

Activity 5.4: Explaining Combustion of Octane

Read about gasoline and octane, then answer the questions below.

1. Explaining how octane burns. Write a paragraph about how octane burns inside a gasoline engine and makes a car move. Be sure to answer the four numbered questions on your Three Questions handout.

2. A new kind of engine? An inventor says that she has invented a new kind of engine that makes gasoline instead of using it up. A scientist weighs the gas in the tank, then drives the car around for a day. Here is what she found.

Original mass of the gasoline: 12.5 kilograms

Mass of the gasoline after one day: 13.1 kilograms

- A student, Patrick, claims: "It might be possible to have an engine with backwards combustion, so it takes in CO₂ and H₂O and produces gasoline and oxygen, instead of the other way around."
Circle one: AGREE DISAGREE
- Another student, Joaquin, claims: "Driving around might warm up the gasoline, so it would expand and gain mass."
Circle one: AGREE DISAGREE
- Another student, Devin, claims: "It is impossible for the engine to get energy from the gasoline without burning some of it, so someone must have secretly added gasoline to the tank."
Circle one: AGREE DISAGREE

Explain your reasoning for your choices.

Choose ONE claim above that you agree with. Explain how this claim could be further tested to offer evidence that better supports the claim.

3. What happens to matter when octane burns? After a car runs for a while, the gasoline in its tank weighs less. What happened to some of the matter that used to be in the gasoline? Select True or False for the following statements.

Some matter from the gasoline *was converted into*:

- T F *motion energy*
- T F *carbon dioxide*
- T F *heat energy*
- T F *water vapor*

Which ONE of the following do you think MOST of the matter in the burning gasoline was converted into?

- a. Motion energy
- b. Carbon dioxide
- c. Heat energy
- d. Water vapor

Explain your choices. What happened to the matter in the gasoline as it burned?

4. Something interesting about Octane

What is something interesting that you learned about Octane?
