

Learning Activity Template

Title: Biomass Project

Curriculum: Integrated 7-12 curriculum including Math, English/Journalism, Science, Art, Health/PE, Spanish, Music, and Technical Education

Grade-Level Span: 7-12

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PURPOSE: To have students investigate and communicate the cost, feasibility, long term effects, and community impact of resources used for the generation of electricity.

DESCRIPTION: Students will use technology in each subject area to investigate biomass and non-renewable resources as related to that content area and the current Iron Range Biomass Project.

ACTIVITIES	Curriculum Standards	Minnesota Technology Standards	ISTE-NETS	Information Literacy Standard	Big 6
Math- Transportation cost differential	I, II, III	I,II, IV	2,4,8	1,2,3,7,8	All
Social Studies- Research/debate community attitudes on Biomass Project	IIG4, VIB, VIIA	I, II, III, IV	G,H,I, J, K	1,2,3,4, 6,7,8,9	All
Science- Quantify energy efficiency of various biomass materials as compared to coal	IB, IVF, IIC	I,II,IV	A1, C4,C5, E1	1,2,3,5,9	All
English – Documenting the story of the Biomass Project through multimedia	IID,IIE, IIIC	I,II, III, IV	3,4,5, 7,8,11	1,2,3,4, 5,6,7,8,9	All
Art – Claymation/Animation of logging process	Create	1, IV	N/A	N/A	All
Spanish – Newspaper article in Spanish regarding the Biomass Project	N/A	I,II,III, IV	1.1, 1.2, 1.3	1,2,3,5, 6,7,8,9	All
Music – Compose an energy related song	Create and Perform	I, II, III,IV	N/A	1,2,3,4, 5,6,7,8,9	All
PE/Health – Effect of power plant emissions on our health	N/A	I,II, III, IV	N/A	1,2,3,5, 6,7,8,9	All
Industrial Tech. – Investigating the engineering aspects of the Biomass plant	Constr-uction	I, II, IV	N/A	2,3,5	All

TOOLS AND RESOURCES:

For the entire unit of study the school needs: Internet capable computers, printer, calculators, computers equipped with the Excel program, telephones, online survey creator, newspapers from the Iron Range, digital video camera, video tapes, VCR, various types of wood, coal, steel cans, thermometers, matches, data tables for science experiment, NASA website, computers equipped with i-movie, projectors to hook up to computers, drafting tools, digital camera, clay, toy trucks, art supplies, current health and science magazines, musical instruments, recording equipment, microphones, decibel meter, Spanish/English dictionary, word processing program.

ASSESSMENT:

Students will, in all areas, be evaluated on the quality of the work and the use of work time on the various projects. Within each discipline, they will be evaluated as follows: Math – Can the output be determined by looking at the graph?, Does the information match published information?, Student evaluation on the speed and accuracy of the method they used. Social Studies – The number and quality of survey replies received, the preparedness of each side of the debate, Decision of panel, Student evaluation of how they would present differently. Science – Comparison of data to published data and the closeness of the results of the students to that published data, Student evaluation of lab technique, use of lab time, sources of error, and % error. English – Did students follow the expectations and criteria of the project?, Class evaluations of each video documentary. Industrial Tech. – Process of investigation and their drawing of the Biomass plant. Art – Self evaluation of finished product. Teacher’s grading scale of required elements. PE/Health – Visitors to the health fair critique each booth. Teacher’s grading scale of required elements. Music – Peer evaluation of musical composition. Teacher’s grading scale of required elements. Spanish – Difficulty the students had with the task. The accuracy of Spanish grammar and language usage. Teacher’s grading scale of required elements.

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COMMENTS: For a complete teacher’s resource guide, unit plan, and more information regarding this project, please contact one of the teachers listed above at their e-mail address.

Portions of this project have been used with students to great success. They enjoy the student directed, hands on approach to these activities.