deSTEMber

SCIENCE ★ TECHNOLOGY ★ ENGINEERING ★ MATH

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# Space Plastics

Plastic bags take about 450 years to decompose! That is a long time to wait while they take up space in a landfill, which is why many stores no longer provide them when you check out. However, you can create your own plastic-like substance from biological materials to observe the different properties of each.

## TEKS:

SCI 4.1B: The student is expected to make informed choices in the use and conservation of natural resources and reusing and recycling of materials, such as paper, aluminum, glass, cans, and plastic.
SCI 4.5A: The student is expected to measure, compare, and contrast physical properties of matter, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float.
SCI 5.5D: The student is expected to identify changes that can occur in the physical properties of the ingredients of solutions, such as dissolving salt in water or adding lemon juice to water.
SCI 6.11C: The student is expected to describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.
SCI 6.5D: The student is expected to identify the formation of a new substance by using the evidence of a possible chemical change, such as production of a gas, change in temperature, production of a precipitate, or color change.

## Materials:

- 2-drops corn oil
- 1-Tbs. cornstarch
- 2-drops food coloring
- Microwave
- Sandwich size plastic baggie
- 1-Tbs. water

## How To:

1. Place the cornstarch, corn oil, water, and food coloring in the baggie and seal it shut.
2. Use your hands to squish the ingredients until they are mixed well.
3. Once the ingredients are mixed thoroughly, open the baggie to allow ventilation and microwave for 20-25 seconds.

 

4. When it is done, remove the baggie from the microwave very carefully, as it will be very hot.
5. Allow the bioplastic to cool, then remove it from the baggie to make observations and compare it to other plastics you have seen.

## STEM Explanation:

The cornstarch, water, and corn oil are all resources that can be easily replenished. These ingredients combine to make a hard plastic-like substance that is called a bioplastic. A bioplastic is a group of plastics made from biological materials like plant starches, cellulose, oils, or proteins. These bioplastics are biodegradable which means that they are capable of being broken down through the actions of living organisms and natural processes over time. Once you have made your own bioplastic, you should compare it to normal plastic and compare and contrast the pros and cons for each. Since these bioplastics are made up of plants, it creates an easy and affordable way to make plastics. Since corn is grown in plentiful amounts all over the country, the corn oil and corn starch, which are both a byproduct of corn, are very easy to obtain. Bioplastics can be easily created and do not use up valuable, hard to find resources.

## Career Connection:

*Research engineers* apply their expertise and knowledge to technical projects, finding innovative and affordable approaches to improve research, techniques, procedures, and/or products and technologies. These engineers develop, conduct, and evaluate new ideas to meet project goals faster and more efficiently.

## Resource:

https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=141&author_state=0&grade=3