**Fuel Alternatives Bill Nye (In the Garage)**

**Intended Benefits & Untended Consequences 9:47**

1. **Bill Nye asked what do garages have in common. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **Since many of products are made from oil, and we have used nearly ½ of our supplies of oil in 150 years, what were the 3 alternatives for oil? Gas-\_\_\_\_\_\_\_\_\_\_\_ Hybrid cars, \_\_\_\_\_\_\_\_\_\_\_\_\_ Fuel Cell Cars, and Corn as a Biological \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **This Biofuel cure may be \_\_\_\_\_\_\_\_\_\_\_\_ than its disease.**
4. **Bio fuel is made from \_\_\_\_\_\_\_\_\_\_\_\_, like sugar, sugar beets, potatoes, algae, switch grass, and especially corn.**
5. **When the sugar in plants is mixed with an enzyme like yeast it will produce a fuel/alcohol called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
6. **Ethanol is a great \_\_\_\_\_\_\_\_\_\_\_, it is a \_\_\_\_\_\_\_\_\_\_\_\_\_ burning, can use in almost all cars and trucks.**
7. **Yet, there are some \_\_\_\_\_\_\_\_\_\_\_\_\_ consequences from a Bio fuel called E85 (Contains 15% Gas and about \_\_\_\_\_\_\_\_% corn Ethanol).**
8. **Today we can make \_\_\_\_\_\_\_ gallons of E85 from \_\_\_\_\_\_\_\_\_ bushel of corn.**
9. **Resulting in about \_\_\_\_\_\_\_\_\_billion gallons E85 being made a year.**
10. **Unintended \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (downside): Energy required to make on gallon of E85 is about \_\_\_\_ gallons of gasoline, 1 acre of corn yields \_\_\_\_\_\_\_\_ gallons of E85 which means we would have to use \_\_\_\_\_\_\_\_% of Farmland to E85 that would replace 10% of the regular gas usage.**
11. **Even more unintended consequences: Corn erodes soil \_\_\_\_\_\_\_\_\_\_ times more faster than soil can regenerate.**
12. **Next \_\_\_\_\_\_\_\_% of all corn is chemically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with fertilizer, herbicides, & pesticides, which are all made from fossil fuels.**
13. **Many believe the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ corn production to Ethanol make is increasing our food \_\_\_\_\_\_\_\_\_\_\_, because there is less food for humans and livestock.**
14. **Possible solutions: Use \_\_\_\_\_\_\_\_\_\_ but would need lots of fertilizers & pesticides that would lead to a lot of \_\_\_\_\_\_\_\_\_\_ run off during heavy rains.**
15. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ could be used and would produce \_\_\_\_\_\_\_\_\_\_\_\_\_ gallons per acre, of E85 compared to the 400 gallons per acre with corn, but requires very little water.**
16. **Algae has been genetically \_\_\_\_\_\_\_\_\_\_\_\_to produce petroleum and gasoline directly.**
17. **Jim has modified his car to run on used waste cooking \_\_\_\_\_\_\_\_\_\_. Currently we discard \_\_\_\_\_\_\_\_ billion gallons of waste oil per year.**
18. **This waste oil is \_\_\_\_\_\_\_\_\_\_\_, yet restaurants have to \_\_\_\_\_\_\_ to dispose this waste oil.**
19. **In colder climates Vegetable oil is too \_\_\_\_\_\_\_\_\_\_\_ to atomize so you would to have a \_\_\_\_\_\_\_\_\_\_\_\_\_ fuel tank for diesel fuel to help start your vehicle.**