UTAH OFFICE OF
ENERGY DEVELOPMENT

Powering Your Future with an Energy Career

Grade/Subject: Earth & Space Science

Strand/Standard ESS.4.2 Use computational thinking to explain the relationships between the sustainability of natural resources and biodiversity within Earth systems. Emphasize the importance of responsible stewardship of Earth's resources. Examples of factors related to sustainability could include costs of resource extraction, per-capita consumption, waste management, agricultural efficiency, or levels of conservation. Examples of natural resources could include minerals, water, or energy resources. (ESS3.A)

Lesson Performance Expectations: Students will learn about various careers related to energy. Students will learn about specific energy careers based on their interests.

Materials: Students need a computer/Ipad, etc.

Time: 1 entire class period. Then 5-10 minutes for presentations for 2-3 class periods.

Teacher Background Information:

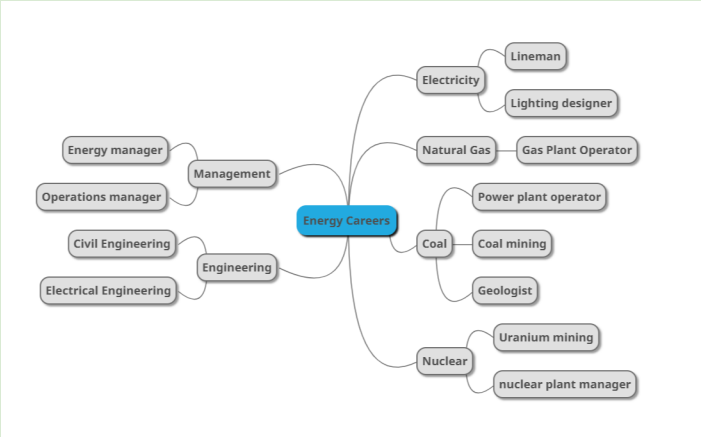
- https://connectedstudios.org/url-zuF2ha7ENUkhXWnhzOFCGrTnKFIAxYaCUodeL00N
- Scholarship CTE Winner Video (1:43 min)
- http://www.khake.com/page49.html
- A skilled labor force is needed to meet our increasing energy needs to maintain the high quality of life that is made possible by energy. Along with a variety of jobs, there are opportunities to work in exciting places in Utah. Because energy is also a global commodity, many local jobs have a global reach.
- The energy industry is a growing job market with good pay and job security, and there's a high demand for a skilled energy workforce. The energy industry has many different careers to consider; some require advanced degrees, some require a high school diploma. The field of energy calls for a diverse breadth of skills, including; science, math, engineering, communications, public relations, policy, business, and management.

- Energy Jobs can be broken down into several categories:
    - Project Development Specialists: energy analysts, geologists, geophysicists, hydrologists, LEED-certified architects, business specialists, environmental scientists, ecologists, and researchers.
    - Project Management Specialists: certified energy managers and sustainability coordinators, line workers, blasters, natural gas technicians, Computer programmers and operators, accountants, marketing specialists, human resources officers.
    - Project Initiation Specialists: surveyors, designers, carpenters, plumbers, electricians, pipefitters, welders, and mechanics
    - Energy Extraction: mining, drilling, structural, petroleum, and geothermal engineers, photovoltaic installers, wind turbine technicians, welders, riggers, and mechanics design
    - Energy Production: electrical, structural, electricians, mechanical or geothermal operation engineers, wind turbine technicians, hydroelectric plant operators, scrubber managers, electrical machinists, electricians, and nuclear reactor technicians
- Energy Distribution: electrical, structural, or mechanical engineers, construction workers

Student Background Knowledge:
Students should understand that energy development, distribution, and use are critical to our society.

Teacher Step by Step: A 3-d lesson should insist students think. Provide time and space for the students to experience the phenomenon and ask questions. The student sheet provided below provides guidance but is only an example of how students might respond.

1. **Introduce *Phenomenon: Show this video showcasing a variety of jobs related to energy.***
   https://www.youtube.com/watch?v=yFPZRvvH6GY *4 Minutes*
2. *Have students write down the benefits of working in the energy industry as they watch the video(s)*
3. Identify which of those benefits seem most important in a career for them.
4. Brainstorm as many careers as you can in the energy industry.
5. As a class, build a mind map/web on paper/whiteboard or an electronic platform like a mindmap. Start the center of the web with 'Energy Careers' See the example below.

6. 

7. Have each student pick one career from the map. Encourage them to pick a career that interests them or fits with the benefits they identified after watching the video.
8. Have each student find a 2-5 minute 'day in the life video' highlighting an individual's experience in the field of energy. If they cannot find their exact career, have them pick a similar career, or they can look for a career that the class didn't think of on the mind map.
9. Have students research the education/training needed for the career and the average income and job prospects for the career.
10. Have students give a quick intro to their career to the class and then show the day in the life video. You can spend a couple of class periods doing all presentations or do 1-3 each day until all students have presented.
11. If you cannot spare the time, have students present in small groups or pick a few to share with the whole class.

Assessment of Student Learning. Student summary should include a claim, evidence, and reasoning. An example claim could be that Energy careers are meaningful or well paid. Evidence could be a variety of connections to everyday life and salaries. An example of reasoning might be why the student thinks the work is important or wants to make a good salary.

