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### Lesson 3.3 Can biofuels help with the global climate change problem?

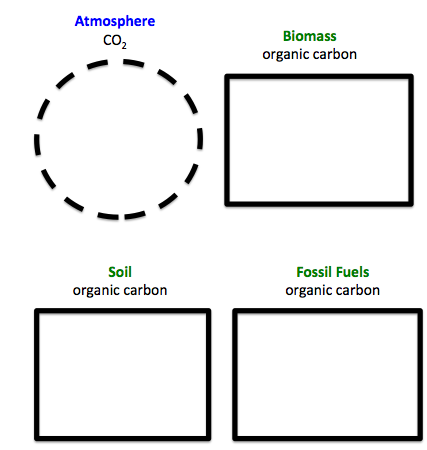
## A first approximation

Can substituting ethanol made from plant material instead of gasoline slow the increase in atmospheric carbon dioxide?

1. Let’s compare the production and combustion of fossil fuels to the production and combustion of biofuels. More specifically, let’s compare the use of gasoline to the production and use of ethanol.

|  |  |  |  |
| --- | --- | --- | --- |
|  | What carbon pools are involved? | How are carbon atoms moving btw pools? | How is energy flowing? |
| Extraction of crude oil & gasoline production |  |  |  |
| Combustion of gasoline in a vehicle |  |  |  |
| Growth of corn (photosynthesis) |  |  |  |
| Production of ethanol from corn |  |  |  |
| Combustion of ethanol |  |  |  |

1. On the diagram below, draw and label arrow for each process in the chart above showing where the carbon moves during that process. Draw all of the arrows associated with gasoline in one color. Draw all of the arrows associated with ethanol in a different color



1. Explain why you think substituting ethanol made from plant material will or will not help slow the increase in atmospheric carbon dioxide. Support your conclusion with information from questions 1 and 2.
2. Combustion of biofuels such as ethanol produces carbon dioxide in the same way that combustion of fossil fuels like gasoline does. Why is it that people think that biofuels will be helpful in slowing the increase in atmospheric carbon dioxide?