US

[Envision](#)

[National Inventors Hall of Fame](#) - US

[National Youth Leadership Council](#) - US

[La Raza Youth Leadership Institute](#)

[Global Social Leaders](#) -UK & Ireland

[McKinsey Leadership Academy](#) - UK