STEMtastic Science Learning with Seesaw

Rachael Lehr
Hello!

I am Rachael Lehr
I am a primary Science & Digital Technologies specialist teacher at West Beechboro PS & host of #PrimarySTEMChat
You can find me at @rachaellehr on Twitter
Is Science Learning STEM?
My Teaching Philosophy

- Question and wonder – start with BIG questions
- Hands-on, inquiry based learning
- ‘Real science’ – beyond the classroom
- Girls’ STEM Club
- Makerspace/design challenges
- Engaging classroom environment
- Embedded digital technologies to display learning
- A focus on 4 C’s and more…

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What is STEM?

Science  Technology  Engineering  &  Mathematics

STEM
The overarching theoretical framework for STEM education is curriculum integration; with a focus on deep learning and engaging students in creative thinking and problem solving through “real world” learning experiences.

(Corlu, Capraro & Capraro 2014)
STEM is a culture of learning, or pedagogy, rather than a separate content area...

(GE-STEM https://globaledstem.wordpress.com/)
<table>
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<tr>
<th>Students</th>
<th>Thinking</th>
<th>Exploring &amp; Making</th>
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Why embed STEM Learning at West Beechboro PS?

Keeping alive the ‘Why...?’ and the innate curiosity & wonder of children, while preparing them with the skills & capabilities to succeed in the future, through integrating science & STEM learning.
Planning for STEM Learning in Science

- Subject Specific Content/Skills - Science, Technologies, Engineering & Mathematics
- Interdisciplinary approach beyond S.T.E.M. - Cross-Curricular Learning
- Problem/Project Based Learning
- Real World Problem Solving
- General Capabilities/STEM Capabilities / 21st Century Skills

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STEM across the Curriculum

STEM is in the Curriculum via:

• Science
• Technologies – Digital and Design
• Mathematics
• General capabilities – Numeracy, ICT capability & Critical & Creative Thinking
• Engineering is in Design and Technologies - engineering principles & systems

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Real World Problem Solving

- Global Goals
- Current events
- Problems happening in your class/school/community
- Issues students care about
- Problems in a fictional texts/movies

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STEM Thinking Dispositions

1. Metacognitive
2. Imaginative
3. Problem Solving
4. Skeptical/Inquisitive
5. Altruistic
6. Risk Taking
7. Persistent
8. Interconnecting

Metacognition, Problem Solving, Altruism/empathy, Persistence/grit, Imagination/originality, Skepticism/inquisitiveness, Risk taking, Interconnection
Planning for Teaching & Learning

- Start with curriculum content descriptors (SU, SIS, DT)
- Map out concepts to learn
- What activities will enhance learning?
- Consider SOLO Taxonomy - Surface to deep learning
- Is there a potential STEM/real-world problem-solving focus?
- How can students use DT to display learning?
Science and Engineering

Engineering design process embedded into science learning

Ask
Imagine
Plan
Create
Improve

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Science and Maths

- Maths is everywhere in Science - can we make it more explicit?

Image: https://iscatenglish.wordpress.com/2014/05/13/maths-and-science-day/

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Science and Technologies

• High tech
DT are tools that allow students to learn and display learning, but the DT curriculum also focuses on developing digital literacy, digital citizenship & computational thinking. (Apps, robots, coding, 3D printers, drones, AR/VR etc.)

• Low tech
STEM learning in science can require low tech. tools - hot glue, Stanley knives, scissors, tape, Makedo etc.
STEM & PBL & Seesaw

1. Driving Questions

2. 21st Century Skills

3. Students Inquire

4. Students Have Voice & Choice

5. Students Learn As They Need To Know

6. Students Revise & Reflect

7. Student Present To An Audience
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2. 21st Century Skills

- Collaboration
- Critical Thinking
- Communication
- Creativity
Collaboration

Working together to reach a goal

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Critical Thinking

Looking at a problem in a new way, linking learning

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Communication

Sharing thoughts, questions, ideas and solutions
Creativity

Trying new approaches to get things done, innovation & invention

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Creativity

Trying new approaches to get things done, innovation & invention

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<th>Keynote Slideshows</th>
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<th>Book Creator eBook Creator</th>
<th>Do Ink Green Screen</th>
<th>Minecraft Edu Gaming</th>
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<td>ChatterKid Animated videos</td>
<td>Paper Drawing</td>
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<td>Word Clouds Word cloud creator</td>
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<td>Flipgrid Video collaboration</td>
<td>Pic Collage Photo collage</td>
<td>Padlet Collaborative ideas</td>
<td>Draw &amp; Tell Drawing &amp; Video</td>
<td>Clips Movie editor</td>
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Let’s try out Seesaw

Log-in to the class
Integrating DT into Science

- Keep it simple.
- Use a few apps/programs well.
- Be aware that although it takes a while at the start to learn how to use DT, it doesn’t take long before the students will be flying with it.
- Make sure it is authentic, embedded and purposeful.
- Not every lesson will go to plan!
- Have fun!
Embedding STEM Learning in Science

A chair for Karri Koala

Year 1
Chemical Sciences
Embedding STEM Learning in Science

Machines to Manage Plastic Pollution

Year 4 Chemical Sciences
Embedding STEM Learning in Science

Traps for Heffalumps

Year 2 Physical Sciences
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A SuperDuper Intergalactic Space Rocket

Year 2 Chemical Sciences

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Kinetic Sculptures

Year 4 Physical Sciences/ Chemical Sciences

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Nest/bird habitat building

Year 2 Biological Sciences
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Most Magnificent Things

Year 2 Chemical Sciences

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3 Little Pigs’ Houses

Year 2
Chemical Sciences

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Let's have a go!

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Planning for STEM learning
Embedding STEM Learning in Science

• Let’s look at the SU content descriptors and, considering what STEM Learning ideally looks like, let’s design a science lesson/project with a STEM focus?
• Using the SU Content Descriptor you’ve been given, think about a STEM focus that you could have based on that...
• Add your thoughts to padlet.com/rachaellehr/Muresk
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Can you find a STEM problem to solve in a fiction story?

[URL]: padlet.com/rachaellehr/STEMstories

@rachaellehr #CONASTA68
Sustainable Development Goals

- What STEM learning could be planned around a SDG?

- padlet.com/rachaellehr/SDGs
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Conclusion and Thanks

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#PrimarySTEMChat
Thanks!

Any questions?
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