

iLab: Our Choice - Nonrenewable Resources
Chapter Two – Where Our Energy Comes from and Where It Goes
Chapter Seven – Carbon Capture and Sequestration
Chapter Eight – The Nuclear Option

iPad use: You are a brilliant student. You know how to do all sorts of crazy stuff on an iPad like change the wallpaper, check your twitter account and download Angry Birds. Please resist doing those things, because today we are doing a lab specifically with the app called “Our Choice.” When you get your iPad, please go directly to the app. Thank you for your cooperation.

When you open the app “Our Choice,” you will be greeted by Al Gore (who wrote the book this app is based on). If you are instead greeted by a spinning Earth, press the counter-clockwise arrow in the lower left corner. Touch anywhere on the screen (you can even poke Al in the eye!) and press “skip welcome.” This will take you to a tutorial which is very helpful. Upon completing the tutorial, touch the screen again to “skip titles”. This brings you to spinning Earth, where we will begin.

Advance to Chapter Two – Where Our Energy Comes from and Where It Goes, and expand the first page to full screen. As you read the chapter, answer the following questions.

Subheading: Understanding Our Sources of Energy

1. What is the single largest source of man-made global warming pollution?

Movie: The Big Issues of Coal

2. What are the big issues of coal?

Subheading: Liquid Fuels

3. Compare the CO₂ generated by oil versus coal.

Subheading: Natural Gas

4. What is the primary natural gas used?
5. What percentage of CO₂ produced in the energy marketplace comes from the burning of gas?

Subheading: Electricity

Movie: Turbines-The Way Most Electricity is Created Today

6. Explain how a turbine works.

Subheading: Renewable Sources of Energy

7. Describe your feelings about the series of pictures that show oil and gas fields.

Subheading: Making Renewable Energy Affordable

8. List three reasons why renewable energy sources will decrease in price over time.

Advance to Chapter Seven – Carbon Capture and Sequestration, and expand the first page to full screen. As you read the chapter, answer the following questions.

Subheading: Can We Capture Carbon?

9. Explain the T.S. Elliot quote as it relates to carbon capture and sequestration.

Movie: How CO₂ is Sequestered

10. What is a “supercritical state” and how does it assist the sequestration process?

Subheading: Skepticism and Concerns

Movie: Is Sequestration Safe?

11. Name the organization that Dave Bowen and Susan Capalbo work for. What types of organizations do you feel would participate in a sequestration partnership?

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Subheading: False Promises

Subheading: The Cost of Carbon

12. By what process do 99% of all coal-fired power plants in the United States use?

13. Describe the landscapes you observe in the series of four photographs.

Subheading: Safe Storage

14. What do you feel are the largest risks involved with carbon capture and sequestration?

Subheading: The Future of CCS

15. What has the Speipner Gas Field project demonstrated?

Advance to Chapter Eight – The Nuclear Option, and expand the first page to full screen. As you read the chapter, answer the following questions.

Subheading: Should We Go Nuclear?

16. What was the conclusion of the M.I.T. study?

Movie: How a Nuclear Reactor Works?

17. Describe the chain reaction taking place in a nuclear reactor.

18. How does this chain reaction lead to the formation of electricity?

Subheading: Nuclear Power Around the World

19. Name the three countries that operate the most number of nuclear power plants.

Subheading: Splitting the Atom

Subheading: Safety Concerns and Other Obstacles

Movie: The Three Mile Island Disaster

20. Name the radioactive gas released by Three Mile Island.

Subheading: High Costs and Bottlenecks

Subheading: Problems of Scale

Subheading: The Nuclear Weapons Issue

21. Based on the previous several subheadings, briefly describe the major obstacles to increased use of nuclear power worldwide.

Subheading: Next-Generation Nuclear

Graphic: Nuclear Pebble Bed Reactor

Movie: Pebble Bed Reactor

22. How does “pebble bed” reactor waste differ from conventional nuclear reactors?

Subheading: New Reactors

Subheading: Fuel & Reprocessing

Subheading: Storage

23. What is meant by a “not in my backyard” issue?

24. What is the half-life of nuclear waste products?

Graphic: Carbon Dioxide Footprints of Electricity Sources

25. Compare the CO₂ footprint of nuclear energy versus other energy sources.

26. Compare the source of CO₂ for renewable energy sources to the source of CO₂ for nonrenewable sources.

Subheading: The Nuclear Future

27. Do you feel the use of nuclear power will increase or decrease in the near future? Why?

Subheading: The Potential of Nuclear Fusion

28. How does nuclear fusion differ from nuclear fission?