



Tips for Helping a General Audience Understand Cleaner Materials

The goal of the “Making Stuff” outreach campaign is to help people appreciate and gain a better understanding of the material world. As you (or your invited speaker) prepare your 10- to 12-minute presentation, consider organizing your remarks so that the audience will leave understanding the **Big Ideas**. Use the **Conversation-Starter Questions** as a way to kick off a general discussion.

Big Idea #1: The energy and materials we use negatively impact the planet.

Each year, we extract some 30 trillion tons of raw materials from Earth. We burn fossil fuels to generate electricity and power cars; the combustion of fossil fuels releases harmful pollutants into the atmosphere. We turn iron ore into steel cars, petroleum products into plastics, and metals into batteries. What happens to all those raw materials when the useful life of our stuff ends?

Many of these materials end up in landfills or at the bottom of rivers, lakes, and oceans. For example, most plastics today are synthetic and made from petroleum; it can take hundreds of years or more for light, heat, or moisture to break them down in the environment. When they do degrade, some can leach harmful substances into the water or soil. However, it is possible to make a plastic made from natural materials that will break down more easily in the environment.

conversation-starter question: WHAT IF WE LIVED IN A ZERO-WASTE WORLD WHERE EVERY PRODUCT COULD BE RECYCLED, REUSED, OR COMPOSTED?

Big Idea #2: Scientists are creating cleaner alternatives to the energy and materials we use.

Materials scientists are working to invent cleaner technologies to help solve environmental problems created by the production and use of products such as automobiles, plastics, and batteries. These new advances could provide the energy and materials we need without polluting Earth. For example, bioplastic is biodegradable (unlike petroleum-based plastic); it can be made from plant and animal materials such as milk, cellulose, soy protein, hemp fiber, or flax fiber.

To get closer to a zero-waste world, we also need more sustainable means for energy generation and storage. For example, instead of relying on fossil fuels, which are a limited resource (and create pollution when burned), we could use renewable energy sources such as solar energy or biofuel. One of the biggest challenges with alternative forms of energy generation is how to store it; researchers are working on innovative ways to store energy, including developing new kinds of batteries and using chicken feathers to hold hydrogen fuel.

conversation-starter question: WHY WOULD A PLASTIC MADE FROM PLANT OR ANIMAL MATERIALS BE EFFECTIVE?