Getting Kids Invested with Stories: The Car of the Future

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Jud Hill
EDC’s Center for Science Education
chill@edc.org

Laura Baumgartner
Robinswood High School – Bellevue, WA
Baumgartnerl@bsd405.org

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<thead>
<tr>
<th>Car System</th>
<th>Function</th>
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<tbody>
<tr>
<td>Fuel</td>
<td>Engine, Air Condition</td>
</tr>
<tr>
<td>Electrical</td>
<td>Lights, Locks, Stereo, Windows, etc.</td>
</tr>
<tr>
<td>Braking</td>
<td>Stoping, Steering, Braking</td>
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<tr>
<td>Cooling</td>
<td>Cool engine</td>
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<tr>
<td>Steering / Suspension</td>
<td>Control car movement</td>
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<tr>
<td>Exhaust</td>
<td>Removes fumes from passengers</td>
</tr>
<tr>
<td>Powertrain</td>
<td>Transfers energy</td>
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</table>
Stories in Science Class

Why use stories? Story telling ...

- ... provides a framework we can relate to and remember.
- ... conveys facts in a traditional way.
- ... links physics and chemistry to applications.
- ... rehumanizes science.

“We live, learn, and relate to others through stories.”

E.O. Wilson

Wiggins’ Understanding by Design

Main Points

1. Define the content students should know based on AAAS and NSES standards.
2. Organize content into three levels of knowledge—enduring understanding, important to know and do, and worth being familiar with.
3. List evidences of understanding of the content, including performances.
   - Enduring understanding is best assessed by performance tasks and projects.
   - Content that is important to know and do assessed by performance tasks and by quizzes and tests.
   - Content that is worth being familiar with is best assessed by quizzes and tests.
4. Establish essential questions for students to answer. These questions should provoke and sustain student interest, and when answered, they should uncover the content established in step 1.
5. Plan and sequence activities to address the evidences of understanding and essential questions.
Selection of a Story

- is grounded in science.
- addresses appropriate learning objectives aligned with the standards.
- connects known with the unknown.
- piques students’ interests (poses a challenge/problem).
- makes it enjoyable without oversimplifying.

☞ can be fictional or non-fictional.
☞ can have human or science concept as protagonist.

Foundation Science Learning Cycle

Consider
- Story, Task, Brainstorm

Investigate
- Challenge, Activity, Design

Apply
- New Challenge, Career, Extend

Process
- Synthesize, Present, Discuss, Write
Using the Power of Story
Throughout the Learning Experience

1. Setting the Context
   Students get engaged in the story.

2. Experimenting and Investigating
   Students take ownership of the story.

3. Processing for Meaning
   Students tell their story.

4. Applying
   Students apply new understanding to new situations.

Story is NOT a product; story is a process!

Practical Example: The Car of the Future

Consider: Story
Investigate: Build a Car-Moving Device
Process: Present
Apply: Back to the Story
Addressed AAAS/NSES Standards

Goals for Student Understanding
- Students know that energy appears in different forms
- Students know that energy can be converted from one form to another
- Students understand that energy can be transferred
- Students should know that energy cannot be created or destroyed

Student Assessment Outcomes
- Students can write word equations for energy conversions
- Students can apply the law of conservation of energy to a new situation or system

Story: A Process, not a Product

Students shape their story throughout the learning experience
- structures student’s experience.
- challenges student’s assumptions and conclusions.
- involves interpretation, reinterpretation.
- results in the transformation of “knowing” into “telling”.
Download our Handouts

http://sepuplhs.org

Wrap-up

Further Readings