Standardized Test Preparation:

Powering Your Future with an Energy Career

By: CareerCast.com

Through the nation's economic peaks and valleys, one constant is our need for energy. And fulfilling that need is a booming business. Energy is "a universal commodity," Lippert Glenn explains. The energy industry is a universal employer, with career opportunities covering a very diverse spectrum.

There are many obvious job options in energy, ranging from petroleum engineers, derrick operators, and oil rig workers in the oil and gas sector to geoscientists at the major energy companies. But there are many more career paths that cover a broad spectrum of functional skills and abilities.

According to Lippert Glenn, job seekers with experience, education, and competencies not typically associated with the energy industry can still find abundant opportunities in the sector, says Lippert Glenn. "One year I'll hear that marketing is the most needed position, then the next year it's: 'oh no, we need IT.' Then the next year, it's legal," she says. "It's cyclical."

In other words, having previous energy industry experience isn't necessarily required to land a job with an energy company. "I look for strong [core] discipline skills," Lippert Glenn says. "We can teach energy."

In addition to needing candidates with a wide variety of skills, energy companies often seek those interested in traveling the globe. Lippert Glenn frequently travels between her company's locations in Princeton, N.J., Oxford, England, and Singapore.

Lippert Glenn says that the energy sector's global reach offers both its most attractive aspect and its greatest challenge. Industrialization in fledgling economies has growing the demand for electricity, propane, gasoline, and other energy sources exponentially. China and India are the world's two most populous nations, and their energy demand is swelling. But Lippert Glenn says African nations will be essential epicenters in the coming years of energy production, and many new jobs will be created as a result.

Another significant factor is the growth of renewable energy sources, which are increasingly important to the industry. New jobs, such as wind turbine service technician and solar photovoltaic installer, offer growing opportunities.

1. What kinds of jobs are available in the energy industry?
    a. A large variety*
    b. Oil drilling
    c. Coal mining
    d. Gas-line construction

2. What can be expected from an energy-related career? Choose all that apply.
    a. Moderate to good salaries*
    b. Interesting work*
    c. Travel*
    d. Meaningful work*

3. What training is necessary to work in the energy industry?
    a. Engineering degree
    b. Law degree
    c. Associates degree
    d. Strong core discipline skills*
    e.
4. Why is the energy field expanding and needing new employees?
    a. New energy solutions are needed.*
    b. Countries outside the US are developing energy resources.*
    c. Alternative energy sources are reducing the need for energy.
    d. Nuclear power plants are requiring many new employees.

Extension of lesson: Have students brainstorm ways to prepare for a career in the energy sector (i.e.)stem classes, extracurricular activities, etc.

Powering your Future with an Energy Career

Name_____

1. Phenomenon: Watch the video. What are some benefits to working in the energy industry?

A.

B.

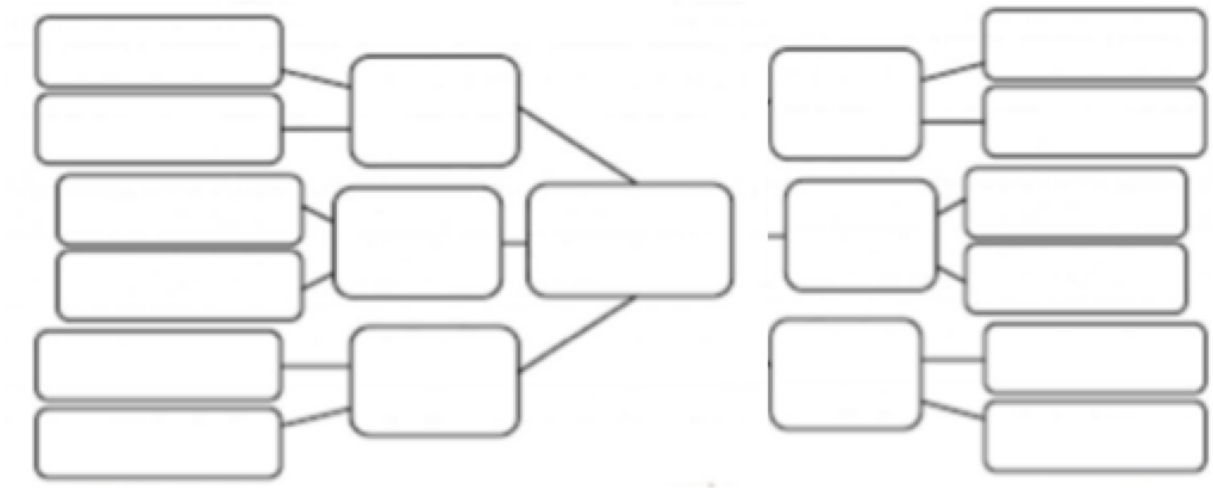
C.

D.

2. Which benefit would be most important to you?

3. List 5 careers that are related to energy development:

4. Create a graphic organizer to summarize the careers available in the energy industry.



Energy Careers in the Center

4. Which energy career have you chosen to study further._____

a. Find a 2-5 minute video that shows what a day in the life of this career would look like. What do they do during the day?

b. What is the average salary for this career?

c. What kind of education or training is required for this job?

Student Presentation Rubric- Students fill this out as others present:

Score (1 is lowest, 5 is highest)

Name of Career	What do they do?	How interesting is the career? (1-5)	Quality of presentation (1-5)	Would you want to do this job?

Summary:

Claims energy occupations in general.

What **evidence** was convincing to you?

What is your **reasoning**?