

NAME: _____

Aligned to the following standards:

FFA.PL-A; FFA.PL-F; FFA.PG-J; FFA.CS-N; CCSS.ELA.RI.9-10.2; CCSS.ELA.RI.9-10.4; CCSS.ELA.SL.9-10.2; CCSS.ELA.RST.9.10.9; CCSS.ELA.RST.9.10.4; MP1; MP5; MP6; CRP.02; CRP.04; CRP.05; CRP.06; CRP.07; CRP.08

Green Energy

Part 1

DIRECTIONS:

Watch the video "Abbigail Lozon – SAE – Micro Algae" to discover how this FFA member is learning firsthand about small photosynthetic organisms. The video is available at <https://vimeo.com/300298469>. As you watch, complete the activity below.

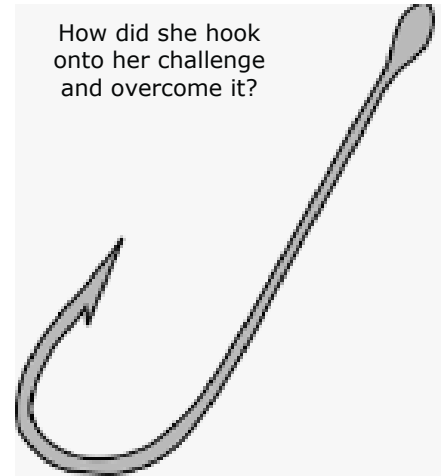
How many different types of algae does Abbigail grow?

What is the algae used for?

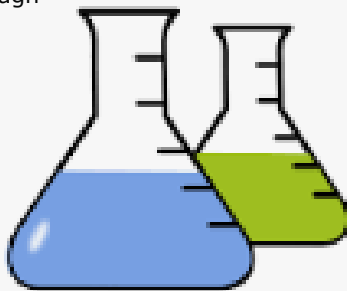


What was her biggest challenge?

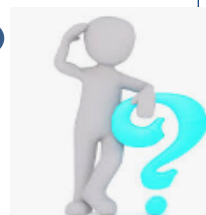
How did she hook onto her challenge and overcome it?



What skills did she gain through her SAE?



Aquaculture is a rapidly growing industry. What types of aquaculture are going on in your state?



Part 2

DIRECTIONS:

Algae and micro algae are great feed sources for some aquatic species. However, did you know this green plant can become an energy source as well? Using this website, <http://large.stanford.edu/courses/2014/ph240/anderson-m1/>, answer the following questions and complete the activities.

What is algal biofuel?

What role could micro algae play with regards to CO₂?

What are three benefits of using algae as a biofuel?

1. _____

2. _____

3. _____

Identify two challenges that impact the idea of algal biofuel as a viable source.

1. _____

2. _____

Cultivation Open Pond vs. Photobioreactor



DIRECTIONS:

Now that you have some background knowledge of algal biofuels, use the word bank below to create a flow chart of the process of algal biofuel production. Be sure to include pictures, with color, at each step. Remember that flow charts do not have to go in a straight line if there are multiple products, by-products, processing options or processes happening.

Word Bank:CO₂

Algae ponds

Carbs

Nutrients

Processing

Proteins

Sunlight

Biodiesel/Jet Fuel

Ethanol

Photobioreactor

Animal Feed

Bioplastics

Water

Algae Oil

Sequestration

What impact do you think algal
biofuel could have on your future?

Part 4

DIRECTIONS:

Now that you have an understanding of one new kind of biofuel, develop your own biofuel. Select a commodity that readily exists that have qualities favorable to producing another fuel source (corn and soybeans cannot be used). Identify the raw product, the growing procedures for processing, the steps for processing, the impact the fuel will have and any drawbacks to this specific type of fuel (ex. cannot be grown in certain regions).



Raw product: _____



Growing Procedures:



Steps in Processing:

Impact:



Drawbacks:

