

Green Chemistry & PBL

Putting Green Chemistry
projects into a high school
classroom

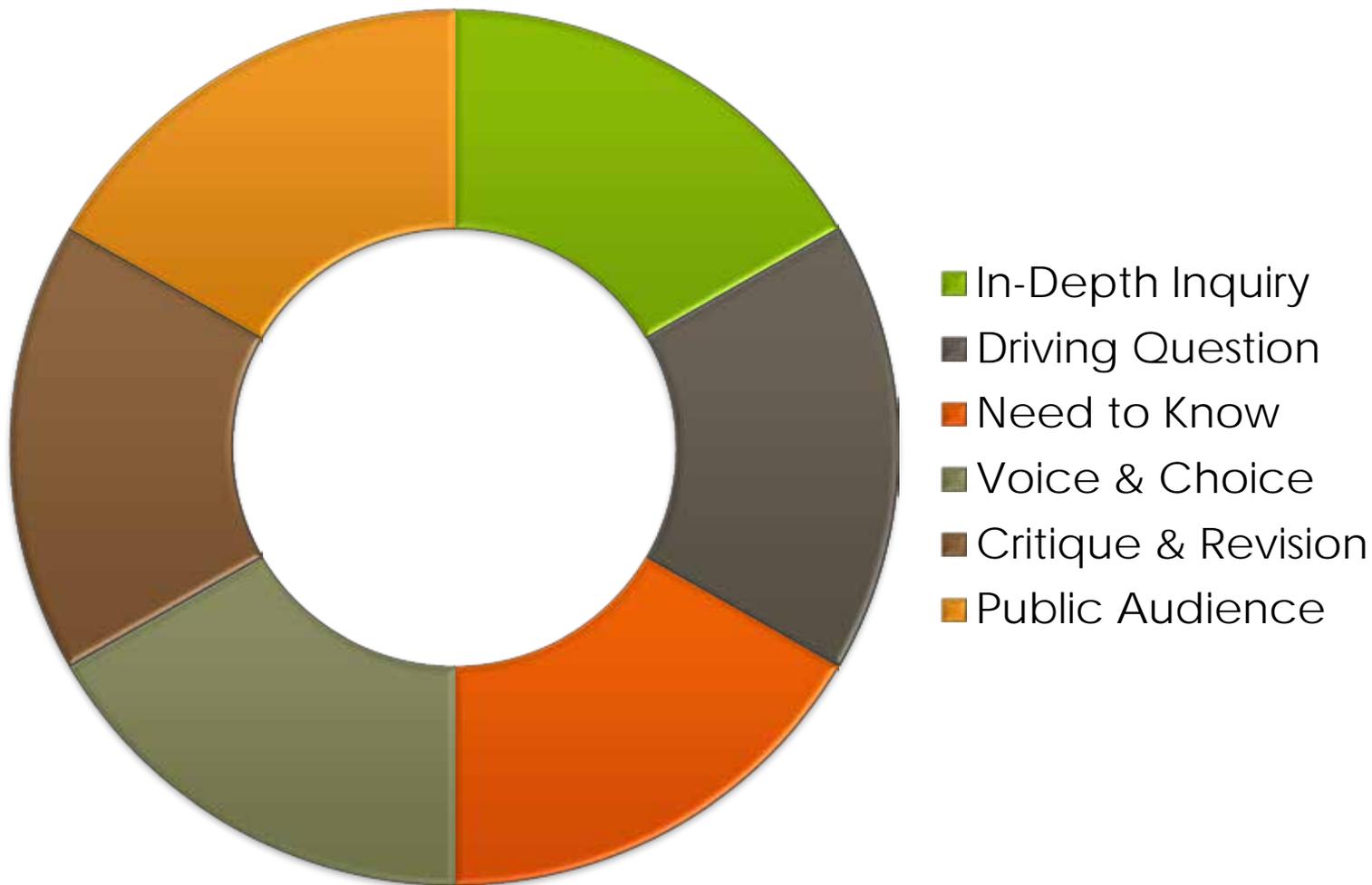
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What is a good project?

