



**GOVERNOR'S OFFICE OF  
ENERGY DEVELOPMENT**

*Advancing Utah's Energy Future*

# Utah's Energy & Minerals Education Initiative

Western States Coal Strategies Forum

November 20-22, 2019

**Utah Governor's Office of Energy Development**

Kevin Brooks – Senior Energy & Education Program Specialist



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The Governor's Office of Energy Development is dedicated to advancing all forms of responsible energy and minerals for the provision affordable, reliable and sustainable energy through planning, policy and direct engagement.

-Gov. Gary R. Herbert



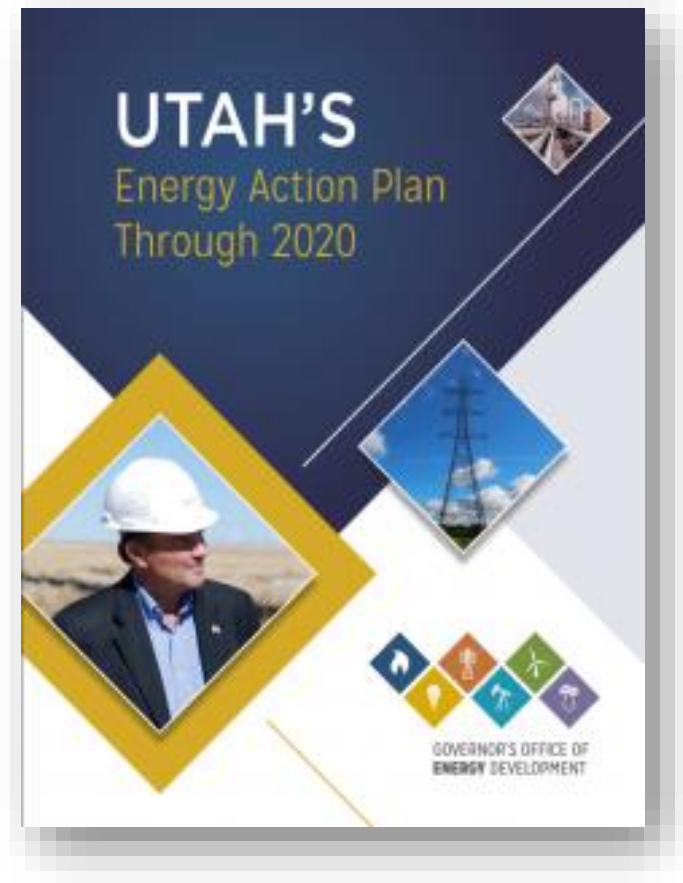
# Utah's Energy Action Plan



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- Support Energy Research, Demonstration and Development Initiatives
- Continue to Organize Energy and Minerals Events
- Increase All-of-the-Above Energy Communications
- Expand Education Initiatives





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# Summary: Advancing Utah's Energy and Minerals Economy

## Policy & Planning



- Inform and advance state and federal policy to promote development and drive innovation

## Industry Assistance



- Funding & Incentives
- Public/Private-Sector direct engagement
- Trade Missions

## Education & Outreach



- K-12 Education
- University Energy Research Triangle
- Summits, Symposia, Workshops, Forums

# Utah Energy and Minerals Education Initiative

Website

<https://energy.utah.gov/k-12-education/>



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MENU



## K-12 EDUCATION

*A skilled labor force is key to powering Utah's bright  
future*

Looking for:  
SOLAR PV TAX CREDIT

[CLICK HERE](#)



# Utah Energy and Minerals Education Initiative

## Curriculum & Lesson Plans



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### Coal Distribution in Utah

Students will compare geological and coal maps of Utah to determine why coal is unevenly distributed across the state.

Grades 8

### The Many Uses of Petroleum

Students will obtain information about the difference between natural and synthetic material and compare it to the process of refining oil.

Grades 8

### Chemistry of Combustion

Students will be able to explain the concept of combustion-burning of materials.

Grades 8

### Mining and Reclamation

Students will conduct a mining activity with chocolate chip cookies, then design a solution to improve their profits and environmental impacts.

### Using Natural Resources In Utah

Students will look at maps of energy sources in Utah and compare it to the geography and population centers in Utah to explain where new sites should be proposed.

### Hands-On Permeation

Students will obtain information about oil extraction in Utah by performing investigations about porosity and hydraulic fracturing.

