

Middle Level Science

Factories– Friends or Foes?

Objective: Students will be able to role play various points of view considering placement of a factory and its effects on air quality.

National Science Education Standards:

Standard E - Understandings about science and technology

Standard F - Personal health

Populations, resources, and environments

Natural hazards

Risks and benefits

Science and technology in society

Standard G - Science as a human endeavor

Benchmarks for Science Literacy: By the end of 8th grade, students should know that: The benefits of the earth's resources-such as fresh water, air, soil, and trees-can be reduced by using them wastefully or by deliberately or inadvertently destroying them. The atmosphere and the oceans have a limited capacity to absorb wastes and recycle materials naturally. Cleaning up polluted air, water, or soil or restoring depleted soil, forests, or fishing grounds can be very difficult and costly

Materials: Background information sheets, science notebooks

Teacher Notes: The students can research their roles by contacting real individuals, searching the Internet, or researching through written materials instead of giving them the role background information sheets. An appropriate amount of time must be added to the lesson to allow for research.

Engage:

1. Describe an open area near the school that the students see and or visit frequently. Inform them that a factory has decided to purchase the land and build in that spot.
2. Ask them whether they think it is a wise idea or not. Have them write in their science notebooks their opinions.

Explore:

3. Let the students know that they are going to role play as the people in the town that could be impacted by the factory. Divide them up into groups: city council (odd number), proposed factory owners; two or three each of: farmers, unemployed workers, lawyers, students, chamber of commerce, parents, teachers/administrators, business owners, and environmental group members.
4. Provide each group with their background information sheets. Allow time to read the information and prepare their presentation for the city council. You may need to provide resources, such as computer access, business magazines, or local contacts.

Set a date and time for the city council meeting a day or two in the future. Before the end of the period, the factory owners need to have a basic two-minute proposal concerning what they intend to build and what they will produce.

5. On the date of the city council meeting: Rearrange the room with the city council members behind a table in the front of the room. Have them call the meeting to order, list the order of presentations, starting with the factory owners. Have city council members follow their list – allowing each group 5 minutes to present (use a timer). After each presentation the city council members may ask that group questions, then allow the public to ask a limited number of questions. After all have presented, and questions have been answered, allow the city council to remove themselves for a limited amount of time to discuss and vote to allow or not allow the factory to be built. (Rebuttal time may be allowed, if factory owners need to clarify an issue.)
6. When they return, city council members need to present their decision and explain their reasoning.

Explain:

7. Have the students remove themselves from their roles and discuss what they learned. Why did you choose the point of view that you chose? Why would or wouldn't a factory really choose that site? How does this activity relate to air quality? Did anyone have to present an opinion that did not match their own opinions?
8. Have the students record in their science notebooks a summary of the activity and the results.

Extend:

9. Have the students research their roles, rather than supplying the background information.
10. Have various individuals from the community come in and observe the role-played city council meeting and have them present their actual point of view after the students' decision is made.
11. Have a local person from a similar background become part of a group and add their perspective to help the students present their assigned point of view.
12. Have the students vote whether they would actually be for or against the factory being built in the proposed area.
13. Check several websites to consider what a factory has to do to establish itself in a community. (Ex: <http://www.iowadnr.com/other/bizreg.html>).

Evaluate:

14. The teacher will observe participation of each individual. Science notebooks can be assessed for completeness of the summary and results.

Background Information Sheet

Farmers

Positives: They may like new business because it may provide less expensive materials, resources closer to the farm, and increased tax money being brought into the county.

Your ideas:

Negatives: Farmers need land to plant with agricultural crops or for animals to graze and this business may compete for that land. They do not want their land, water, or air polluted.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Unemployed Workers

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, a potential place to find a job, and increased money flow in their community.

Your ideas:

Negatives: They do not want their land, water, or air polluted.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Lawyers

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, potential customers, and increased money flow to themselves and in their community.

Your ideas:

Negatives: They do not want their land, water, or air polluted.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Students

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, a potential place to find a job, and increased money flow in their community. Parents may be able to find a job there. Their taxes will help support the schools, roads, and hospital in town.

Your ideas:

Negatives: They do not want their land, water, or air polluted. The noise may bother their studying. The factory may be a hazard as they walk to school and the traffic from the factory may be dangerous to the students.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Chamber of Commerce Members

Positives: They would like new business because it may provide less expensive materials, resources closer to their home, and increased money flow in their community. (Their job is to increase businesses in a community.)

Your ideas:

Negatives: They do not want their land, water, or air polluted.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Parents

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, a potential place to find a job, and increased money flow in their community. Their taxes will support the schools, roads, and hospitals in the town.

Your ideas:

Negatives: They do not want their land, water, or air polluted. They may not like the factory close to their children's school.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Teachers/Administrators

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, increased enrollment, and increased money flow in their community. Their taxes will help support the schools.

Your ideas:

Negatives: They do not want their land, water, or air polluted. The factory may be noisy and distract from lessons, as well as cause a safety issue for the students with extra traffic.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Business Owners

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, and increased money flow in their community.

Your ideas:

Negatives: They do not want their land, water, or air polluted. The company may compete for business with theirs. The factory may take employees from them.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Environmental Group Members

Positives: They may like new business because it may provide less expensive materials, resources closer to their home, and increased money flow in their community.

Your ideas:

Negatives: They do not want their land, water, or air polluted. They do not want the factory to harm the environment. They do not want the vehicles to pollute, smog to enter the air, and trees or open spaces to be destroyed.

Your ideas:

Your stand: **For** or **against** the factory (circle one)

Background Information Sheet

Proposed Factory Owners

Positives: They want the factory so they can make money. They want to provide jobs for unemployed, increase community involvement, help the local economy, and increase the tax base that supports local schools, roads, and hospitals.

Your ideas: