

	Week 1				
	Mon	Tues	Wed	Thurs	Fri
Activities Project Map	<p>Videos on energy crisis and biofuels (10 min)</p> <p>Talk about the role of biofuels in alleviation of crisis (10 min)</p> <p>Students start research on different biofuel crops (25 min)</p> <p>Exit ticket (5 min)</p>	<p>Class activity on sorting biomass/crops (30 min)</p> <p>Break into groups based on crop choice (5 min)</p> <p>In groups, start writing questions for farmer(s) (20-30 min)</p> <p>Exit ticket (2 min)</p>	<p>Gallery walk with questions for farmers (15 min)</p> <p>Graph interpretation activity (25-30 min)</p> <p>If time allows, students will be able to research.</p> <p>Exit ticket (2 min)</p>	<p>Brainstorm about constraints on farmers' profits</p> <p>Graphing constraints activity (30-40 min)</p> <p>Exit ticket (2 min)</p>	<p>Question/Answer session with farmer(s) (40-50 min)</p> <p>Exit ticket (2 min)</p>
Facilitation	<p>Present driving question to students after energy crisis video using the entry document.</p> <p>After the driving question, ask students to discuss their beliefs about the energy crisis based on the two videos.</p>	<p>After the class activity on biomass/crop activity, students will break into groups of 3 based on crop choice and begin creating the team charter.</p> <p>If some students don't have groups, encourage the students without groups to reach a</p>	<p>During the gallery walk with farmer questions, students should reflect on questions that were written as well as determine if there are other questions that should be added and/or modified.</p> <p>As students begin research, observe whether they are effectively finding good resources. If not, point them toward the</p>	<p>Have students discuss farmer constraints in small groups before having a full class discussion. Encourage students to try to come up with as many constraints as possible in their small groups.</p> <p>During class discussion, the teacher should write down all the groups ideas in a compiled list on the board. If time</p>	<p>Start the day by thanking farmers for their generosity in coming to the classroom</p> <p>The teacher will facilitate the discussion, first having farmers answer questions of their choice from the question bank, then selecting students to ask questions they deem important. Students should take notes during the discussion.</p>

		democratic consensus on crop choice.	research resource . At the end of the day teachers should compile the list of questions and send it to farmers along with the prepared questions .	allows, the teacher could encourage students to start thinking about the most important or influential of these ideas, which will be useful later in creating their presentation.	At the end of the day, the teacher should ask students to create something over the weekend to thank the farmers for their time.
Debriefing	<p>How did students chose what crops to research?</p> <p>Have students list important sources on the student generated sources document.</p> <p>How will students think about how they are going to answer the driving question?</p> <p>Students complete exit tickets</p>	<p>Debrief with students regarding what they learned from sorting biomass/crop activity.</p> <p>Students complete exit tickets</p>	<p>Have students share what they learned from the gallery walk.</p> <p>Students should state what they learned and what they can improve on.</p> <p>Students complete exit tickets</p>	<p>Have students share the positive and negative constraints during the brainstorming.</p> <p>Students complete exit tickets</p>	<p>Have students summarize that they learned from their presentation.</p> <p>Students complete exit tickets</p>
Assessment	Exit Ticket	<p>Homework assessment - Biofuels Crossword</p> <p>Exit Ticket</p>	Peer assessment -- Students examine other group's questions during gallery walk, formative assessment	<p>Homework assessment - Graphing constraints activity</p> <p>Exit Ticket</p>	<p>Summative Assessment -- Graded Group check in</p> <p>Exit Ticket</p>

Driving Question – Under what conditions (environmental & economical) should a farmer use his/her farm to produce a fuel crop?

Teacher Timeline

			through observation (IMMEDIATE FEEDBACK!!) Exit Ticket		
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	Week 2				
	Mon	Tues	Wed	Thurs	Fri
Activities Project Map	<p>Students research constraints (30 min)</p> <p>Start developing mathematical model for constraints (18 min)</p> <p>Exit ticket (2 min)</p>	<p>Best Fit Line Activity (40 min)</p> <p>Student Research (8 min)</p> <p>Exit ticket (2 min)</p>	<p>Student Research Day (48 min)</p> <p>Exit ticket (2 min)</p>	<p>Develop Presentation (48 min)</p> <p>Exit ticket (2 min)</p>	<p>Students present to a panel of farmers and/or agricultural extension office personnel (48 min)</p> <p>Exit ticket (2 min)</p>
Facilitation	<p>Students will work on their research including the constraints. Once the students have had a chance to look up the constraints, introduce how to model the constraints mathmatically.</p>	<p>Students will work through the Best Fit Line Activity while the teacher helps guide the students when needed. If time is left, students can continue with research.</p>	<p>Students will work on finishing their research. When students finish working on their research, they can work on developing their presentation.</p>	<p>Students will work on finishing their research. When students finish working on their research, they can work on developing their presentation.</p>	<p>Students will have 10-15 minutes to present their presentations. After each presentation, there will be a brief time (approximately five minutes) to answer questions and be given feedback on their presentations from their audience.</p> <p>At then end of the day, the teacher should pass out the group rubric, with the instructions that each student should fill out a row in the form for every member of the group (including themselves) based on the rubric at the top of the page.</p>
Debriefing	<p>Students reflect – what have you done, what do you need to do.</p>	<p>Students reflect – what have you done, what do</p>	<p>Students reflect – what have you done, what do</p>	<p>Make sure all students are clear about presentations</p>	<p>Have students share initial thoughts about how the presentations</p>

	<p>Have students list important sources they found on the student generated sources document.</p> <p>Students complete exit tickets</p>	<p>you need to do.</p> <p>Have students list important sources on the student generated sources document.</p> <p>Students complete exit tickets</p>	<p>you need to do.</p> <p>Have students list important sources on the student generated sources document.</p> <p>Students complete exit tickets</p>	<p>for tomorrow.</p> <p>Students complete exit tickets</p>	<p>went.</p> <p>Students complete exit tickets</p>
<p>Assessment</p>	<p>Exit Ticket</p>	<p>Homework assessment -- Best Fit Line Activity</p> <p>Exit Ticket</p>	<p>Exit Ticket</p>	<p>Exit Ticket</p>	<p>Group Evaluation -- Self and Peer Assessment</p> <p>Exit ticket</p>

	Week 3	
	Mon	Tues
Activities Project Map	Students present to a panel of farmers and/or agricultural extension office personnel (48 min) Exit ticket (2 min)	Final debriefing of project (30 min) Student surveys (20 min)
Facilitation	Students will have 10-15 minutes to present their presentations. After each presentation, there will be a brief time (approximately five minutes) to answer questions and be given feedback on their presentations from their audience.	Students will be given the rubric from their presentations and will be given time to reflect on their presentations. Other debriefing will take place as needed. After the debriefing, students will take surveys.
Debriefing	Have students share initial thoughts about how the presentations went. Exit Ticket	Have students share about how the presentations and the unit went. Student Survey
Assessment	Presentation Rubric Exit Ticket	