

Topic	Science	Science	Science
Question	ALL PLAY: Alternate between teams and list off examples of feedstocks for 1st generation biofuels. The team that gets stuck or repeats an example does not receive the Genius Card.	ALL PLAY: Alternate between teams and list off examples of feedstocks for 2nd generation biofuels. The team that gets stuck or repeats an example does not receive the Genius Card.	ALL PLAY: Alternate between teams and list off examples of feedstocks for 3rd generation biofuels. The team that gets stuck or repeats an example does not receive the Genius Card.
Answer	A fuel source derived from starch, sugar, animal fat, and vegetable oil such as corn, sugarcane, canola oil, etc.	A fuel source manufactured from biomass, like poplar trees, switchgrass, sawdust, wood slash (waste wood from forest harvesting).	A fuel source manufactured from algae biomass for example pond skum, kelp, etc.

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ALL PLAY: Have each player on your team touch an item in the room that could be made from bioresources. Each team member must participate and all must touch a different object to receive the Genius Card.	Name the crop you feel is the best renewable energy resource and why.	Describe why fermentation is being explored as a process to make biofuel.	What does E85 mean?
Examples: water bottle, plastic bag, plastic computer case, table, chair, electricity from wall socket, etc.	Anything wins as long as it is related to bioenergy and has accurate reasoning.	Because fermentation turns a substance, like corn, into an ethanol that can be used as gasoline.	The substance is 85% ethanol

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ALL PLAY: Have each person on each team name green alternatives could you use or do everyday. Each correct answer equals one point for your team. The team with the most points receives the Genius Card.	Fossil fuels create greenhouse gases. What are the two most common greenhouse gases in the Earth's atmosphere?	Trace an energy source in the room all the way back to the sun.	Which will allow you to travel farther: one gallon of gas or one gallon of ethanol?
Examples: biodegradable plastic, non gasoline car to school, ride a bike, turn down heat, turn down A/C, eat more vegetables, etc.	Carbon dioxide and water vapor.	Example: Sun, ocean plant, natural gas after buried, pumped to school, burned in boiler, hot air from vent.	One gallon of gas

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Which form of energy is most abundant on the earth?	What is the conservation of energy? Give a bioenergy example.	How can advanced biocrops (2nd or 3rd generation) keep from using soil that is normally used for food?	What is a calorie? How is it useful to bioenergy scientists?
The Sun	The law states energy is not created nor destroyed only transferred. An example is changing from. Algae to gasoline does not create energy, it only converts it from one form to another.	They grow in soils too poor for food crops such as deserts.	A calorie is a measure of the energy needed to raise the temperature of 1 gram of water through 1 °Celsius. This can help bioenergy scientists determine how much energy a certain fuel has by burning it, like we do in our cars.

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ALL PLAY: Have each person on both teams name a benefit to alternative fuels. Each correct answer equals one point for your team. The team with the most points gets a Genius Card.	Fossil fuels create greenhouse gases like carbon dioxide. Is this the most common gas in the atmosphere? If not, what is the most common gas in the atmosphere?	Multiple Choice: Cows help create a type of biofuel through digestion. They eat grass and turn it into butter, which can be burned. How many stomachs does a cow have? A. 7 B. 9 C. 5 D. 4	Name three ways thermal energy is transferred.
Examples: can be regrown, requires less resources like water and pesticides, can be made and produced here instead of overseas, reduces CO2, replaces oil, employs more farmers, etc.	No, nitrogen is the most common gas.	D. 4 stomachs.	Radiation, conduction, convection.

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Does renewable or non-renewable energy make up a majority of the United State's energy use?	What types of life on earth generate carbon-dioxide?	(T/F) Carbon-dioxide destroys the ozone layer.	What environmental impact is fossil fuel use creating?
Non-renewable energy.	Animals.	False. CFC's destroy the ozone layer.	More carbon dioxide in the air, warmer global temperature.

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What percentage is carbon-dioxide of the atmosphere?	What environmental impact is fossil fuel use creating?	Name three chemical elements that are common in bioenergy fuels, like ethanol.	
0.04% or less than 1%.	Increases CO2 in the atmosphere.	Carbon, hydrogen, oxygen.	

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