- › Must fulfill two criteria *
- › Students must perceive it as personally meaningful, as something that matters, and something they want to do well.
- › Must have an educational purpose *
- › Should be well-designed and well-implemented.

* John Larmer Buck Institute for Education 2014

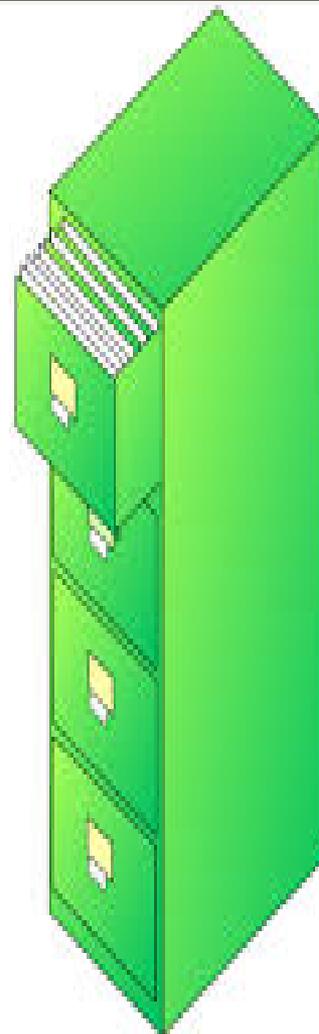
Significant Content & 21st Century Skills



	LIMITED	AMBITIOUS
Duration	10-15 contact hours	20+ contact hours
Breadth	One subject	Interdisciplinary
Who's Involved?	One teacher	Several teachers, outside experts, community
Authenticity	Simulates the real world	In of for the real world
Audience	School	Experts, community, world, web
Student Autonomy	Teacher-defined; tightly managed	Co-defined and managed
Technology	Create the product	Manage the process

› **Sources of Inspiration**

- › Your Community
- › Current Events
- › Real-World Problem
- › Your Content Stds.
- › Your Colleagues
- › Your Students
- › Online Project Libraries
- › Project Search @ bie.org
- › PBLU.org



Putting PBL & Green Chemistry Together

- › Look to your community
 - › Green building
 - › Energy system
 - › Transportation
- › Look at state issues
 - › Transportation
 - › Waste disposal
- › Look at national issues
 - › Keystone Pipeline
- › Beyond Benign website
 - › Presidential Award winners
- › Look to industries
 - › Steelcase

Steelcase/Green Chemistry & PBL

- › Introduction at BCCE 2014 in Grand Rapids
- › Steelcase and green chemistry practices
 - › Presented cutting edge practices to chemistry teachers
 - › Group discussion of how to incorporate these into a high school chemistry class
 - › Brainstormed ideas on how to incorporate

Ecovative & Steelcase



- › Ecovative
- › Launch: Students introduction to project
 - › Shown TED talk: "[Are Mushrooms the new plastic?](http://www.ted.com/talks/eben_bayer_are_mushrooms_the_new_plastic?language=en)"
http://www.ted.com/talks/eben_bayer_are_mushrooms_the_new_plastic
 - › Learn how Steelcase uses this for packaging
- › Students develop another practice that incorporates agricultural waste and mycelium (mushroom roots)

Sharklet

- › Launch: “Making Stuff Smarter” from NOVA with segment on Sharklet
- › Activity on Biomimicry from Beyond Benign
- › Project: Students look to nature to develop a product using green chemistry and biomimicry.

