

Lesson 1: What do material scientists do?

Objectives:

1. Identify the goals of material scientists
2. Describe what a composite material and identify examples
3. Practice effective research skills



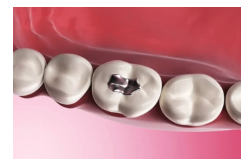
1. Activity: Scavenger hunt

Take a walk through the classroom or the school campus. List all the different materials you notice. Scrutinize the material each is made of. Is it a 'raw material', meaning it is naturally found on earth? Or is it a 'synthetic material', meaning it was made by humans?

<i>Object</i>	<i>Type of material</i>	<i>Raw or Synthetic material?</i>
<i>Example: chair</i>	<i>Plastic seat Metal legs</i>	Synthetic Raw

Introduction: material scientists

Many materials in today's world are specifically designed for their function. Material scientists play a part in finding out what combinations of materials can work in various industries. For example, as a material scientist, you may design an effective sunscreen that goes on clear, instead of leaving a pasty white residue on the skin. Material scientists are responsible for the invention of Kevlar®, which creates lightweight police vests, or fiber optic cables for the internet. It has a tensile strength that is ten times stronger than steel, but it is actually made of a synthetic material made from woven polymer fibers. Material scientists have also created safe resins (a bonding substance) that can be used as tooth fillings. These are a step up from tooth fillings from the past, which contained mercury as a bonding agent, a toxic metal.



Material scientists use chemistry to create synthetic (man-made) composite materials to serve a particular function. A composite material is a heterogeneous mixture of material designed for a particular purpose. Composite materials are popular today as alternatives to pure wood. Deforestation for centuries has taxed the environment and material scientists have found ways to make wood substitutes with byproducts instead. For example, fiberboard and particle board are heavily used in the furniture industry. Instead of being made of wood, they are made from recycled wood material like wood chips, bonded together with resins.



The Pueblo, Zuni and Hopi native american tribes in the Southwestern US mixed mud, straw and water to make Adobe houses. This mixture creates a composite brick that is sturdy and has great insulating properties, making them a popular choice for many civilizations throughout history. Adobe bricks can even be traced back to the Spanish in the 8th century BC!



2. Activity: Research some common composites

Use the CRAAP test following research tips to find quality sources.

Currency: When was the information last published or updated?

Relevance: Is the content at an appropriate level to understand? Does it directly relate to your topic?

Authority: What organization is the author affiliated with? How are they qualified to write on the topic?

Accuracy: Is the information supported by evidence?

Purpose: Is the purpose to inform, teach, sell, persuade, or entertain?



<i>Composite</i>	<i>Uses</i>	<i>What materials is it made of?</i>	<i>What is your source? (Place a citation here)</i>	<i>Evaluation of your source using the CRAAP test</i>
concrete	Construction			
plywood	Furniture			
asphalt	Paved roads			
fiberglass	Playground slides, body of a car, boats			
adobe	Construction			

3. Create your own mycelium composite

- a. Your teacher will distribute your mini bag of GIY material and mold.
- b. Follow [instructions provided](#) with your kit alongside your teacher.
- c. Be patient, as it will take several days to complete your mycelium composite form!

