GOVERNOR'S OFFICE OF ENERGY DEVELOPMENT

Advancing Utah's Energy Future

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/chromebook/Ipad, etc.

Time: 1 class period + 5-10 minutes each class for presentations for 2-3 class periods

Teacher Background Information:

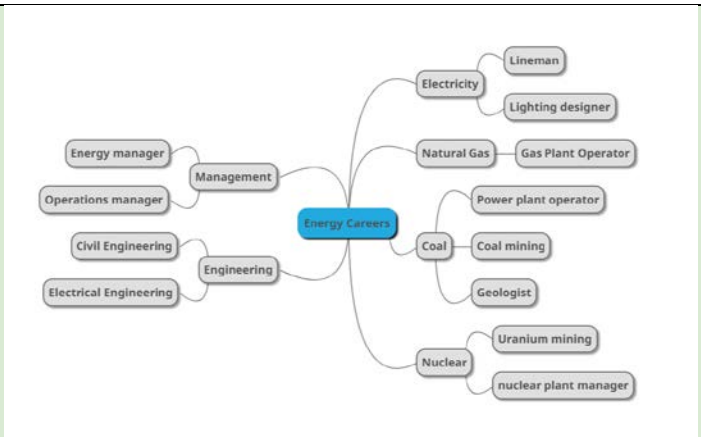
- https://connectedstudios.org/url-zuF2ha7ENUkhXWnhzOFCGrTnKFIAxYaCUodeL00N
- Scholarship CTE Winner Video (1:43 min)
- http://www.khake.com/page49.html
- A skilled labor force is needed to meet our increasing energy needs to maintain the high quality of life that is made possible by energy. Along with a variety of jobs, there are opportunities to work in interesting 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 is critical to our society.

Teacher Step by Step: A 3-d lesson should insist students do the thinking. 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. *As students watch the video(s) have them write down as many of the benefits of working in the energy industry that they can.*
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 on an electronic platform like mindmup. Start the center of the web with 'Energy Careers' See example below.



6.
7. Have each student pick one career from the map. Encourage them to pick a career that interests them or they think 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 as well as 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 (Energy careers are interesting and important (or dull) well paid (or not very), evidence is a variety of work experiences (or repetitive work), reasoning might be that the student likes to work with their hands, numbers or make a good salary (or does not like to work with hands, math or salary is not important to them).

You may collect rubrics for additional assessment on the presentation itself.

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. As such, 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 which cover a wide spectrum of functional skills and abilities.

In fact, 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 who are interested in traveling the globe. Lippert Glenn travels frequently between her company's locations in Princeton, N.J., Oxford, England and Singapore, for example.

The energy sector's global reach offers both its most attractive aspect and its greatest challenge, Lippert Glenn says. Industrialization in fledgling economies has grown 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 important 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 of increasing importance to the industry. New types of jobs, such as wind turbine service technician and solar photovoltaic installer, offer growing opportunities. https://energy.careercast.com/article/best-jobs-energy

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 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*

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 and Career Connections:

Extension: Have students brainstorm ways that they can prepare for a career in the energy sector. Encourage 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.

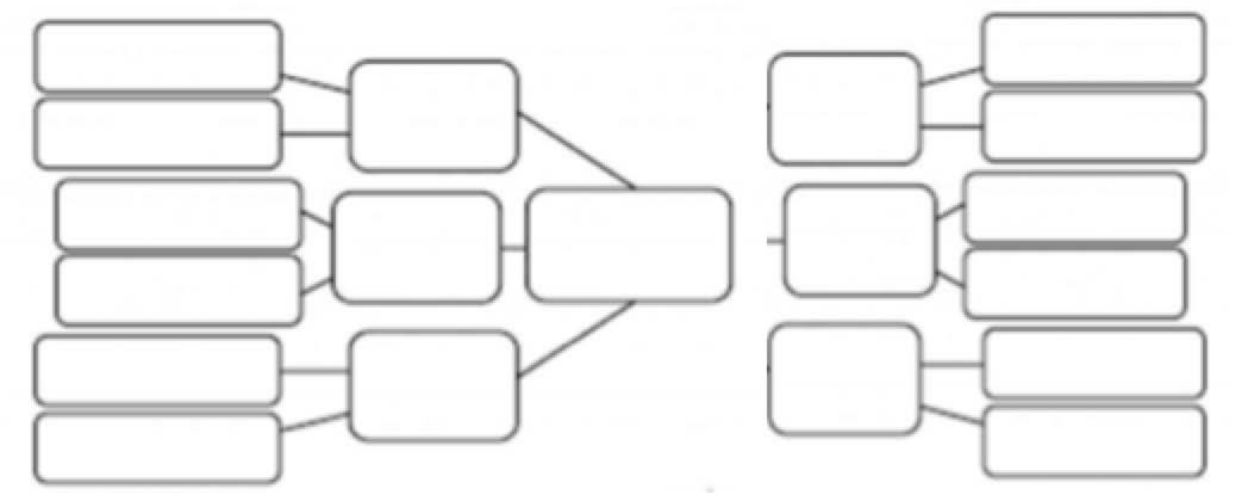
C.

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 a 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:

Make a **claim** about energy occupations in general.

What **evidence** was convincing to you?

What is your **reasoning**?