Debate in the Classroom

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Adding Debate to Your Science (or any) Classroom

Science and Engineering Practice: Asking Questions and Defining Problems
Students at any grade level should be able to ask questions of each other about the texts they read, the features of the phenomena they observe, and the conclusions they draw from their models or scientific investigations. For engineering, they should ask questions to define the problem to be solved and to elicit ideas that lead to the constraints and specifications for its solution. (NRC Framework 2012, p. 56)
Scaffolding the Lesson

Mining for Natural Resources

**Background:** Today, we are going to do an activity which simulates mining for natural resources. Our natural resource is going to be plastic shapes! Your team will be assigned a color shape. You will then take turns at mining your team's color from the mine.

There are TWO RULES: 1) No stealing of other teams' shapes 2) No destroying of other teams' shapes

As we mine, you will enter your results on the mining chart on the next page. When you have finished mining, you will complete the graph on the following page. Then complete the discussion questions.

Directions:

*Complete lesson [here](#)*
Solar Homes

Solar Home unit [here](#)
Biomass and Renewable Energy Sources

Transforming Biomass into Feedstock

- Combustion
- Biochemical
- Thermochemical (Pyrolysis)
- Thermochemical (Gasification)
- Waste-to-Energy
- Future Commodity

- Switchgrass: Ground, ¼ in
- Corn Stover: Ground, 2 in
- Torrefied Pine: Ground, 2 mm
- Eucalyptus: Pelleted, ¼ in
- Refuse-Derived Fuel: Ground, ¼ in
- Blend: Pelleted, ¼ in
Beginning the Debate: What is a Constructive Argument – and What’s Just Mean?

Lloyd Bentsen and Dan Quayle VP debate, 1988

Mike Bllomberg and Elizabeth Warren debate, 2020
Hopewell Township PENNEAST PIPELINE Town Hall Meeting

Topic: PennEast wants to build a 115-mile natural gas line from Luzerne County, Pennsylvania to Mercer County, New Jersey. Part of it will go through Hopewell Township, NJ.

Need: The town council wants to hear from the town residents and businesses to help them decide whether or not to allow the Pipeline to be built in the Township.

Your job, as a business owner or resident, is state your position (yes or no) and evidence to support that position from 3 areas:

1. Socioeconomic
2. Environmental (land, air, water)
3. Safety

Rubric: The township decision will be based on the quality of your argument based on (scores of 1, 2, and 3 awarded in each category):

1. Use of Evidence
2. Source and Quality of Evidence
3. Science Content Understanding
4. Adherence to the Presentation Protocol

Representation: Circle group you have been assigned to represent:

Business Owners FOR  Business Owners AGAINST
Residents FOR        Residents AGAINST

Your Resources:
1. Project Map
2. Hopewell Township Map
3. PennEast Pipeline Statement
5. Town Demographics
6. Hopewell Township Citizens Against the Pipeline

HOPEWELL TOWNSHIP FACT SHEET

Population: 17,500 people
- 7,000 households
- 1,200 businesses

Size: 65 square miles

Developed space: 30 square miles
- Downtown Hopewell
- Downtown Pennington
- Titusville
- Brandon Farms Development
- Route 31 business district

Open space: 35 square miles
- Delaware River
- Washington Crossing park
- Baldplate Mountain
- Sourland Mountain Range
- Storybrook Watershed

Heating Fuel Services:
- Elizabethtown Gas
  - 4,200 households (60%)
  - 960 businesses (80%)
- Bob's Oil Tank Refills
  - 2,100 households (30%)
  - 234 businesses (19.5%)
- Wood Chop Wood Delivery
  - 560 households (8%)
  - 0 businesses (0%)
- Alternative energy (solar and wind power)
  - 144 households (2%)
  - 6 businesses (0.5%)

Water:
- Individual well
  - 4,760 households (68%)
  - 120 businesses (10%)
- Public water
  - 2,240 households (32%)
  - 1,080 businesses (90%)
STOP PennEast Pipeline

ALERT: FERC Docket #CP15-558
Landowners and concerned citizens should register as intervenors to stay informed and protect their rights!

If you have said NO to survey access, report any trespassing issues. No Access = No Permits

Energizing Our Economy
Lowering energy costs and providing greater disposable income for families and businesses, as well as supporting thousands of jobs during construction.
Debate Teams

1. Residents for the pipeline (or any issue you choose)
2. Residents opposed
3. Business owners for
4. Business owners opposed

Students will have three specific topics to investigate for their presentation: socioeconomic, environmental, and safety. One student in each group will research and become expert on one of these topics.
I had them begin looking at the research materials and start taking notes. Students were allowed to use iPads to access our Google Classroom and most chose to take their notes on paper.
Remind the students to take notes, as well as information about the source. Part of their presentation must include specific references to where they read the information.

