Educate.Today
Innovate · Illuminate · Inspire

Using STEM in the Classroom
by Rhonda Proske

Rhonda Proske recently retired after 32 years of teaching in an elementary classroom.

Want to get your students more excited about learning? STEM education may be your answer. **S**cience, **T**echnology, **E**ngineering, and **M**athematics are taught interdisciplinary and students have the opportunity to see how the subjects are all related to each other. Students have the chance to work with others using an inquiry and hands-on approach. STEM education is a must with the majority of jobs in the future involving STEM knowledge. STEMconnector.org says in 2018 there was a need for 8.65 million workers in STEM related jobs. STEM careers are growing at 17% while others are growing at 9.8%.

STEM education involves all or some of these within a unit:

- asking thoughtful questions
- problem solving creatively
- using teamwork/collaboration with thoughtful dialogue
- inquiring and thinking through problems
- applying information
- working through real-life situations
- engaging different parts of kids' brains
- using different hands-on materials that not all kids may have had experience with at home, especially girls
- innovating and creating
- investigating global issues
- providing for purposeful love of learning.

Teaching STEM to younger students involves observations, asking questions, and exploring. For intermediate students, problem solving, using scenarios, and collaboration can be additional methods to show their thinking. High school students can also investigate and determine answers in a more sophisticated way.

As a teacher, are you thinking, how do I use STEM education when my textbooks don't all teach that way? As an elementary teacher starting to use STEM education a few years ago, I realized that all the theme teaching I did early in my career really helped me to begin to understand how I wanted the lessons to relate and build on each other. But with theme teaching, even though I thought all my lessons were fun and followed standards, they did not always show real-world application. So, I found some suggestions for beginning to create STEM lessons:

Educate.Today
Innovate · Illuminate · Inspire

1. reflect on what supplies you already have
2. modify your questioning and language using words like design, model, and experiment (ask which lessons could be presented as a problem or question
3. encourage problem solving, and 4) provide for trial and error and collaboration.

I needed to learn and use the engineering design process. This process is given different amounts of steps in several different websites, but I liked these:

1. identify the problem,
2. do research
3. generate different solutions
4. choose the best solution
5. create a model
6. test and evaluate
7. redesign.

I also have included one from www.sciencebuddies.org below.

Designing a STEM unit involves preparing around a topic you will be teaching while connecting it to a valid, real-world problem that is open-ended and one the students can relate to. I needed to define the question and define what success would look like. I also needed students to know that failure should just be seen as another step toward finding the solution.

I also enjoyed using literature to help students define a problem and start brainstorming solutions. A few of my favorite environmental choices include: **The Lorax** by Dr. Seuss about pollution; **The Water Princess** by Susan Verde about clean drinking water; **One Plastic Bag: Isatou Ceesay the Recycling Women of the Gambia** by Miranda Paul about ways to solve the problem of plastic waste; **Saving the Planet and Stuff: A Novel** by Gail Guthier about a sixteen -year-old who interns for an environmental magazine and learns about politics of saving the environment; and **Flush** by Carl Hiaasen about a brother and sister who find out about a casino polluting protected waters.

Below is a sampling of **Educate.Today** videos that may help define a problem with environmental issues. Other Educate.Today videos defining problems in other areas of STEM can be found using the keyword "STEM."

Environment 4: Going Green Back to Nature
Environment 55: How Stormwater Runoff Pollution Affects the Environment
Environment 51: What can we do to reduce stores using plastic bags?
Environment 44: Celebrate the Earth with Less Pollution: Recycle Responsibly-and Remember to Reduce & Reuse!

Using STEM practices in my classroom has been an exciting and learning-filled process for my students and me. I encourage you to try out Educate.Today STEM video resources in your practice too. If you're interested in some additional online resources, below are a few I have found especially helpful.

Websites with Lesson ideas: http://scienceofeverydaylife.discoveryeducation.com/teachers/six-to-eight.cfm
http://www.stemcollaborative.org/
http://sciencenetlinks.com/collections/stem-and-common-core/
https://www.sciencebuddies.org/stem-activities
http://teachers.egfi-k12.org/
Engineering Design Process Diagram: https://www.sciencebuddies.org/science-fair-projects/engineering-design-process/engineering-design-process-steps