



Comparing Outdoor Furniture

NAME _____

GROUP MEMBERS _____

Instructions: As you listen to the play or to the student presentations, collect information about the following questions.

Plastic Resin Furniture Set

1. What are the basic raw material inputs necessary to produce polypropylene and other plastic resins?

Aluminum Furniture Set

2. When processing aluminum, most of the emissions are the result of which step?

3. How many times can aluminum be recycled?

Pine Furniture Set

4. When calculating emissions over time, why isn't the carbon dioxide emitted from wood burned for power during the manufacturing process included?

Summary

5. Which furniture type would be best for your school? Why?

6. If every school in your state purchased this type of outdoor furniture, what might the short and long-term impacts be?



Greenhouse Gas Emissions Tables

Use the tables below to keep track of the greenhouse gas emissions associated with each step of the life cycle.

Remember: CO₂ = Carbon dioxide CH₄ = Methane N₂O = Nitrous oxide kg = kilogram

Plastic Resin Set

Stage of Life Cycle	CO ₂ Emissions (kg/set)	CH ₄ Emissions (kg/set)	N ₂ O Emissions (kg/set)
Oil and Natural Gas Extraction			
Refining Oil/Processing Natural Gas			
Manufacturing Polypropylene			
Manufacturing Plastic Furniture			
Use			
Disposal			
TOTAL EMISSIONS			

Cast Aluminum Set

Stage of Life Cycle	CO ₂ Emissions (kg/set)	CH ₄ Emissions (kg/set)	N ₂ O Emissions (kg/set)
Bauxite Mining (for 1/2 Primary Material)			
Processing Aluminum (1/2 Primary and 1/2 Secondary)			
Furniture Manufacturing			
Use			
Disposal (Recycling Aluminum)			
TOTAL EMISSIONS			

Pine Set

Stage of Life Cycle	CO ₂ Emissions (kg/set)	CH ₄ Emissions (kg/set)	N ₂ O Emissions (kg/set)
Sustainable wood production			
Wood Processing/Lumber production			
Pressure Treatment			
Furniture Manufacturing			
Use			
Disposal			
TOTAL EMISSIONS			



Global Warming Contribution Calculation

After you have recorded the greenhouse gas emissions from each step and totaled the results, there's still one more step before you can decide which furniture set will have the highest impact on climate change. Not all greenhouse gases are equal. Some gases are able to capture more energy than others. For example, a kilogram of methane in the atmosphere will trap about 25 times more energy over a 100-year period than a kilogram of carbon dioxide. Therefore, it is said to have a global warming potential of 25. When scientists measure the impacts of greenhouse emissions, they often use the term "carbon dioxide equivalents." This is the basic unit for measuring the global warming potential of emissions. Since 1 kg of methane traps as much heat as 25 kilograms of carbon dioxide, that 1 kilogram of methane has a global warming potential of 25 kilograms of carbon dioxide equivalents. Now you can calculate the global warming potential of each of the three furniture sets. Use the following table to calculate the emissions for each dining set.

Calculating the Global Warming Contribution of Greenhouse Gas Emissions

Gas	Emissions (kg)	Global Warming Potential (100-year period)	Carbon dioxide Equivalents (kg CO ₂ -eq)
Plastic Resin Set			
Carbon dioxide		x 1	
Methane		x 25	
Nitrous oxide		x 300	
TOTAL			
Aluminum Set			
Carbon dioxide		x 1	
Methane		x 25	
Nitrous oxide		x 300	
TOTAL			
Pine Set			
Carbon dioxide		x 1	
Methane		x 25	
Nitrous oxide		x 300	
TOTAL			