

Explore Energy: Designing a web portal and curriculum for Texas middle school students

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Abstract

Our goal is to develop a website for use by Texas middle-school earth science teachers and students, providing them with a dynamic and cost-effective way to learn about energy and conservation.

Using information obtained in our literature review, we developed personas for two middle-school students and a teacher to anchor our website design, always keeping our target user population in mind. The website was designed to be easy for students to search and navigate, with engaging interactive media and activities, while also allowing teachers to quickly find the resources they need. After developing a functional digital prototype, we plan to implement our usability study to obtain feedback from Texas middle school students and teachers.

Profiles:

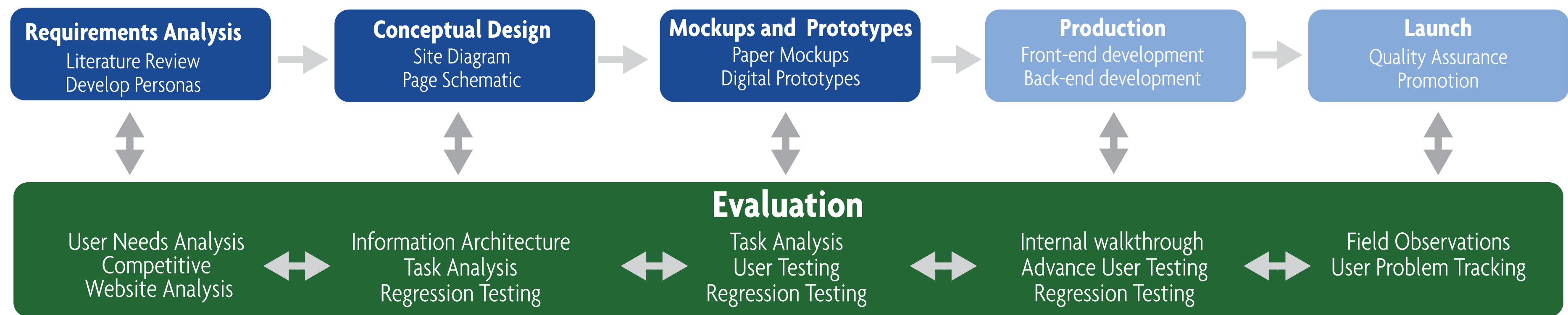
Profile: Texas 6th Grade Female Student
Name: Ellie Chen
Age: 11
Gender: Female
Location: Pasadena, TX
Education: Completed 5th grade
Family: Parents are married but father is on 2nd tour of duty in Afghanistan and her mother is a part-time substitute teacher, she is a single mother.

Profile: Texas 6th Grade Male Student
Name: Jesse Turner
Age: 11
Gender: Male
Location: Woodlands, Texas
Education: completed 5th grade
Family: Parents are married, 2 younger sisters (8 and 3)
Hobbies: Baseball, video games

