STEM Curriculum Package: 4 Project Series Overview

We look forward to supporting you as you teach your students science process skills. The STEM Curriculum Package: 4 Project Series takes a scaffolded, PBL, real-world phenomenon approach to building students' leadership and STEM skills needed to lead authentic STEM projects. Upon completion, students identify as being STEM-capable and aspire to explore deeper STEM learning as applied to their everyday lives.

Project Lesson Plans

Each STEM Curriculum Package Lesson Plan is designed with 2 elements: (1) Project Overview, and (2) Project Activity # Plan. Check out an example of the first Project Lesson Plan.

The full curriculum package includes the resources you need to:

Feel prepared to teach and support students while introducing them to the process for doing science.
Learn how to foster students' growth mindsets and to identify STEM behind things in their everyday lives.

Curriculum Design & Outcomes

The STEM Curriculum Package approach to target learning outcomes is designed around a systematic set of Activities that are strategically designed to build students' skills to lead and "do" STEM research and projects like real scientists and engineers do.

Nature of Science: To develop student's identities as scientists, begin each newly introduced Activity by highlighting the Nature of Science – what scientists and engineers do in real life. Each project Activity states the Nature of Science as it's header. Consider asking a student to read the Activity Header out loud, then follow with "Now you get to be scientists and do ..."

Reflection: Dedicate quality time to the Transition and Reflection sections of the Project Plans. Remind them that the goal is for them to use the worksheets to guide their own authentic projects based on something that interests them. Build their confidence in their abilities to be scientists by reflecting on their ability to complete the Activities.

Skills-development: Each student Activity is designed to help students develop their 21st Century Skills for Success (3 C's) and STEM skills (NGSS Science & Engineering Practices). Use positive reinforcement to highlight the skills that students develop for each Activity.

Student Learning Outcomes	Achievement Mechanism
Feel empowered to lead and develop authentic science projects with minimal adult support.	Students learn to use the Activity worksheets as a systematic set of tools designed to challenge them to lead every activity.
Connect the skills they develop during their projects and what scientists and engineers do in their careers.	Each Activity worksheet begins with a Nature of Science section header that relates what they are about to do with what scientists and engineers do as part of their careers.
Identify as being scientists and engineers and know "Hey, I can do STEM!"	The scaffolded Activities to the 3-project series build students' independence leading their learning, while also students connect their work with real world STEM research.
Aspire to explore deeper in-class and out-of-class STEM learning as applied to their everyday lives.	Students are challenged to develop and lead their own projects around a given phenomenon in their everyday lives, rather than simply following pre-defined procedures.
Develop leadership and STEM skills they need to tap into strong economic opportunities all around them.	Students are challenged to develop each 21st Century Skills to Succeed (4 C's) and their NGSS Science & Engineering Practices (8 practices), which are proven to be essential skills for career development.
Learn Scientific Inquiry and "The" Scientific Method.	Project 1 is a Scientific Inquiry Project, while Projects 2 & 3 are Experimental Projects, whereby students lead "The" Scientific Method.

Curriculum Activities & Alignment

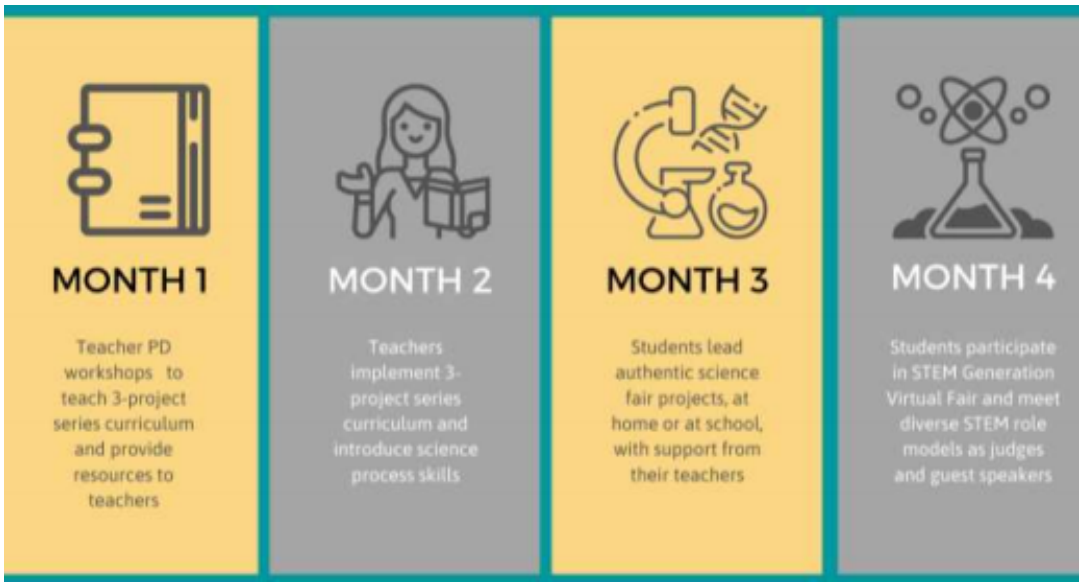
With each STEM Curriculum Package project, students conduct a scientific experiment that uses prior knowledge from their own life experience. Each project aligns with and supplements the 3D Next Generation Science Standards (NGSS) as noted in the table below.

