Science 30	Unit D: Energy and the Environment
Lesson 8 - 1.3 Review	84 mins

Science 30 - Lesson 44 - Unit D - 1.3 Review

Name: _____

Knowledge

1) Identify the energy source used to generate the majority of Alberta's electricity.

2) Name the type of energy present within fossil fuels.

3) Identify the type of chemical reaction used to release the energy stored in fossil fuels.

4) Write the formula used to calculate energy change for a combustion reaction using standard heats of formation. Identify each variable in the formula.

5) Define heat of combustion and standard heat of formation.

Applying Concepts

6) Explain how the combustion of a hydrocarbon causes a change in potential energy.

7) Describe the result of a change in potential energy during a chemical reaction.

8) Draw an energy diagram for an exothermic process indicating the position of the reactants, products, and net energy change.

9) A natural gas-fired generating station uses 2.5 MJ of heat from the combustion of methane.
    a) Calculate the station's energy efficiency if 1.3 MJ of electrical energy is generated.

    b) Compare this to the typical efficiency of a coal-fired generating station.

10) For thousands of years, the Inuit traditionally relied upon animal power for transportation. In the 1970s, gasoline-powered snowmobiles replaced dogsleds as the primary mode of transportation for Inuit in the Arctic during the winter months.
    a) Write the balanced combustion reaction for octane, $C_8H_{18(l)}$, the main component of gasoline.

    b) Use standard heats of formation to calculate the heat of combustion for octane.

11) For millennia, Inuit people have burned seal and whale blubber as sources of heat and light. Design an experiment that could compare the heat of combustion of seal blubber with that of whale blubber. Your design should include a problem statement; manipulated, responding, and controlled variables; a diagram of the apparatus you will use; and a data table showing the information you wish to measure and record.