## To Date

- 30+ Lesson plans
- Covering grades 3-12
- Set to Utah State Standards
- Featuring STEM based activities
- Free to download


# Utah Energy and Minerals Education Initiative

## Lesson Plans – A Closer Look



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### Coal Distribution in Utah

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**Grade/Subject:** 8th Science

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**Strand/Standard 8.4.1** Construct a scientific explanation based on evidence that shows that the uneven distribution of Earth's mineral, energy, and groundwater resources is caused by geological processes. Examples of uneven distribution of resources could include Utah's unique geologic history that led to the formation and irregular distribution of natural resources like copper, gold, natural gas, oil shale, silver, and uranium. (ESS3.A)

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**Lesson Performance Expectations:** Students will compare geological maps of Utah to coal maps of Utah to determine why coal is unevenly distributed across the state.

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**Materials:**

**Per student:**

- Student Sheet
- Access to [Geological and Resource Map](#) this could be accessed digitally or printed for each student.

**Material for Layering Model:** This model can be done as a demonstration or in small groups.

- 1 bag of dark sand
- 1 bag of light sand
- 1 bag of soil
- 1 bag of small gravel
- Green leaves
- Spray bottle(s) with water (one per class or each small group)
- Shallow aluminum pan to put it in. The bottom needs to be flexible to enable uplifting.
- Spoon(s)
- Ruler(s)

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**Time:** 1 period, 60 minutes

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**Teacher Background Information:**

Coal was formed from the dead remains of trees, ferns, and other plants that lived millions of years ago in swampy areas. Geological processes such as uplift have unevenly distributed coal even further.

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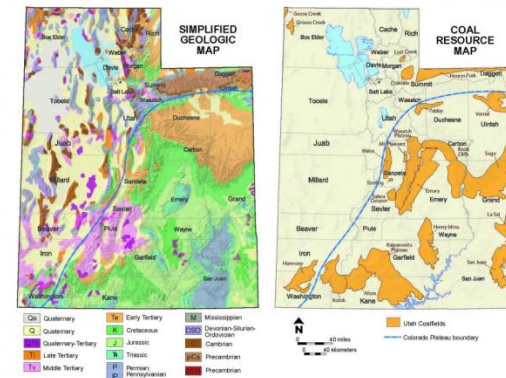
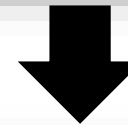
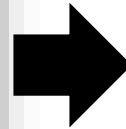
**Student Background Knowledge:**

- Students will understand what a fossil fuel is and that coal is a type of fossil fuel.
- Students will understand uplift.
- Students will understand that geological forces have shaped Utah's landscape.

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

1. **Introduce Phenomenon:**
  - a. Show students the following image and have students imagine they were hiking one day and saw this scene. Have them make a list of questions based on what they see in the picture.



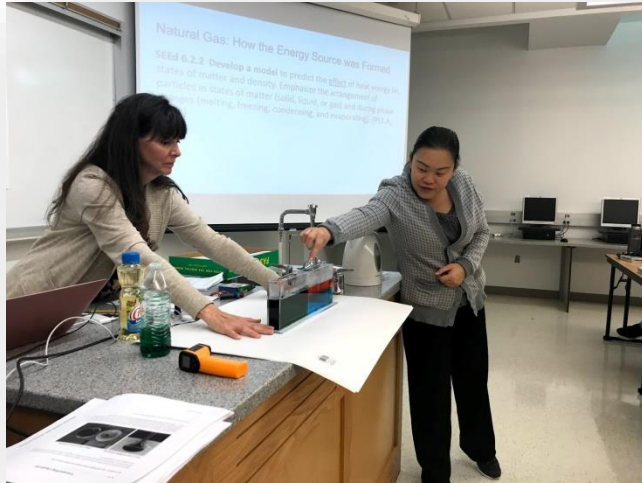
# Utah Energy and Minerals Education Initiative

## Professional Development Workshops



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- Teacher relicensure points provided
- Substitute stipend provided
- Lesson kit provided for future use
- 50+ educators trained





