# Fuel Comparison Worksheet (8th ed. of text)

Complete this worksheet by supplying for each fuel, the missing molar masses, % C, H, and O, and the kJ of energy released per gram of fuel that burns. Set your printer to Landscape mode to print this page.

| Combustion fuel | Molar mass of fuel | C % (w/w) | H % (w/w) | O % (w/w) | kJ released per mole of fuel burned | kJ released per gram of fuel burned (p 173) |
|---|---|---|---|---|---|---|
| **carbohydrates** | | | | | | |
| $C_6H_{12}O_6$ (glucose) | | | | | 2800 | |
| $C_{12}H_{22}O_{11}$ (table sugar) | | | | | 5640 | |
| $C_2H_5OH$ (ethanol) | | | | | 1370 | |
| wood | --- | typical carbohydrate | | typical carbohydrate | --- | 10-15 |
| **coal** $C_{135}H_{96}O_9NS$ | | | | | --- | 30 |
| **oil/natural gas** | | | | | | |
| $C_8H_{18}$ (gasoline) | | | | | 5450 | |
| $C_2H_6$ (nat. gas) | | | | | 1560 | |
| $CH_4$ (nat. gas) | | | | | --- | 50 (p 173) |
| **hydrogen, $H_2$** | | | | | 240 | |

Provide answers for the following questions, using your completed table and information from Sec. 4.3-4.9.
Defend your answers below with clear reference to information from your completed table above.

1. Why is energy per gram important for comparing fuels?

2. What effect does higher O content have on energy per gram?

3. Why is energy per mole so different for each fuel?

4. Which fuel will produce more $H_2O$ and less $CO_2$?

5. Which fuel is likely to produce undesirable pollutants?

6. What advantage does a higher O content offer?