What Can Kesler Science Do for You?

4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.

5E LESSONS

Two-week lessons with over 100 topics

ESCAPE ROOMS

Engaging activities for review

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Three different levels to fit every student

AMAZING ANCHORS

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Student-led exploration

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Real-world STEM problem-solving

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Exclusive Steve Spangler lessons and videos

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The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!

KESLER SCIENCE

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Name: _____

Date: _____

Plastic Eaters

Everywhere I look, I'm surrounded by a cheap, convenient material that can be molded to serve almost every purpose imaginable. The problem is... what happens to that plastic once we're done with it? Single use plastic bags and water bottles wind up in landfills and oceans, joining an estimated 12 million tons of plastic that reach the ocean each year. Once they get there, they stick around for a **really** long time. ⌛

Biodegradable materials break down into simple materials over time that enter the food chain for producers to use as they grow. When plastics start breaking down, they turn into **microplastics**, pieces of plastic smaller than 5 mm. Scientists are finding these microplastics everywhere, from the most remote ice sheets in Antarctica to the deepest ocean trenches.

Because there is so much of it, scientists are looking at creative ways to get rid of plastic waste. That includes recruiting bacteria and fungi that can **eat** plastics. 😮

One natural "plastic eater" was found floating in a plastic garbage patch in the Pacific Ocean! Scientists took the ocean fungus *Parengyodontium album* back to the lab, where they found that it can take the carbon atoms locked in plastic's long polyethylene chains and convert them into carbon dioxide.

A recent study of several strains of bacteria also found that 20% of them could break down plastic under the right conditions. That's a much higher number than we assumed years ago!

Scientists have also pinpointed the enzymes some bacteria use to digest plastic molecules. They're working on tweaking those enzymes through genetic modification to make them even more efficient.

One research team is using bacteria to build "self-destructing" plastics. These are industrial-grade materials that have plastic-eating bacteria spores blended right inside the polymer ingredients. When the plastic is sent to the landfill, nutrients in the soil signal the bacteria spores to start growing and breaking down the plastic. Incredible!

What about recycling efforts? They're a great idea, but, sadly, they haven't been very effective. The graph on the next page shows how the world ends up getting rid of most plastics.

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Plastic Eaters

1. What happens to most plastics?

_____

_____

2. Why could self-destructive plastics have so much potential?

_____

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3. "Lost" waste is officially called "mismanaged," which means it ends up burning in open pits or tossed into streams, rivers, and the ocean. Why is mismanaged waste a big deal?

_____

_____

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4. What is disappointing about recycling?

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Blog Link: https://blog.keslerscience.com/phenomenon-and-graphing/plastic-eaters-kesler-science-weekly-phenomenon-and-graph

Plastic Eaters

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What about recycling efforts? They're a great idea, but, sadly, they haven't been very effective. The graph below shows how the world ends up getting rid of most plastics:

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Plastic Eaters

1. What happens to most plastics?

   Most plastics end up in the landfill: about 50% in 2019 according to the graph.

2. Why could self-destructive plastics have so much potential?

   If most plastics end up in landfills, then bacteria that trigger when they make contact with soil could help a lot.

3. "Lost" waste is officially called "mismanaged," which means it ends up burning in open pits or tossed into streams, rivers, and the ocean. Why is mismanaged waste a big deal?

   Almost 25% of all plastic waste is mismanaged, so this is a huge source of pollution for the air (burning plastic) and water.

4. What is disappointing about recycling?

   Only about 10% of plastics are recycled. Even if this number doubled, it would not cover the "lost" category.

Plastics aren't going away any time soon, but maybe we can inspire the next generation to get creative with solutions!

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