Project #	Project Activities (Bold = focus)	Materials (Bold = kit items)	3D NGSS *PEs - CCs* - SEPs
1	**Ask Exploratory Questions** **Make Observations** **Identify Core Ideas** Collect Data Reflect on Project Ask Scientific Questions Evaluate Projects	*Timer*	**Health & Heart Rate** *(Mindfulness)* **PEs**: MS-LS1-3 **CCs:** Patterns; Cause and Effect **SEPs:** Asking Questions and Defining Problems; Obtaining, Evaluating and Communicating Information

2	Ask Exploratory Questions Make Observations Identify Core Ideas Ask Scientific Questions **Design Experimental Project** **Identify Variables & Constants** **Draw Experimental** **Setup Assess Health & Safety Risks** **Write Experimental Procedure** Collect & Record Data Reflect on Project Evaluate Project	• **Bouncy Ball** • **Elastic Band** • **Metal Spring** •**Thermometer** • **Meter Tape**	**Elasticity** **PEs**: 3-PS2-2, 3-PS2-1, 5-PS2-1 **CCs:** Patterns; Cause and Effect; Systems and System Models; Energy and Matter **SEPs**: Asking Questions and Defining Problems; Developing and Using Models; Planning and Carrying Out Investigations; Obtaining, Evaluating and Communicating Information
3	Ask Exploratory Questions Make Observations Identify Core Ideas Ask Scientific Questions Design Experimental Project Identify Variables & Constants Draw Experimental Setup Assess Health & Safety Risks Write Experimental Procedure **Collect & Record Data** **Plot Data** **Reflect on Project** **Evaluate Project**	• **Toy Car** • **Erasers** • **Elastic Band** • **Meter Tape** • *Ramp*	**Gravity & Momentum** **PEs**: 3-5-ETS1-1, 3-5-ETS1-2, **CCs:** Cause & Effect; Systems & System Models; Scale, Proportion & Quantity; Energy & Matter; Structure & Function **SEPs**: Asking Questions and Defining Problems; Developing and Using Models; Planning and Carrying Out Investigations; Analyzing and Interpreting Data Using Mathematics and Computational Thinking; Obtaining, Evaluating and Communicating Information

4	Ask Exploratory Questions Make Observations Identify Core Ideas Ask Scientific Questions Design Experimental Project Identify Variables & Constants Draw Experimental Setup Assess Health & Safety Risks Write Experimental Procedure Collect & Record Data Plot Data Reflect on Project Evaluate Project	Dependent on Student's Project	**SEPs**: Asking Questions and Defining Problems; Developing and Using Models; Planning and Carrying Out Investigations; Analyzing and Interpreting Data Using Mathematics and Computational Thinking; Obtaining, Evaluating and Communicating Information

Recommended Program Timing



Project	**Total # of In-class Instruction + Student Working Hours**	
	Entry-Level Students	***Accelerated Students***
Project 1	2 - 3 hours	1 - 1.5 hours
Project 2	3-4 hours	2-3 hours
Project 3	4-5 hours	3-4 hours
Project 4	5-7 hours	4-5 hours

Earn Up to $250 in Gift Cards

STEM Generation is offering you up to $250 in gift cards for your participation sharing assessment and feedback. Refer to the Participating Teacher Offered Perks for details.

Please understand that we count on your feedback and shared anonymous assessments to demonstrate the efficacy of our programming to our donors and sponsors. We also rely on the feedback and assessments to improve our programming and to quantify our impact. Your optional participation is important for our ability to continue to donate our programming to teachers serving at high FRL enrollment schools.

Getting Started

The STEM Curriculum Package project lessons and instructions are clearly laid out in Google Docs, with a choice of format: **In-person or remote learning**. The remote learning versions of the lessons have more comprehensive instructions and support materials, with voice-over and supplemental online materials. For each hands-on Activity, whether in-class or remote, students record their work online, or alternatively, in your printed lessons.

Precede the first lesson with these activities:

1. Follow instructions in the README document provided in the shared Google Folder.
2. Work through each experiment yourself using identified materials (1-2 hours).
3. Facilitate the online Student Pre Survey (5-10 minutes)
4. Allocate time in-class for students to write their names on their folders (included in donated Project Kits) and to safely explore the project materials (5-10 minutes).

We are here for you

Effective facilitation of the STEM Curriculum Package projects is the top priority of the STEM Generation, Science Fair Fun team. We want to support you in any way we can. Please do not hesitate to reach out to us at any time with questions. We are here for you.
Email us at: dewey@sciencefairfun.org
Schedule a meeting during office hours: https://calendly.com/stemgeneration/stem-curriculum-office-hours

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