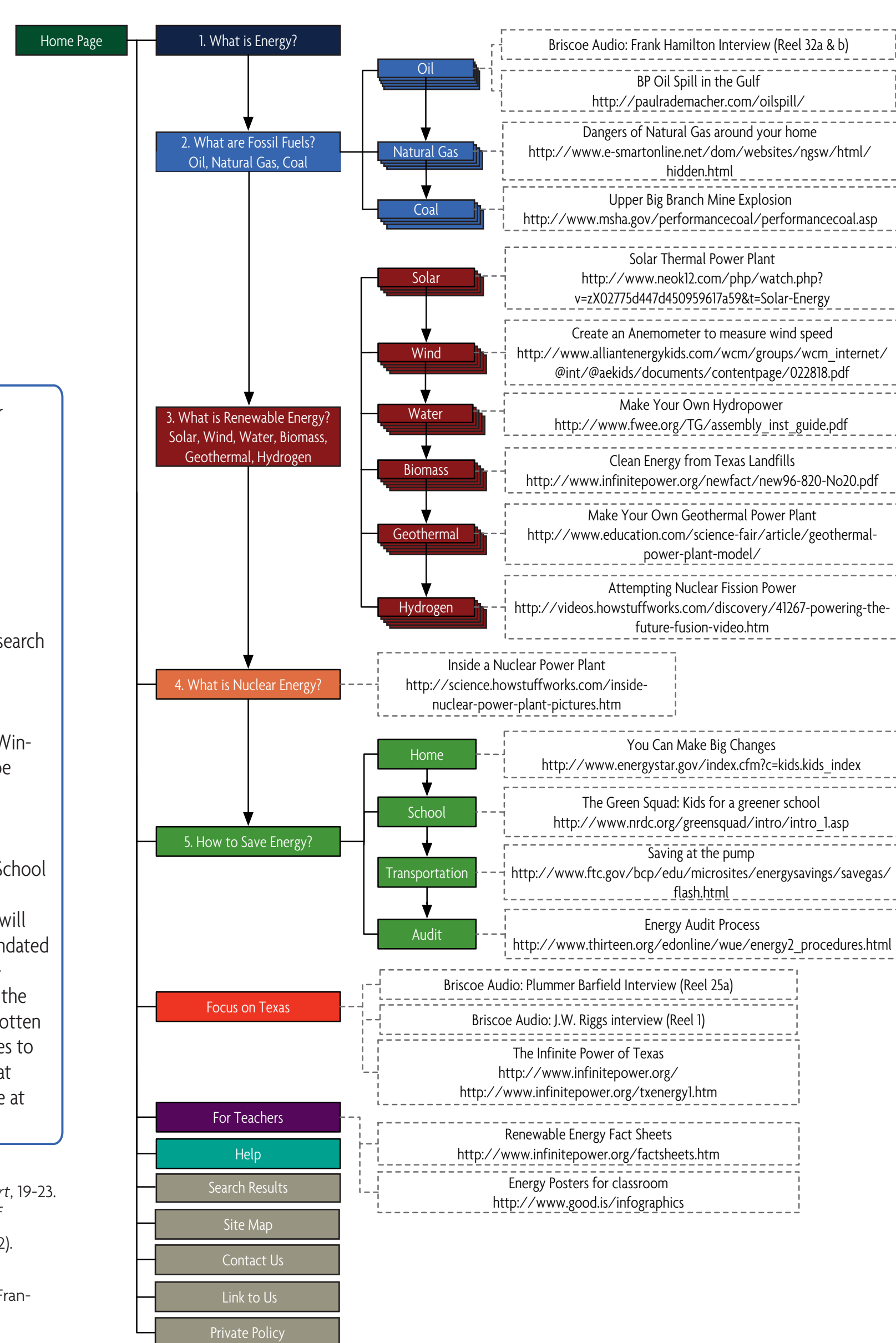
Profile: Texas 6th Grade Science Teacher
Name: Susan Anderson
Age: 48
Family Status: Divorced, two children
Location: Houston, TX
Education: Bachelor's degree in Education
Occupation: 6th and 7th grade science teacher
Annual household income: \$55,000
Web Experience: Moderate
Primary Potential Use of Internet: Email, banking, research for school lessons
Favorite Web sites: Yahoo email, <http://kids.earth.nasa.gov/>
Technical Setup: School PC, 15.6" LCD (1280x1024), IE, Windows 7, JavaScript and Cookies enabled, Flash and Adobe Acrobat installed.

Profile: Mrs. Anderson has been employed at Houston Middle School as a science teacher for 21 years. She is an experienced teacher, who has little time to waste on materials that will not keep her students engaged as well as cover the mandated curriculum. She has mostly stuck to textbooks and self-developed class projects, though she occasionally uses the Internet for inspiration and research. She recently has gotten more excited about the potential use of Internet sources to help teach her students, but does not have much time at school to look for sources, and spends most of her time at home grading assignments and with her family.

Process and Methods



Site Architecture:



Mockups:

When clicked, "What are Fossil Fuels" will expand to display:

What are Fossil Fuels?

Most of the substances we use today as energy come from plants and animals that lived hundreds of millions of years ago. Mud, rocks and sand came to bury the dead organisms, and over time, heat and pressure changed their remains into other substances, such as oil, natural gas and coal.

- Oil - is a thick, black liquid that is pumped from deep within the earth.
- Natural Gas - is a mix of methane and other gases, often found on top of oil deposits.
- Coal - is a solid black energy source that must be dug out of rocks. [Let's get started!](#)

Our Plan for Usability Testing:

- Participants**
- Middle school students recruited from after-school science club
 - Small sample size due to constraints of working with children
- Task Sessions**
- One on one researcher/student sessions
 - 2-3 minute exploration of site without instruction
 - 20 minutes to complete tasks
 - 10 minute semi-structured interview
- Sample Tasks**
- Find a map of the extent of the recent oil spill in the Gulf of Mexico.
 - Find three examples of ways to save energy.
 - Find an eye-witness account of the discovery of oil at Spindletop.
- Sample Questions**
- What did you like best about the website?
 - Was there anything you noticed that you didn't like about the website?
 - What do you think would make the website better?
 - On a scale from 1-5, where 1 is the easiest and 5 is the hardest, how easy or hard was it to complete the tasks using the website?
- Data Collection**
- Video recordings of task sessions and semi-structured interviews
 - Data logs from task sessions

Our website's usability will be graded on the children's ability to complete the tasks, and their perception of the interface—is it fun? boring? easy? Feedback will be incorporated in to our design process.

Binkowski, M. (1998). Recommending Web resources to science educators. *AAAI Technical Report*, 19-23. Retrieved from: <https://www.aaai.org/Papers/Workshops/1998/WS-98-08/WS98-08-004.pdf>

Naidu, S. (2005). Evaluating the Usability of Educational Websites for Children. *Usability News* 7(2). Retrieved from http://www.surl.org/usabilitynews/72/children_internet.asp

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