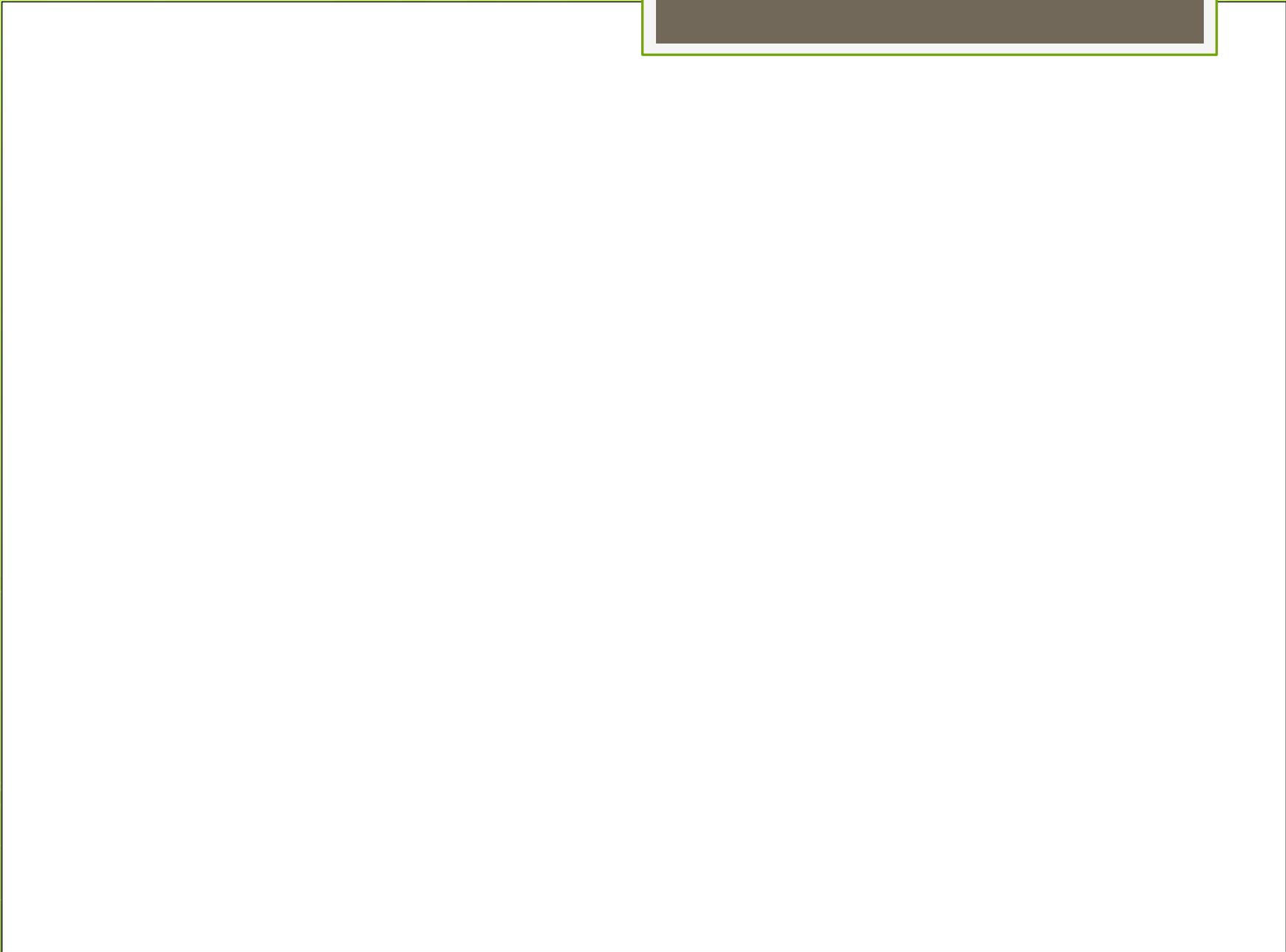


Using the BIE PBL method

- › Materials are online at bie.org
- › Reading: "8 Essentials for Project-Based Learning"
- › Getting Started
 - › Driving Question
 - › Build Knowledge
 - › Develop & Critique
 - › Present Products and answer Driving Question

Project Design Rubric

- › Can be found at the bie.org site.
- › [Project Design Rubric](#)





Questions?

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