



STEM Resources

Title	Explanation
<u>Submarine Ring of Fire Expedition: Candy Chemosynthesis</u>	This relates to autotrophs. It has other topics integrated. Once you are done with the activity, you can ask your Algebra 2 class to think about away to show the formulas on a coordinate grid. Could they turn the science formulas into quadratic formulas and graph them? How are chemical formulas similar and different from the formulas we use in Math class? The purpose/objective would be to encourage students to see patterns and formulas in all arenas of life.
<u>High School STEM Activities for Kids</u>	This site has some STEM activities for high school. Some of them may need to be elevated, but they are a great starting point.
<u>STEM Curriculum, Grades 4-12</u>	This site from Oregon State University offers STEM lessons for grades 4-12 that meet the Next Generation Science Standards. The lessons are searchable by grade level or by subjects such as engineering, chemistry, bioenergy, and more.
<u>17 Examples of STEM Project Based Learning Activities</u>	Do you want to incorporate STEM lessons into your curriculum but aren't sure where to start? This article by Miriam Bogler offers 17 different topics that can be studied using STEM including growing plants, robot building, and video game analysis. Scroll to the end to find project ideas for high school.
<u>Gingerbread-ish Project</u>	This 3D Geometry project is a STEAM application that could be used in a geometry classroom.

<p><u>Floating Garden Challenge - STEM Challenge</u></p>	<p>This link from Tes will give you an opportunity to download a STEM project with all the steps and resources needed to complete the project in the classroom. Students study climate change and then design a floating garden. PowerPoint presentation, worksheets, and teacher's notes are included. This lesson is aimed at middle school and high school.</p>
<p><u>Design and Build a Rube Goldberg</u></p>	<p>This activity from Teach Engineering STEM Curriculum for K-12 provides directions to help students build a Rube Goldberg machine which is a machine that accomplishes a simple task through chain reactions. The site provides the corresponding standards, lesson plan, and worksheets that can be used to guide students in their designing and creating. The lesson is aimed at grades 7-9.</p>
<p><u>Rube Goldberg Video</u></p>	<p>This video demonstrates the Rube Goldberg Monster Trap created by a boy named Audri. He explains the process and predicts how many times it will take him to be successful. Although the boy is only seven, this video could be used for any age group to demonstrate what a Rube Goldberg machine is.</p>
<p><u>Real-World STEM Problems</u></p>	<p>Are you trying to figure out how to incorporate STEM problems into your teaching? This article by Anne Jolly explains what makes a good STEM lesson. She emphasizes that problem solving and real-world problems create the best lessons although the real-world problems are often difficult to create. To help she lists several websites and topics to find real-world problems. These ideas are targeted for middle grades but could also be used in high school.</p>

<u>Six Characteristics of a Good STEM Lesson</u>	What makes a successful STEM lesson? This article by Anne Jolly from Education Week outlines six key characteristics of a great STEM lesson. They are focused on real-world problems, use the engineering design process as a guide, use hands-on inquiry and open-ended questions, use teamwork, apply math and science content being learned, and have more than one right answer and use failure as part of the learning process. A brief description of each step is included. This article is helpful to any teacher trying to incorporate STEM lessons.
<u>10 Genius Science and STEM Activities with Craft Sticks</u>	Do your students like to build with their hands? This article from STEAM Powered Family provides ten STEM activities to do with craft sticks. The activities are briefly explained with a picture, and there is a link to the activity's details. This site has STEM activities for grades K-12.
<u>Construct and Test Roofs for Different Climates</u>	This video demonstrates a project where houses are designed with different roofs depending on the climate. The roofs are tested to see if they can withstand the climate they are built for. This video can be used to demonstrate real-world problem solving for grades K-12.
<u>From Modern Farm to Sustainable Table: Teaching STEM and Humanities with Authenticity</u>	This article explains a project done by ninth graders involving creating a garden and growing food. It incorporates biology, mathematics, social studies, and language arts.
<u>In San Diego, students juxtapose art and science to learn about the deadliest cancer</u>	This article explains a project done by 11th graders using art and science to learn about skin cancer.
<u>North Carolina STEM School Progress Rubric</u>	This rubric is used in North Carolina to assess where a school is in their STEM journey based on the criteria in the rubric. It could be a good tool for assessing your progress toward incorporating STEM completely into the school.

<u>How to Create Rubrics That Will Enhance STEAM Projects in the Math Classroom</u>	This article by Jeff Todd explains how to make a rubric for a STEAM project. Although it is written for 4th grade, the process can be easily copied for any grade. You can also submit your email address to receive a free sample K-8 rubric, which again could be tailored to the high school level.
<u>Rubrics from Northwest High School STEM Academy</u>	This page has sample PBL rubrics from the Northwest High School STEM Academy.
<u>New Mexico Governor's STEM Challenge: Evaluation and Judging</u>	This PDF provides a sample of rubrics and how to evaluate STEM projects used in the Governor's STEM Challenge competition in New Mexico.
<u>Pennsylvania's Governor's STEM State Virtual Competition Project Rubric</u>	This rubric is used to evaluate projects for the Governor's STEM State Virtual Competition in Pennsylvania.
<u>DIA Virtual Field Trip: Science at the Museum STEAM Unit</u>	This is a virtual field trip where students will go behind the scenes at the Detroit Institute of Art to discover what goes on behind the scenes and how STEAM disciplines are involved.
<u>Nasco Education: STEM/STEAM Lesson Plans and Activities</u>	This page has STEM and STEAM lesson plans and activities that are free to download. They are divided by grade level.
<u>50 Tips, Tricks, and Ideas for Teaching STEAM</u>	This article from We Are Teachers by Jenn Horton offers 50 tips and tricks to help you improve your STEAM lessons and projects.
<u>Hacking STEM Library from Microsoft</u>	This page from Microsoft has STEM projects that can be used in the classroom.
<u>OER Commons STEAM Collection</u>	This page has STEAM project and lesson plan ideas.
<u>Stem in English Language Arts</u>	This page offers six ways that ELA teachers can incorporate STEM into the classroom.
<u>English Teachers: How You Can Use STEAM in Your Classroom</u>	This article from the Resilient Educator offers some simple but concrete ways to incorporate STEAM into the ELA classroom.