Chapter 15 “Scavenger Hunt”

**15.2 OIL**

Define these terms:

Crude Oil/petroleum

Peak production

Refining

Petrochemicals

Proven oil reserves

Horizontal drilling

Fracking

OPEC

Natural gas

Oil shale rock

Tar sands

Bitumen

IEA

Questions:

1. Why do you think horizontal drilling allows better access to tightly held oil and natural gas deposits than does drilling vertically into such deposits?
2. Map out the 12 countries that make up the OPEC and label their percentage of oil reserves.
3. Thinking of conventional light oil as an energy resource, which single advantage and which single disadvantage do you think are the most important and why? Do the advantages outweigh the disadvantages? Explain.
4. Create a pro/con list of oils derived from different sources.
5. Thinking of heavy oil from tar sands and from oil shale rock as an energy resource, which single advantage and which single disadvantage do you think are the most important and why? Do the advantages outweigh the disadvantages? Explain.

**15.3 Natural Gas**

Define these terms:

LPG

LNG

Natural gas

Coal bed methane gas

Methane hydrate

Questions:

1. Create a pro/con list of oil vs. natural gas \*be sure to rank which is more available, the net energy of each, production costs and environmental problems.
2. Rank the three largest producers of natural gas in order of total production.
3. Why has natural gas production risen sharply in the US and what two factors could hinder this rise?
4. Describe 5 major problems resulting from increased use of fracking to produce natural gas in the US, and six solutions.

**15.4 Coal**

Define these terms:

Coal

Fossil fuel

Knoxville, Tennessee 2008

Wet slurry

Coal ash

Pulverizing mill

Bituminous

Lignite

Anthracite

Peat

SNG

Coal gasification

Coal liquefaction

synfuels

Questions:

1. Copy fig. 15-14 into your smashbook/notes.
2. How is coal formed?
3. What is the clean coal campaign? Explain why there is no such thing as clean coal.
4. According to Fig. 15-17, Which of these produces more CO2 emissions per kilogram: burning coal to heat a house, or heating with electricity generated by coal?
5. What three countries have the largest proven reserves of coal?
6. Compare and contrast SNG vs coal
7. Compare and contrast coal vs natural gas vs oil.

**15.5 Nuclear Power**

Define these terms:

Nuclear fission

Nuclear fusion

Fuel rods

Control rods

Fuel assemblies

Coolant

Containment shell

Nuclear fuel cycle

Decommissioned

Radioactive

Nuclear waste

Fukushima Daiichi 2011

Questions:

1. How does a nuclear fission reactor work?
2. Diagram fig. 15-22
3. Do you think the market price of nuclear-generated electricity should include all the costs of the nuclear fuel cycle, in keeping with the full-cost pricing principle of sustainability?
4. Do you favor measures to provide better protection for spent fuel rods, even if they would raise the cost of electricity? Explain.
5. Would you be willing to live within a block or two of spent-fuel rod casks or have them transported through the area where you live in the event that they were transferred to a long term storage site? What about within 40 miles? Explain.
6. What and where is the nearest nuclear power plant? How many miles it that? Are we in the fall-out zone if a nuclear disaster would happen?
7. Thinking of nuclear power as an energy resource, which single advantage and which single disadvantage do you think are the most important and why? Do the advantages outweigh the disadvantages? Explain.
8. Do you think the benefits of nuclear power justify high government (taxpayer) subsidies and tax breaks for the nuclear industry? Explain.
9. Compare and contrast nuclear fission and fusion as a power source.