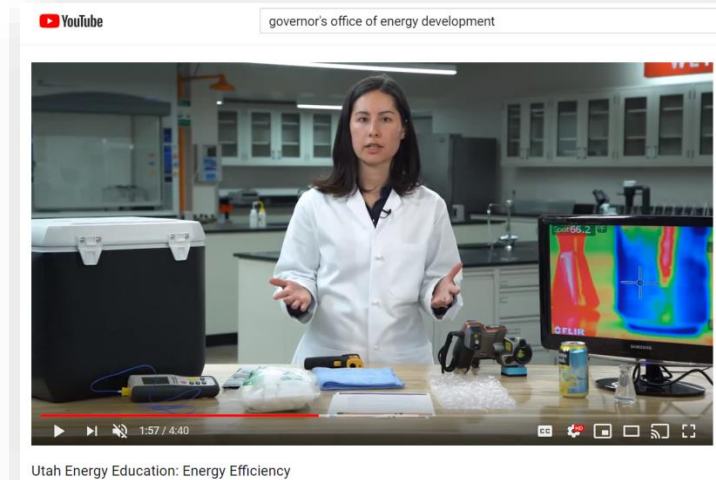
# Utah Energy and Minerals Education Initiative

## Energy and Mineral Videos



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- 40+ YouTube Videos
- Featuring hands-on energy and minerals education activity videos
- Directly tied to their specific lesson plan
- Designed with the teacher in mind



Utah Energy Education: Energy Efficiency



Utah Energy Education: Natural Gas and Density



Utah Energy Education: Core Drilling with Play-doh

# Utah Energy and Minerals Education Initiative

## Workforce Development



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### Utah Energy Workforce SCHOLARSHIP

The Governor's Office of Energy Development is proud to partner with Chevron to advance Utah's energy workforce by providing scholarships to high school seniors who intend to pursue a Science, Technology, Engineering, or Math (STEM) related course of study at a public or private institution of high learning in Utah.

5

Five \$4,000 scholarships for students attending a Utah college or university

5

Five scholarships for up to \$2,000 for students attending a Utah technical college

#### Submit Your Application Today!

- ◆ Complete the energy questionnaire
- ◆ Write an essay about your STEM goals
- ◆ Submit your application to kevinbrooks@utah.gov

Deadline: April 1, 2020

For more information visit [energy.utah.gov/k-12-education/scholarship/](http://energy.utah.gov/k-12-education/scholarship/)



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human energy



## Utah Power & Energy Career Expo

Sponsored by:



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ENERGY DEVELOPMENT  
Advancing Utah's Energy Future



Come explore career and Internship opportunities in the Power & Energy Industry!

Friday, February 13, 2020

10:00 AM - 4:00 PM

University Of Utah Student Union

RSVP in **ii**handshake

[https://utah.joinhandshake.com/career\\_fairs/8923/student\\_preview](https://utah.joinhandshake.com/career_fairs/8923/student_preview)

**U** ENGINEERING **U** CAREER & PROFESSIONAL DEVELOPMENT CENTER  
THE UNIVERSITY OF UTAH

# Utah Energy and Minerals Education Initiative

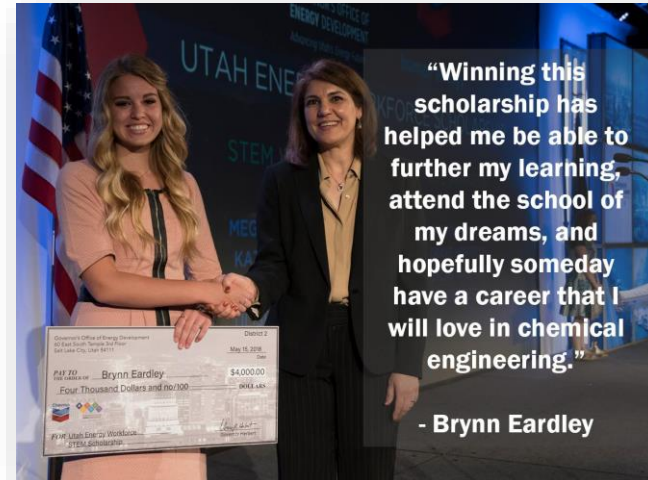
Conferences, events, and more



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- Governor's Energy Summit
- Utah Power and Energy Career Expo
- The Energy and Minerals Pavilion at STEM Fest
- Utah Science Teachers Association Conference
- Greenpower Electric Car Challenge





# Utah Energy and Minerals Education Initiative

## Continued Partnerships & Conclusions



- Building partnerships
- Increasing public awareness
- Making connection between our lives and the resources we need
- Growing our curriculum
- Integrating the education website with media and partners
- Supporting workforce development through event participation
- Driving Utah's rising generation to supporting our energy and minerals future





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# Thank you!

**Kevin Brooks**

**[kevinbrooks@utah.gov](mailto:kevinbrooks@utah.gov)**

**801-538-8725**

