

Introduction

1. What is meant by growth?
2. Who was Thomas Malthus and what idea did he formulate about resource use vs population growth?
3. What role does population growth have on our use of energy?
4. Why has population growth during the last 200 years defied Malthusian principles?
5. What is the difference between political and energy time?
7. Why is the media so inept at reporting energy news?

Science

1. What is science?
2. List five traits that characterize a scientist.
3. What are the four basic questions scientists ask when they are attempting to explain a phenomenon?
4. What is the scientific method?
5. What is meant by “multiple working hypotheses”?
6. Discuss the reasons why becoming emotionally involved in a scientific discussion can lead to ethical dilemma.
7. How had the role of the media altered how scientists operate? Include both the positive and negative aspects.
8. Discuss the reasons why scientists use words like “suggests,” “may,” “could,” “might,” or other equally fuzzy adjectives to describe their work.
9. What are good and negative aspects of the media in science?

Energy

1. What was the cause of these first oil crises of the early 1970's?
2. How did Thomas Edison affect the use of oil at the end of the 19th century?
3. What was Henry ford's role in the use of oil at the beginning of the 20th century?
4. How did the Texas Railroad Commission control oil prices?

7. After the energy crisis at the beginning of the 1970's, why did the United States fail to make change in our use of oil?
7. What is meant by energy density, and how does oil compare to other energy source with respect to energy density?
9. Energy usage may be divided into two categories. What are these two categories?

Origin of Oil

1. What biological organisms from the building blocks for petroleum, where do they live, and where do they get the energy that is stored and released when we burn petroleum.
2. What are hydrocarbons? How many carbon atoms are contained in hydrocarbons that form gases, liquids and solids?
3. What is meant by "the oil window".
4. What are porosity and permeability and how do they relate to oil traps and reservoir rocks.
5. How are the gas cap, oil leg, and water leg organized vertically in a petroleum reservoir? Why does this happen?
6. What is reservoir pressure, and how is it controlled?
7. What do the terms sour and sweet mean with respect to crude oil?
8. What is °API and how does it relate to the terms heavy and light crude?

Exploration (onshore and offshore)

1. What is meant by the term wildcat well?
2. What is an oil seep?
3. What is the difference between a structural and stratigraphic trap? What features do they have in common?
4. What was Drake's contribution to the history of the oil industry?
5. Subsurface exploration is based on seismic surveys. Describe how seismic profiling works.
6. Why is the Gulf of Mexico such a prolific oil producing region?
7. How is a salt dome formed?
8. What is a jack-up drilling rig?
9. Why is 3-d seismic profiling important to exploration in the Gulf of Mexico?

10. What are some of the hazards that offshore drilling and production platforms have to deal with day-in and day-out?
11. Why is damaging of onshore refiners by a hurricanes central to gasoline price spikes?
12. What is a fault trap and how does it differ from an anticlinal trap?
13. What is the biggest hazard to oil production in the Gulf of Mexico and how has it impacted oil prices in the last ten years.

Leasing and Drilling

1. What is the difference between surface and mineral rights?
2. What are the basic types of international leases?
3. What is the “rule of capture”?
4. What is the blowout preventer?
5. What is the importance of drilling mud when drilling an oil well?
6. What is horizontal drilling?
7. What are the benefits of horizontal drilling?
8. Discuss the three major ways crude oil is transported to a refinery and the advantages and disadvantages of each.
9. Why is distillation considered to be foundation of refining crude oil into the petroleum products?
10. Why are reservoirs important to producing oil?
11. Briefly describe the three geological features needed to form a producing oil field?

Transportation and Refining

1. Discuss the three major ways crude oil can be transported to a refinery and the advantages and disadvantages of each.
2. Why is distillation considered to be the foundation of refining crude oil into petroleum products?

3. What is meant by “cracking” in the refining in process?
4. Why is it that after the cracking process that you have more volume of products than you started with?
5. How are refined products transmitted in a pipeline?
6. What is the Strategic Petroleum Reserve, and why was it was created?
7. Why would a politician be tempted to release oil or heating oil from the SPR?
8. What is a reserve? Your answer should include the difference between recoverable and unrecoverable oil and what percentage of oil is typically produced from an oil field.
9. Define “proven reserves.”
10. What is a fully integrated oil company?

Gasoline

1. What is the difference between summer and winter blends of gasoline?
2. What is reformulated gasoline and why do certain regions of the country need to use this type of gasoline?
3. While RFG gasoline provides a number of benefits, they also present problems to the refining and distribution segments of the oil industry. What are these problems?
4. No new refineries have been built since the early 1970’s and a number of these have been shutdown, yet our ability to produce gasoline has increased. How?
5. What are the reasons for the large difference in the price of gasoline in different regions of the country and certain states, when there has been no supply disruption?
6. How does a small retailer make any money running a gas station?
7. What are some of the factors that retailers have to consider when deciding on how much to charge for his gasoline?
11. Where is the greatest profit generated in the oil industry?
12. What are the pros and cons of ethanol as an additive to gasoline?

OPEC

1. What factors have played a role in the price of oil since its initial discovery to the present?

2. What was the significance of the Achnacarry Agreement in 1928?
3. Why did the major oil companies “hold all the cards” and could dictate the terms for the production of oil in producing nations?
4. What role did the United States and England play in the putting the Shah in power Iran in 1953?
5. What was the basic agreement between President Roosevelt and King Saud in 1945?
7. What is meant by “posted price” of oil during the 1950’s and how did it affect the producing nations?
8. What are the basic requirements for a successful cartel?
9. Why has OPEC had so much trouble maintaining their production quotas?
10. Why did price controls initiated by the federal government in the early 1970’s make us more dependent on imported oil?
11. Why did the United States fail to institute significant energy conservation measures until the “second oil crisis” in the late 1970’s?
12. What led to the significant increase in “oil reserves” in the OPEC nations during the mid-1980’s?
13. What is meant by the phrase the “lost decade” in the developing nations of the world?

Questions from Readings

- 1) Did Darwin use the scientific method or the Baconian Method in developing the theory of evolution? What did he write about how he developed the theory, and why did he do so.
- 2) In the paper “Impact of population growth,” by Ehrlich and Holdren outline and discuss the five theorems related to population growth. What are these five theorems?
- 3) What is the purpose of the API report “Putting Earnings into Perspective”?
- 4) In the paper “The temperatures of oil and gas formation in the subsurface,” Quigley and Mackenzie develop a kinetic model for petroleum maturation which supersedes prior models for oil and gas formation based on the Lopatin approach. What range of temperatures do Quigley and Mackenzie infer that most oil forms in? What about gas? What do they conclude about are the primary limitations Lopatin approach?
- 5) In the Congressional Research Service report to congress, a great deal of emphasis is placed on development in ‘OCS’ areas. What does OCS refer to, why is it the focus of much of the report, and what are the major challenges for petroleum development in the OCS.
- 6) In “Two cheers for expensive oil”, Maugeri argues that current oil and gas prices are not the result of dwindling supplies. What does Margeri argue are the primary causes of today’s high oil prices?