



Choose  
Science!

# Middle School Activities and Teacher's Guide



- Spark and sustain enthusiasm for science
- Introduce leading scientists as role models
- Encourage scientific discovery and curiosity
- Inspire students to see that they can have STEM careers

**New!**  
Meet leading  
LLS researchers



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Middle School Activities  
and Teacher's Guide  
Women in Science  
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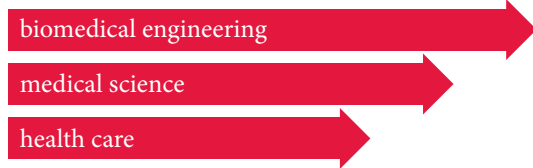
# Young children love science. But as kids get older, too often boys continue their love for science while many girls lose interest. Why?

Answering that question and addressing the need to keep all kids interested in science is more important than ever. Science, technology, engineering, and math (STEM) fields are growing faster than other occupations. **Current estimates predict that we'll need 1,000,000 additional STEM professionals in the next decade**—about the same time that many of your students will enter the workforce.



Here's a look at what's to come:

### Fields with maximum job growth



**1,000,000**

Number of additional STEM professionals needed in the next decade



Estimated size of the STEM workforce in the US



With the middle school projects and activities provided here, students will learn about female scientists who are leading the way to beat blood cancers. They'll see how women have made vital contributions to science throughout history, from winning Nobel Prizes to making breakthrough discoveries. They'll understand that STEM fields require creativity and problem solving. And they'll take on engaging projects sure to have a lasting impact.

# Try these tools to help engage all of your students in science:

**A Head and Heart for Science**

**Who?** **Dr. Susan H. Rosenberg**, M.D., M.P.H., is the President and CEO of the Leukemia & Lymphoma Society. She is also a professor of medicine at the University of California, San Diego. Dr. Rosenberg is a leader in the field of cancer research and has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**What's the Big Deal?** Dr. Rosenberg has spent her career working to improve the lives of cancer patients. She has led the development of many new cancer treatments, including the first targeted therapy for chronic myeloid leukemia (CML). She has also been instrumental in the development of the first CAR T-cell therapy for multiple myeloma. Dr. Rosenberg is a leader in the field of cancer research and has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**Star Trek Star**

Dr. Rosenberg is a fan of Star Trek. She has even appeared on the TV show. She has also been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**Hero Squad**

Dr. Rosenberg is a member of the Hero Squad. She has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

## Grade-appropriate passages introducing current female researchers and their groundbreaking work

Questions follow each passage to gauge comprehension and to get students making connections with their own interests and influences in science.

**A Creative Scientist Takes a Swipe at Cancer**

**Who?** **Dr. Jennifer Doudna**, Ph.D., is an American molecular biologist and geneticist. She is currently a professor at the University of California, Berkeley. Dr. Doudna is best known for her work on CRISPR-Cas9, a revolutionary gene-editing technology. She has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**What's the Big Deal?** Dr. Doudna's work on CRISPR-Cas9 has revolutionized the field of genetics. She has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**Strive for Excellence**

Dr. Doudna is a member of the Hero Squad. She has been instrumental in the development of many new cancer treatments. She is also a passionate advocate for cancer patients and their families.

**Hero Squad**

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## Grade-appropriate reading passages showcasing important female scientists throughout history

As students will see, women have played important roles in science through the ages. In fact, a woman was the first person to win two Nobel Prizes!

### Did you know?

Marie Curie was the first person to win two Nobel Prizes.

**CELL SCIENCE: A Science Exploration Project**

**What's So Important About Our Cells?**

Cells are the basic units of life. They are the smallest units of an organism that can live on their own. They are the building blocks of all living organisms. They are the units that make up the tissues and organs of the body. They are the units that carry out the functions of the body. They are the units that are responsible for the growth and development of the body. They are the units that are responsible for the repair and maintenance of the body. They are the units that are responsible for the transmission of genetic information from one generation to the next.

**Be a Science Investigator**

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## Eye-opening science exploration projects

Forget boring reports. These projects get kids learning about blood, bones, cells, the circulatory system, the immune system, and more with creative, flexible activities.



## Inspiring mini-posters to print and display

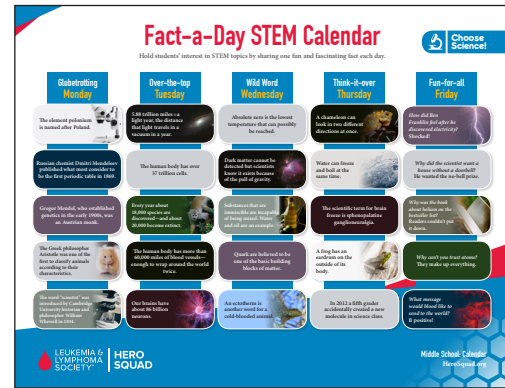
Put a face on science with these printable posters. Each features a quote from a female scientist and fun facts to serve as an ongoing reminder of the rewarding careers available in STEM.

