**Day 4**

**Title: Introduction to Biofuels**

Thursday Week 1

**Length of Time:**

1 class period between 45-50 minutes

**Environment:**

The desks will be in a horse shoe shape with teacher’s table/desk in front of classroom.

**Standards:**

**Indiana State Biology I Standards**

\*B.4.2 Describe how human activities and natural phenomena can change the flow and of matter and energy in an ecosystem and how those changes impact other species

**Biofuels Standards**

2. Students will be able to diagram the processes involved in biofuel production.

**21st Century Skills**

Communication

**Objectives:**

Learners will study the current methods utilized by biofuel specialists.

Learners will research the current methods utilized by biofuel specialists.

**Materials:**

Students have prepared questions and teacher has sent questions to speaker one week before presentation.

Projector

Guest speaker (TBA)

Bell ringer & Exit ticket

Student Science Journal, if needed

**Opening:**

**Either--**

* As students enter room, greet each student by name and hand them a half sheet of paper with the bell ringer printed on it for students to sit down & begin working upon entering the classroom.
* Have bell ringer written on dry erase board so students write their answer in their science journals upon sitting down.

“Please write down three questions that you have on making biofuels from biomass.”

Facilitate discussion of students’ questions.

**Guest Speaker**

Possible alternative Location for presentation:

Beck Agricultural Center at Purdue's Agronomy Center for Research and Education, 4540 U.S. Route 52, West Lafayette.

Discuss with students this concluding project at the beginning of the school year and brainstorm with students about possible topics. Based upon students’ feedback, schedule a guest speak. Ideas are listed below.

Potential Speakers:

* Thomas Hertel, Agricultural Economics

765.494.4199 hertel@purdue.edu

* Wally Tyner, Agricultural Economics

765.494.0199 wtyner@purdue.edu

* Chad Martin, Renewable Energy Specialist at Purdue

765.496.3964 martin95@purdue.edu

* Representative from Indiana Biomass Energy Working Group

http://extension.purdue.edu/renewable-energy/indiana-biomass-working-group.shtml

* Maureen McCann, Biological Sciences

765.496.1779 mmccann@purdue.edu

Topics:

* Aviation and using biofuels
* Research at Purdue on biofuel development
* E85 and biodiesel

Ideas from:

http://www.purdue.edu/newsroom/releases/2012/Q4/aviation-biofuels-take-center-stage-at-biomass-energy-group-meeting.html

http://www.purdue.edu/newsroom/releases/2013/Q2/ag-economist-selected-for-inaugural-purdue-research-award.html

**General Procedure:**

A guest speaker will come in to give a presentation and to answer student questions on biofuels.

Guest speaker will give a short presentation to the class. Students have prepared questions for the speaker and the rest of the class period will be used for question and answers.

If time, guest speaker will review and offer feedback to student groups about their projects.

**Assessment:**

At the end of the class, students will do an exit ticket. This can be done in the students’ science journals as a reflection question or upon a separate half sheet of paper handed into the teacher to be used in assessing student understanding and progress in learning.

“What is one question that you still have about making biofuels from biomass?”