



## TASK OVERVIEW

# HIGH SCHOOL EARTH AND SPACE SCIENCE: BRICEVILLE

### Three-Dimensional Claim

Students will apply an understanding of **how the availability of natural resources affects communities and individuals** by **comparing, integrating, and evaluating sources of information in order to communicate** **how factors associated with coal mining in the Briceville, Tennessee community have impacted individuals and the community over time.**

■ Disciplinary Core Ideas ■ Crosscutting Concepts ■ Science and Engineering Practices

### Tennessee Academic Standards for Science

This task is intended to elicit student learning of the following Tennessee Science Standard:

**TN HS ESS.ESS3.2:** Obtain, evaluate, and communicate information on how natural resource availability, natural hazard occurrences, and climatic changes impact individuals and society.

*Note:* The task asks students to consider how the natural resource availability of coal affected the population and economy of a community in Tennessee. The task is limited to the economic impact on individuals and society.

### Next Generation Science Standards

This task is intended to elicit student learning of the following NGSS elements for each of the three dimensions:

#### Science and Engineering Practices

##### Obtaining, Evaluation, and Communicating Information

- *High School Element:* Compare, integrate, and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

#### Crosscutting Concepts

##### Cause and Effect: Mechanism and Prediction

- *Middle School Element:* Phenomena may have more than one cause, and some cause-and-effect relationships in systems can only be described using probability.

#### Disciplinary Core Ideas

##### ESS3.A. Natural Resources

- *High School Element:* All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.



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	STRENGTHS	OPPORTUNITIES FOR IMPROVEMENT
<b>SCENARIO</b>	The task requires students to make sense of different patterns and factors to explain a local, real-world phenomenon of why the town of Briceville has changed so much in the last 100 years.	It may be difficult for students to infer that there has been a significant economic impact to Briceville solely based on information in the task introduction as expected.
<b>SENSE-MAKING</b>	Students make their thinking visible through scaffolded prompts that help them make sense of the information before synthesizing it.	Students may be able to respond to the prompts in a superficial manner and they might not need to use sense-making unless they have had experience thinking about cascading economic impacts prior to the task.
<b>INTEGRATED DIMENSIONS</b>	The majority of the task requires students to use at least two dimensions to successfully answer. Students are given a variety of different information throughout the prompts to integrate for their final explanation.	Only pieces of the claimed SEP, DCI, and CCC elements are being elicited by students in the task. The cross-cutting concept is being elicited implicitly and could be made more explicit.
<b>EQUITY</b>	The language is accessible, and the task offers students multiple ways to share their thinking. The task outlines what students will be doing in the beginning so that the prompt sequence makes sense and is coherent to students.	Prompt B could be modified so students are given information that strongly leads them to choose a negative impact. Based on the given information (the trends of coal production in Graph 1), students could come to either conclusion, but the teacher's guide only identifies a negative impact as the correct answer.
<b>FEEDBACK SUPPORT</b>	The teacher guide has well designed and clear scoring guidance that is connected to the three-dimensional target.	The artifacts produced by the task provide observable evidence that students can use pieces of each of the targeted three dimensions' elements. Users should be aware that, as written, students are not showing an understanding of any of the full claimed elements.





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### Suggestions for Use

This task partially elicits evidence of student learning of the targeted disciplinary core ideas, science and engineering practices, and crosscutting concepts. Therefore, the task could be used as formative assessment to see how students are progressing in their understanding of the claimed elements. Students would need other opportunities to demonstrate an understanding of the full claimed elements for all three dimensions throughout instruction. If using this task as a summative assessment, it should be clear what pieces of the elements are being assessed so that users can figure out where they want to supplement with other types of assessment as needed.

### What Are The Major Takeaways?

 SUMMARY POINTS	 SUGGESTIONS FOR IMPROVEMENT
<p>This task is strong, coherent, and has a compelling framing. Students are presented with real world, relevant information in a variety of ways and are supported to make sense of that information by engaging in multiple dimensions. Prior to engaging with this task, students will need opportunities to learn cascading economic impacts in different situations because most prompts require students to make a connection between a change that Briceville experienced and the downstream economic impacts.</p>	<p>This task could be improved by describing in the teacher guide the model of how economic effects are interconnected and cascading. This could become an individual model or class model developed during instruction, as students will need this information to engage deeply with the task. For example, it could show how changes in natural resources might lead to changes in job availability, which could lead to changes in population, need for goods and services, housing, or entertainment.</p>

### What Should I Do Before Using This Task?

Users should review the [provided guidance](#) to familiarize themselves with instructions and disclosures before using these tasks.

### How Were These Tasks Developed?

The tasks were developed and revised by teacher work groups from participating districts in the Tennessee District Science Network (TDSiN), which was launched in early 2019 and managed by NextGenScience. Tasks were evaluated using an adapted version of the Science Task Screener. Teachers worked collaboratively across districts to develop and revise these tasks after attending multiple professional learning sessions. Find out more about the development process [here](#).



NextGenScience, a project at WestEd, works alongside educators to design quality, coherent programs that align science standards, instructional materials, professional learning, and assessments.  
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