NGSS... What Materials Are Out There To Help?

Melissa Wells
- Calvin University (Chemistry and Biology)
- Purdue University (Masters in Progress)
- 6 Years Teaching (Going into my 7th)
- Michigan Great Lakes Virtual Academy
- Presented at MACUL
- Twitter: @melship34

Agenda
- What resources are available for NGSS?
- What do we do when we can’t find what we need?
- How do we put these resources together?
Ideas

What resources are available for NGSS?
Next Generation Science Standards

- Original Site
- Pros: Bundles
- Cons: Nothing is created

https://www.nextgenscience.org/high-school-domains-model-course-1-chemistry
NGSS @ NSTA

- Pros: Multiple ideas and resources
- Cons: Not consistent with the resources you will get

https://nsta.nsta.org/classroom-resources-results.aspx?Corridor=1
NGSS @ NSTA

- Pros: Multiple ideas and resources
- Cons: Not consistent with the resources you will get

https://nstances.org/daroom-resources-reads.aspx?Resource=1

Chemical Reactions and Stoichiometry

Contributor: The Concord Consortium (Dan Damelin, National Science Foundation grant 0608181)
Type Category: Instructional Materials
Types: Interactive Simulation

Note: This resource, voted by NSTA curators, is provided to teachers along with suggested modifications to make it more in line with the vision of the NGSS. While not considered to be "fully aligned," the resources and expert recommendations provide teachers with concrete examples and expert guidance using the EQuIP rubric to adapted existing resources. Read more here.

Reviews
No reviews
Be the first to write a review

Description

This series of interactive simulations provide students with the ability to experiment with reaction concentration and temperature to observe the effects on a chemical reaction. This simulation is coupled with questions that lead students to develop a conceptual understanding about how these factors affect...
Phenomena for NGSS

- Pros: Phenomena Clips to engage students
- Cons: Nothing is developed

https://www.ngssphenomena.com
HS-Physical Science

- Pros: Breakdown
  - Standard
  - Links to Lessons
  - State
  - Phenomenon
- Cons: Not every lesson is fully developed yet. It is a work in progress.

<table>
<thead>
<tr>
<th>HS Physical Science (PS) Standard</th>
<th>Link to Lesson</th>
<th>State</th>
<th>Lesson Topic</th>
<th>Phenomenon</th>
<th>Lesson GPC or SE</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS-PS1-1</td>
<td>Periodic table as a model to predict</td>
<td>HI</td>
<td>Periodic Trends and Reactivity</td>
<td>My mother’s silver ring tarnished but her gold ring does not.</td>
<td>GRC</td>
<td></td>
</tr>
<tr>
<td>HS-PS1-1</td>
<td>Periodic table as a model to predict</td>
<td>HI</td>
<td>Periodic Trends and Reactivity</td>
<td>Nothing Happening Here: Under Construction, need a HS science teacher to write this lesson.</td>
<td>GRC</td>
<td></td>
</tr>
<tr>
<td>HS-PS1-1</td>
<td>Periodic table as a model to predict</td>
<td>HI</td>
<td>Periodic Trends and Reactivity</td>
<td>Inert Gases and Periodic Trends: The constitution was sealed in a glass case from 1951 to 2001, but then opened to protect it from attack.</td>
<td>GRC</td>
<td></td>
</tr>
<tr>
<td>HS-PS1-2</td>
<td>The outcome of a simple chemical reaction based on the electron attraction of atoms, ions in the periodic table, and patterns of chemical properties</td>
<td>HI</td>
<td>Chemical Formulas from Empirical Data</td>
<td>A piece of iron weighs more after it rusts than before it rusts.</td>
<td>GRC</td>
<td></td>
</tr>
<tr>
<td>HS-PS1-2</td>
<td>The outcome of a simple chemical reaction based on the electron attraction of atoms, ions in the periodic table, and patterns of chemical properties</td>
<td>HI</td>
<td>Chemical Change Single Replacement</td>
<td>Phenomenon: In the Big Room in the Carlsbad Caverns a large bridge named the Toronto Bridge formation spans across many feet.</td>
<td>GRC</td>
<td></td>
</tr>
</tbody>
</table>

https://docs.google.com/document/d/1E4bJ463_0hP4GRC/eRg6IoFg/6awkvYkX/rYX6A/0/A1/481
HS-Physical Science

- Pros: Breakdown
  - Standard
  - Links to Lessons
  - State
  - Phenomenon

- Cons: Not every lesson is fully developed yet. It is a work in progress.
HS-Physical Science

Pros: Breakdown
- Standard
- Links to Lessons
- State
- Phenomenon

Cons: Not every lesson is fully developed yet. It is a work in progress.
Project Phenomenon

- Pros: Breakdown
  - Explanation
  - Resources
- Cons: Nothing is fully developed and there are only a few for Chemistry.

https://sites.google.com/site/chemphenomena/
#Project Phenomenon

- **Pros:** Breakdown
  - Explanation
  - Resources

- **Cons:** Nothing is fully developed and there are only a few for Chemistry.

https://sites.google.com/site/projectphenomenon/

---

**Detergent Pens Remove Stains**

The detergent pen can remove stains from clothing using the mixture of substances described in the article.

