

George Washington Carver: Alternative Uses for Everyday Materials

Background Information (Teacher Only)

The purpose of this mini project is for students to understand that traditional products may be made with alternative resources. You should assign each individual/group a different product to focus on. Students will evaluate the original material used to make the product and then research alternatives.

Remind students that the term “product” as used in these instructions means something like “plastic” not necessarily “plastic bottles” or it means “rubber” not necessarily “tires”. They can look at specific items made of their product if they want to extend their learning. Answering some of these questions may be very difficult for students and may require quite a bit of research. Also, please remember that these questions were written generically and may be easier to answer for one product than another product (ex. It may be easier to find answers for fuel then it is for dyes).

Potential products: (feel free to add to this list) plastics, rubber, fuel, dyes, medicine

Option 1: Worksheet

You can provide students with the questions and have them complete it as a worksheet. You can pick the product so everyone does the same thing, assign each group or individual their own product or let them pick their own.

Option 2: Mini-Project

Students will create a poster in the format as shown below. They will not need to copy the questions, but you might have them number their poster which will keep all the information in the same place for each student/group and make it easier to follow.

Option 3: Problem Based Learning

You can include this as a part of the Problem Based Learning Project, assigning one group to research this topic. George Washington Carver focused on alternative uses of soybeans (plastics and dyes), sweet potatoes and peanuts (oils, milk).

Accommodations for younger or lower level learners:

If you need to simplify the project for younger or lower level learners, you can focus on the bolded questions. I would encourage you to keep the summary for all learners but shorten the expected number of sentences or encourage bullet points.

On a separate sheet of paper each student will answer the following in their own words (you should write one paragraph per question, of 3-5 sentences each):

- **Which method of producing your product would you choose? Why?**
- **Summarize what you learned about alternative methods of producing common materials. Do you think the cost of using these materials is worth the benefit?**

PRODUCT NAME

Original Material

General Information:

1. How was the product originally produced?
2. What was the original use for the product?
3. When did production start?
4. Was the product successful immediately or when did it become highly successful?
5. How much of the product is produced yearly using this traditional method?
6. Is the material biodegradable?
7. How is the material used now?
8. What impact did the creation of this product have on the world?

Pros

What benefit does this product offer society?

How efficient is this product (i.e. how long can it last before being replaced)?

How much does it cost to produce?

Cons

What kind of pollution may be created by this product (air, soil, water)?

How does access to the source material impact the land?

How much does it cost to produce?

Environmentally Friendly Material

General Information:

1. What are the three (if you can find three) primary plants used to make this product?
2. Can you make products with 100% alternative material? (some products can only be a percentage alternative but still depend on the inclusion of original material)
3. How many plants does it take to make a standard amount of this product? (an acre of corn makes 300 gallons of ethanol)
4. When did production of this product using alternative methods begin?
5. How much of the product is produced yearly using this alternative method?
6. What percentage of the yearly production of this product is made using the alternative method?

Pros

Is the product that uses alternative materials biodegradable?

By using this material what pollution decreases?

How does a biodegradable product impact the environment when it is left as trash? (i.e. traditional plastic bottle vs. plant based plastic bottle in the ocean)

Cons

How long does this product last compared to the original method?

By using this material what is the impact on land use?

How does the source material impact other industries (i.e. price of corn)?