VERMONT
AGENCY OF EDUCATION

219 North Main Street, Suite 402
Barre, VT 05641 (p) 802-479-1030 | (f) 802-479-1835

Emmet's Storm
A NSTA "STEM" Trade Book

Description	Emmet is a different type of thinker. He is curious, always asking questions, planning and carrying out investigations. He is persistent. He perseveres and continues to try to solve problems even though many of his ideas do not work the first time. No one takes Emmet seriously. When the storm arrives, Emmet has another idea. Does anyone listen? Time to read this awesome book with many characteristics of a STEM thinker.
SS Connection ● Performance Expectations, ● Science& Engineering Practices, ● Crosscutting Concepts,	• . Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. 3-ESS3-1 ● Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. 5-ESS2-1
● *Connections to Engineering, Technology and Applications of Science* *Nature of Science*	● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and to meet the needs of society. ● Tools and instruments are used to answer scientific questions, while scientific discoveries lead to the development of new technologies. Scientific methods are determined by questions. Science investigation use a variety of methods, tools, and techniques. Science is a way of knowing used by many people. Creativity and imagination are very important to science. Science affects everyday lives
Common Core ELA	CCSS.ELA-LITERACY.RI.3.3 Describe the relationship between a series of historical events, ***scientific ideas or concepts***, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Emmet's Storm has so many possibilities for use in building STEM thinking and for science instruction and there is a difference. Let's talk STEM first. Emmet is a STEM thinker. He asks questions, he is so very curious. He is constantly coming up with ideas, many that don't work but that doesn't stop Emmet. He is very much like Thomas Edison who had thousands of "mistakes" before he invented the lightbulb. As educators we need to instill some of these same qualities in our students.

Developing STEM THINKING

Examples 1:
I wonder what our school will be like in 20 years. Let's brainstorm ideas and I will record them.
I wonder how we might improve…..
I wonder if we can solve the problem of …
Example 2:

"A construction based challenge can be an excellent project for encouraging children to think creatively, to solve problems and to express their own ideas using a range of practical materials. Construction challenges provide a fabulous platform for the development of a range of important study, work and life skills, including;

- Inventiveness
- Problem solving
- Creative thinking
- Consideration of the legitimacy and relevance of sources of information
- Perseverance, motivation and the ability to overcome disappointment
- Evaluation, editing and revision
- Analytical thinking
- Use of a range of real life tools"

http://childhood101.com/2014/06/5-construction-challenges-for-kids-stem/

Example 3:

Emmet used his pulley ideas to save his classroom. What ideas can we come up with to improve our local environment, make it safer, cleaner or more fun? Schoolyard ideas. How can we redesign our classroom to better fit our learning needs?

Example 4:

Emmet was a questioner and he used his questions to build his understanding. Sometimes the questions led to experiments; sometimes not. What type of things do you do to stimulate questioning with your students? One simple activity is to create small mystery boxes with some objects such as rice, paper clips, and/or tiny noodles inside. Tape the boxes shut and have students handle boxes and ask questions. Record the questions. Some of them will be investigable questions that will lead students either to answers or more questions.

Developing NGSS Science Instruction

Grade 3 :

The Northeast experienced a blizzard like one Emmet on March 14, 2017 (Pi Day)and his classmates . Let's brainstorm different ways we might reduce the impact of the blizzards. Teacher would record all ideas and students then work in pairs to design/test solutions.

Grade 5

Prior to using this resource students should have had opportunities to explore the different systems.

My number one choice for a resource:

http://millriverschools.org/documents/drivesync/Curriculum%20Website/Science/GL%205/Gr.%205%20Earth%20Systems.pdf

Prior to using this resource students should have had opportunities to explore the different systems.

I would make some adjustments to this lesson. In the Engage section, I would ask students to use words and pictures to define geosphere, atmosphere, biosphere, & hydrosphere. By doing this we would be eliciting student's prior knowledge.

http://www.smusd.org/site/handlers/filedownload.ashx?moduleinstanceid=35284&dataid=53618&FileName=Grade%205%20NGSS%20Science%20Earth%20Systems%20in%20a%20bottle%205%20ES.docx

https://betterlesson.com/lesson/638120/overview-of-earth-s-systems

Prior to using this resource students should have had opportunities to explore the different systems.

https://www.opened.com/video/physical-processes-the-4-spheres-youtube/212139

Common Core ELA

Describe the relationship between a series of historical events, ***scientific ideas or concepts***, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Think about all Emmet's experiments & ideas and have students make cause and effect statements:

- what happened because Emmet had an idea of storing electricity;

- what was the results when Emmet shared his thinking about the wrong color of the fire;

Have students find the evidence in the text to support their cause and effect claims.