

Name: _____ Hour: _____ Insulation Material: _____

“How It’s Made” Video Student Guide

Directions: Watch the “How It’s Made Video” assigned to you by your teacher and then answer the questions below.

1. What are the inputs or reactants used to manufacture the insulation material? Circle all of the ingredients below used for your insulation material.

- | | | | |
|-----------------|----------------------|---------------------|---------------------|
| Steel Slag | Cullet/Crushed Glass | Recycled Paper | Polystyrene Pellets |
| Coal (or Coke) | Sand | Crude Oil | Soda Ash |
| Chemical Binder | Natural Gas | Crushed Basalt Rock | Limestone |

2. Which of the reactants you identified above are natural resources? Which are synthetic? List each in the proper section below. Use the internet to research any of the material origins that were not explained during the video.

Natural Resources	Synthetic Materials

3. Below are several different processes used during the manufacturing of synthetic materials. Check off all of the processes that are involved in the manufacturing of your insulation material.

- | | | |
|--|---|--|
| <input type="checkbox"/> Color or Dyes Are Added | <input type="checkbox"/> Extract water with a machine | <input type="checkbox"/> Cut with Circular Saws |
| <input type="checkbox"/> Bleach materials | <input type="checkbox"/> Compress or Swish Materials | <input type="checkbox"/> Cut with high precision water jets |
| <input type="checkbox"/> Heat in furnace or oven | <input type="checkbox"/> Move Materials on a Conveyer Belt | <input type="checkbox"/> Cut with electrically heated copper-nickel wire |
| <input type="checkbox"/> Mix Ingredients | <input type="checkbox"/> spinning machine whips material thin strands | <input type="checkbox"/> Brand with Ink |
| <input type="checkbox"/> Magnet used to remove metals | <input type="checkbox"/> Shred materials | <input type="checkbox"/> Package in Plastic Bag |
| <input type="checkbox"/> Create a Paste | <input type="checkbox"/> Polymerization | <input type="checkbox"/> Requires energy |
| <input type="checkbox"/> Expand materials in steam chamber | <input type="checkbox"/> Mold materials | <input type="checkbox"/> pass quality control inspection |
| <input type="checkbox"/> Debark Wood | | |

4. Do you think the 'How It's Made' Videos are reliable and accurate sources? Explain your answer.

5. What are there other 'outputs' or products created during the manufacturing process other than the insulation material? (i.e. wastewater, excess materials, exhaust gases, etc).

6. Using your answers from 1 and 4 create a simple chemical equation for the production of your insulation material in the space below. For example a simple chemical equation for flubber would be: borax + glue + water \rightarrow flubber.

7. How do the properties of the reactants compare to the final product? (the student should be able to use their properties cards from lesson three)

8. Did a chemical reaction occur during the manufacturing process? Be sure to include evidence from the video to support your answer.

9. Is your insulation material a synthetic material? How do you know?