- Gas is bad for the environment and could kill lots of wildlife. #1
- The 115.1 miles of new 36 inch diameter pipeline extending from Luzerne county, Pennsylvania to Mercer county, New Jersey could hurt the environment.
- Penn East is trying its best to protect the waterlines. That could still mean they can harm the environment.
- All that gas could start climate change.
- The greatest risk is associated with fires or explosions caused by the ignition of the natural gas.
Students will be assigned to a team and they can choose their area of expertise: environmental, socioeconomics, or safety.

Once they begin researching and reading, they should organize their thoughts into a graphic organizer.
Claim: Do not build the pipe line.

Support:
According to [source] of [date]... “[direct quote].”

FIRC document page 3

Summarize what this means in your own words:
There will be more air pollution, more dust, a lot of noise, releasing of green house gasses, and bad air. Pipelines have not been known to be safe, and 8 people died because of a pipeline in San Bruno.

Why does it matter?
Some questions to consider:
• How many lives are impacted and how?
• Is wildlife impact? If so, how?
• What is the cost? Who is responsible for paying for the cost?

What I Say:
If penneast builds the pipeline, there will be more release of green house gasses, which is very bad, and there would be bad air, which would impact residents. Pipelines have not been known to be safe, and on September 9th, 8 people died and 60 people were injured. This may have the same outcome. Some safety issues are leaks from corrosion, there may be some valve damage or malfunction, and lack of use of remote control shut off valves.
The school’s debate coach prepared this sample organizational chart for the debate. A minute may not sound like a lot of time, but it’s roughly 100 words, which is enough.

<table>
<thead>
<tr>
<th>Speech</th>
<th>Time</th>
<th>Responsibility of Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Proposition</td>
<td>1 min</td>
<td>• Offer substantive socioeconomic arguments.</td>
</tr>
<tr>
<td>1st Opposition</td>
<td>1 min</td>
<td>• Rebut proposition’s socioeconomic arguments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer substantive socioeconomic arguments.</td>
</tr>
<tr>
<td>1st Proposition</td>
<td>1 min</td>
<td>• Rebut opposition’s socioeconomic arguments.</td>
</tr>
<tr>
<td>2nd Proposition</td>
<td>1 min</td>
<td>• Offer substantive environmental impact arguments.</td>
</tr>
<tr>
<td>2nd Opposition</td>
<td>1 min</td>
<td>• Rebut proposition’s environmental impact arguments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer substantive environmental impact arguments.</td>
</tr>
<tr>
<td>2nd Proposition</td>
<td>1 min</td>
<td>Rebut opposition’s environmental impact arguments.</td>
</tr>
<tr>
<td>3rd Proposition</td>
<td>1 min</td>
<td>Offer substantive safety arguments.</td>
</tr>
<tr>
<td>3rd Opposition</td>
<td>1 min</td>
<td>• Rebut proposition’s safety arguments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer substantive safety arguments.</td>
</tr>
<tr>
<td>3rd Proposition</td>
<td>1 min</td>
<td>• Rebut opposition’s substantive safety arguments.</td>
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<tr>
<td>Reply Collaboration</td>
<td>2 mins</td>
<td>• Think about the round.</td>
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<td>• Decide which arguments you are winning.</td>
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<td></td>
<td></td>
<td>• Select most important argument.</td>
</tr>
<tr>
<td>Opposition’s Plea (residents)</td>
<td>1 min</td>
<td>• Select one argument (socioeconomic, environmental or safety)</td>
</tr>
<tr>
<td>Business owners</td>
<td>1 min</td>
<td>• Explain why this is the most important argument</td>
</tr>
<tr>
<td>Proposition Reply (residents)</td>
<td>1 min</td>
<td>• Explain why this argument helps you win the debate.</td>
</tr>
<tr>
<td>Business owners</td>
<td>1 min</td>
<td>• Select one argument (socioeconomic, environmental or safety)</td>
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<td>• Explain why this argument helps you win the debate.</td>
</tr>
<tr>
<td><strong>PROPOSITION’S ARGUMENTS</strong></td>
<td><strong>OPPOSITION’S RESPONSES</strong></td>
<td><strong>TOPIC AREA</strong></td>
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<tr>
<td>Claim:</td>
<td>Rebuttal:</td>
<td>Socioeconomics</td>
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<td>Support:</td>
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<td>Safety</td>
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<td>Support:</td>
<td>Support:</td>
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Speech and Debate Topics

Topics on the Environment

Golden Rice

Golden Rice organization

Vitamin A deficiency

Nat Geo on GMO

What is a GMO?

Girls Talk trailer
Golden Rice

Resources
Local Topics?

NZ surgical priorities
Questions? Please contact me:

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