## Invite scientists into your classroom

Meeting real scientists and hearing firsthand about their work can be a powerful, life-changing experience. Here's how to get started.

- Poll students' parents. No doubt parents, grandparents, cousins, and family friends have interesting jobs in STEM fields.
- Connect with local colleges and universities. Professors and researchers oftentimes are available to visit classes to talk about their work and share how they got their start.
- Contact the speaker's bureau or public relations office at your local hospital.
- Get in touch with professional organizations such as the American Association of University Women (AAUW), the National Society of Professional Engineers (NSPE), IEEE Women in Engineering, National Center for Women & Information Technology (NCWIT), and similar organizations active in your area.
- Explore online options. Skype in the Classroom provides virtual visits with professionals worldwide.
- Tap into local government. Your city or town employs engineers, actuaries, programmers, and planners whose work ties directly to STEM fields.
- Video clips are helpful too. Anytime you're adding video to a lesson, look for segments that show diverse scientists; that way all of the students in your class will see scientists who look like them.

Once you have a guest speaker lined up you'll want to make sure students get a lot out of the experience. Spend a little time familiarizing students with the speaker's topic. Ask each student to prepare 3-5 questions to engage the speaker and fuel the conversation. Then, after the talk, discuss with students what they heard and help students investigate new subjects that the speaker covered.



## Fun fact-a-day STEM calendar

Catch kids' interest with fascinating facts, wild science words, mind-blowing scientific numbers, and grin-inducing science jokes to end each week with a smile. They're perfect for science notebooks and daily thought starters to keep kids plugged into STEM.

## Planning with your speaker

Your speaker may have limited experience with student groups. Once the date for the visit has been set, discuss with your guest topics such as

- your goal for the visit and what you hope students will learn
- topics related to the speaker's field that students have studied and projects they've done
- special skills that you want students to know are involved in the person's job. For example, what part does creative thinking or problem solving play?
- a basic description of the types of activities the class responds to. For example, do they respond well to visuals or artifacts? Video clips? Q&A sessions? If your speaker is at all unsure, spend a few minutes brainstorming with him or her. Be careful not to use "teacher language" since your guest may not know what bell-ringer activities or exit tickets are.
- what technology your guest may need. If he or she will be bringing a laptop or tablet, make sure you have the correct cords, passwords, and other connections to ensure everything will work. Guests may not realize that popular websites like YouTube are blocked at some schools.



## Science show-offs

Show off your students' science exploration projects to your guest speakers. Getting insights, comments, and compliments from a scientist working in the field will be a memorable experience for students.

Looking for more chances to share students' work? Try these ideas (be sure students don't include personally identifiable information):

- Have students photograph or record their projects; then upload these clips to Google Photos or a similar media-sharing service. Invite parents to click around to see the fun and educational projects students have created.
- Contact a local coffee shop or other retailer about displaying projects in a store window or entryway. Hospitals, universities, libraries, and government buildings can be great places to display student work as well.
- Display the projects during PTA meetings, sporting events, plays, concerts, and other school events so your whole community can see—and learn from—students' creative efforts.

**Showing off students' projects invites positive reinforcement, encourages students to take pride in their work, and rewards them for diving deeply into a project. Projects like these can be key in encouraging all students' interest in science.**

Dear Family,

Young children love science. But as kids get older, too often boys continue their love for science while many girls lose interest. Why? Research provides lots of possible answers.

- Many girls have never seen or met a female scientist, engineer, programmer, mathematician, or researcher and they can't picture themselves in a job like that.
- Many girls see careers in STEM (science, technology, engineering, and math) as filled with calculations and experiments but with no potential for creative thinking or problem solving. (As it turns out, creativity is critical in STEM careers!)
- Many girls don't realize the wide-ranging positive impact of a STEM career (such as joining the fight to beat blood cancers).

Keeping all kids interested in science is more important than ever. STEM fields are growing faster than other occupations. **Current estimates predict that we'll need 1,000,000 additional STEM professionals in the next decade—about the same time that your children enter the workforce.**

Here are a few other interesting statistics:

Fields with maximum job growth

biomedical engineering

medical science

health care



This year we're using materials provided by **The Leukemia & Lymphoma Society** to introduce students to female scientists who are leading the way in beating blood cancers. Students will see how women have made vital contributions to science throughout history, from winning Nobel Prizes to making breakthrough discoveries. They'll learn that STEM fields require creativity and problem solving with the potential to make a huge positive impact. And they'll take on engaging projects with lasting impact.

I hope you'll encourage your child's interest in STEM as well.

- When you run into a friend who works in STEM, ask him or her to tell you a little about what their company does, what projects they work on, and when they got interested in science.
- Talk about how science, technology, engineering, and math factor into your day.
- Make time for local science festivals, speakers, or museum exhibits.
- Look up fascinating facts, simple experiments, or even science-related puns and jokes.
- Most of all, encourage your child to work hard to build the base knowledge needed for a STEM career if that's what he or she chooses down the road.

Please let me know what questions you have.

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(teacher's name)