**Phenomenon Scale or Size:**
Investigative Phenomenon

**Suggestions for Classroom Use:**

**Resources**
- [Ingredients of a Tide detergent pen](https://www.explorestuff.com)
- [Chemistry of Stain Removal](https://www.explorestuff.com)

**Resource Type(s):**
Article or Text

**DCI:**

**Grade:**
9-12

**Contributed By:**
Brittn Belyea
Torrey Pines High School
blye@sdusd.net
The Phenomenon Master List

Pros: Breakdown
  o Multiple Ideas
  o Some Links
Cons: Nothing is developed for the classroom

https://docs.google.com/document/d/1yv7QbVzUsVgDj13IMkZBzbNQg9DQpmL_E9z2byt7zh-g/edit#heading=h.2y9A4ddgnhJ0
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards
The Wonder of Science

- Pros: Assessments, Phenomena, Concepts, Videos and Learning Plans
- Cons: You will need to develop your lessons in a different platform for your students.

https://thewonderofscience.com/standards

Common Core Connections

ELA/Literacy
- **WHST.9-12.2**: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- **WHST.9-12.5**: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Mathematics
- **HSN-Q.A.1**: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- **HSN-Q.A.3**: Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Bozeman Science

- Pros: Materials
  - Posters
  - 3-D Planning Cards
  - Graphic Organizers
- Cons: It only has materials to guide thoughts.

http://www.bozemanScience.com/ngss

Constructing Explanations

1. Brainstorm Possible Causes
2. Identify a scientific Cause
3. Describe a causal Mechanism
4. Formulate a Research Question
5. Describe the phenomenon.
Bozeman Science

- **Pros:** Materials
  - Posters
  - 3-D Planning Cards
  - Graphic Organizers
- **Cons:** It only has materials to guide thoughts.

http://www.bozemanScience.com/ngss
Virtual Labs

You have a phenomena, but what virtual labs and simulations are available?
Phet

- Pros: They have multiple simulations
  - Demos
  - Labs
- Cons: You will need to develop your lessons for students.

Phet

- Pros: They have multiple simulations
  - Demos
  - Labs
- Cons: You will need to develop your lessons for students.

Phet

- Pros: They have multiple simulations
  - Demos
  - Labs
- Cons: You will need to develop your lessons for students.

Phet

- Pros: They have multiple simulations
  - Demos
  - Labs
- Cons: You will need to develop your lessons for students.

CK-12

- **Pros:** A virtual textbook that is editable and they have simulations.
  - Demos
  - Labs
- **Cons:** Need to use the textbook in Ck-12 or Google Classroom

https://interactives.ck12.org/simulations/chemistry.html
CK-12

- **Pros:** A virtual textbook that is editable and they have simulations.
  - Demos
  - Labs
- **Cons:** Need to use the textbook in Ck-12 or Google Classroom

https://interactives.ck12.org/simulations/chemistry.html
CK-12

- Pros: A virtual textbook that is editable and they have simulations.
  - Demos
  - Labs
- Cons: Need to use the textbook in Ck-12 or Google Classroom

https://interactives.ck12.org/simulations/chemistry.html
CK-12

- **Pros:** A virtual textbook that is editable and they have simulations.
  - Demos
  - Labs
- **Cons:** Need to use the textbook in Ck-12 or Google Classroom

https://interactives.ck12.org/simulations/chemistry.html
AACT

- Pros: Simulations that are easy to use.
- Cons: You can't embed materials directly into your LMS.

https://teachchemistry.org/classroom-resources/simulations
AACT

- Pros: Simulations that are easy to use.
- Cons: You can't embed materials directly into your LMS.

https://teachchemistry.org/classroom-resources/simulations
AACT

- Pros: Simulations that are easy to use.
- Cons: You can't embed materials directly into your LMS.

https://teachchemistry.org/classroom-resources/simulations
ChemCollective

- Pros: Virtual labs with real lab equipment.
- Cons: A little clunky and can be difficult to use.

http://chemcollective.org/vlabs
ChemCollective

- Pros: Virtual labs with real lab equipment.
- Cons: A little clunky and can be difficult to use.

http://chemcollective.org/vlabs
Glencoe Virtual Labs

- Pros: Virtual labs that have a place for students to take notes, make tables, etc...
- Cons: You will need to create an intro video for students to be specific about what to click.

https://www.biologycorner.com/worksheets/virtual_labs_glencoe.html
Glencoe Virtual Labs

- Pros: Virtual labs that have a place for students to take notes, make tables, etc...
- Cons: You will need to create an intro video for students to be specific about what to click.

https://www.biologycorner.com/worksheets/virtual_labs_glencoe.html
Nothing Available

What can you do if you can’t find the simulation and/or lab you want?

“Obstacles don’t have to stop you. If you run into a wall, don’t turn around and give up. Figure out how to climb it, go through it, or work around it.”

~Michael Jordan
Nothing Available

What can you do if you can't find the simulation and/or lab you want?
Nothing Available

What can you do if you can’t find the simulation and/or lab you want?
Nothing Available

What can you do if you can't find the simulation and/or lab you want?
Nothing Available

What can you do if you can’t find the simulation and/or lab you want?
Nothing Available

What can you do if you can't find the simulation and/or lab you want?
Nothing Available

Find a new anchoring phenomena?
Create Your Own

- Gifs
- Google Slides
Create Your Own

- Gifs
- Google Slides
Create Your Own

- Gifs
- Google Slides
Creating the Gif

- Screen Shots
- Gif Maker
Editing Google Slides

- Setting up
- Linking
- Inserting Gifs
- Embedding
Putting Things Together

It is important to reduce the links you have your students go to. How do you do this?
Platforms (Virtual Textbook)

- Wix
- CK-12
- Google Sites
- Weebly
Where to Find these resources?

www.melsteachingcorner.blogspot.com
https://www.lessonsforschool.com/
Twitter: @melshep34
To complete a brief survey about this webinar, and to generate your certificate of attendance, visit:

To Download Resources:
https://bit.ly/MelissaWells

Want to present a webinar? Send an email!
AACTwebinar@acs.org