

Name _____ Date _____ Hour _____

Natural Resources – Coal WS

Use the American Coal Foundation website found at <http://www.teachcoal.org> to assist in answering the following questions:

Click on the *Coal Energy Facts* tab, then select *Frequently Asked Question About Coal*:

1. Define Coal - _____
2. Coal, like any fossil fuel, can be burned to release _____.
3. Coal contains elements such as H, O, and N, and various amounts of minerals; and itself is considered to be a mineral of _____ origin.
4. Scientists believe that during the _____ period (280 to 345 million years ago) large amounts of plant life and other organic matter grew in the _____ areas and lagoons that covered much of the Earth.
5. As plants and other life form dies, they drifted down to the bottom of the swamps, slowly decomposed, and formed _____ -- a soggy, spongelike material.
6. Peat became buried and compressed over millions of years through the forces of heat and pressure so that the peat became _____.
7. The greater the heat and pressure, the _____ the coal was that formed.
8. What are the four major categories of coal? List them in order of soft to hard and write the chemical/physical properties of each.

9. The country with the largest coal reserves (~24%) is _____.
10. Coal is found in _____ states in the U.S.
11. Coal reserves account for _____ % of U.S. fossil fuel reserves.
12. The recoverable coal reserves in the U.S. could last us more than _____ years if we continue using coal at the same rate as we use it today.
13. The U.S. has more than _____ % of the world's estimated coal reserves.
14. To meet energy and metallurgical needs, the United States mines over _____ billion tons of coal a year.
15. Explain the two methods for mining coal:
16. _____ underground mining uses explosives to break up a coal seam.
17. _____ underground mining uses machines with large rotating cutters that break into the coal and with arms that scoop the coal onto a built-in conveyor.
18. _____ underground mining uses cutting machines that work along walls of coal up to 1000 feet long to cut coal and drop it onto a conveyor belt.
19. _____ is the process of protecting, restoring, and possibly even improving the land before, during, and after surface mining (not just coal mining, but any type of mining).
20. Coal is primarily used to _____.
21. Manufacturers and industries use coal to make chemicals and other products while coal's methanol and ethylene are used as feedstocks to make products such as plastics, medicines, fertilizers and tar.
- a. Write the chemical formula for methanol and draw the expanded structure for methanol:

- b. Write the chemical formula for ethylene (or ethene) and draw the expanded structure for ethene:

22. Coal is used to generate electricity because it is a reliable and _____ energy source produced in compliance with our nation's environmental laws (*according to American Coal Council*).
23. Nearly 60% of all coal is transported by _____.

Click on the *Coal Energy Facts* tab, then select *Fast Facts About Coal*:

24. The United States produces about 20%, or 1.1 billion tons, of the world's coal supply—second only to _____.
25. Coal generates about _____ of the electricity used in the United States.
26. _____ is the state with the most coal reserves (119 billion tons). But _____ is the top coal-producing state—it produced about 400 million tons in 2004.
27. U.S. coal deposits contain more _____ than that of all the world's oil reserves.

Use the Kentucky Coal Education website found at <http://www.coaleducation.org> to assist in answering the following questions:

Click on the *Modern Technology* tab and then on *Mining Videos* from the drop down menu. Select the Low Resolution version of the *What is Coal* video:

28. In a very simple way, coal is a rock that _____.
29. The main types of fossil fuels are _____, _____, and _____.
30. A thick layer of dead plants form a spongy brown material called _____.
31. Peat hardens with heat and pressure to form _____.
32. The harder the coal the less _____ it contains and the _____ it burns.
33. The hardness of coal is a result of _____.
34. _____ % of Kentucky's coal has been mined over the last 170 years.

Click on the *Modern Technology* tab and then on *Mining Videos* from the drop down menu. Select the Low Resolution version of the "*Coal Preparation*" video:

35. The three fractions of coal include _____, _____, and _____.
36. The _____ step is where rock is removed from coal.
37. Since coal has a lower _____ than rock, the coal _____ while the rock _____.
38. To remove rock from the fine fraction, surface _____ is used.
39. The final step of coal processing is called _____.
40. A _____ is used to force the remaining water out.
41. Coal is America's most abundant _____ resource.