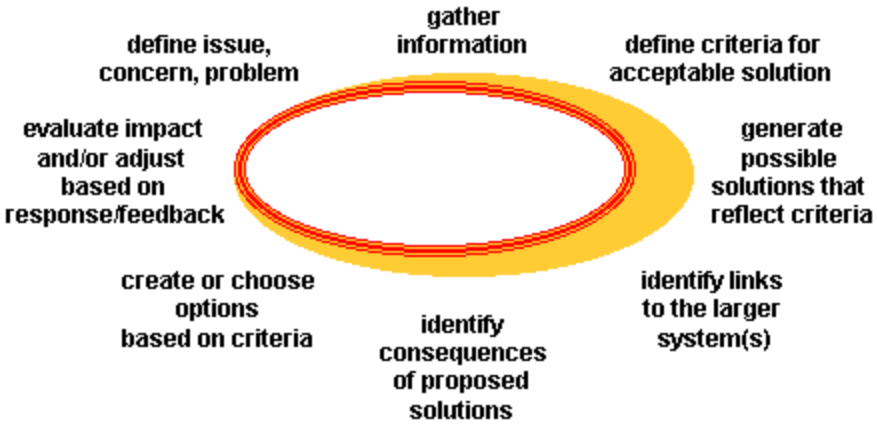
Is That Your New Car?

LEARNING AREA: Economics and Business
EDUCATION LEVEL: Middle School
CONTENT STANDARD: Technology Applications

A student shall: use appropriate technology to access, evaluate, and organize information and to produce products by:

1. Gathering and evaluating information from electronic sources;
2. Applying appropriate technology processes to an identified need or problem;
3. Producing products and selecting language, format, and graphics appropriate for purpose and audience by using word processing, graphics, multimedia, spread sheets, and databases;
4. Maintaining, using, or creating a technological system.

Large Processes/Concepts-----



NEXT STEP: Assessment Task

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Assessment Task-----

(3 week unit on land transportation research & development)

DESCRIPTION:

After learning about a brief history of land transportation and the six technologies of transportation, class will discuss some of the historical, environmental, social, economic, political, and technological impacts on personal transportation in the United States in the past decade. Students will then form design teams consisting of three to five students each to research a new or improved method of personal transportation for the year 2010. Each team will select an aspect of transportation (vehicle cost, fuel efficiency, power source, support system, load capacity, etc) and propose a new or modified example of land transportation vehicle to fulfill their own criteria. Research will be required in order for students to learn about design modifications and improvements to this point. The group must compile a set of data for their portfolio to document their findings. A graphical representation of historical changes over at least the past 50 years will be required in the group's final presentation. The team will design and construct a prototype of their 2010 vehicle and be prepared to demonstrate how it would be an improvement on existing transportation technologies. An oral presentation by the group using PowerPoint will allow the group to "sell" their proposal to a panel of experts (the rest of the class) by documenting their proposed form of transport.
(Note to Instructor: Although this activity is written to promote thought about personal forms of transportation such as cars, motorcycles, etc., students who show interest in other modes of transportation should be allowed to expand the scope of this activity to fit their interests)

PRODUCTS/EVIDENCE OF LEARNING:

Research Data Log: This group information will be included in each student's portfolio to document specific data content and the source from which it was located. A minimum of three different sources is required.
Daily Journaling: Each student will keep a detailed account of his or her daily involvement in the project.
Historical Changes: This graphical requirement can be of any type that will be included in the PowerPoint presentation. It must convey the team's research in an easy to understand form.
Vehicle Prototype: A non-working physical model of the vehicle is to be made no larger than 16" long and no smaller than 6" long.
PowerPoint Presentation: Using a minimum of five slides, this three to six minute presentation may show any part of the design process/vehicle development that the team chooses in order to promote their vehicle. All members of the design team must speak for part of the presentation.

OVERVIEW:

Design Challenge: The United States has become very reliant on personal forms of transportation. Historical modifications and improvements have altered the way individuals travel throughout our cities. As times change, various economic, environmental, social, technical and other factors put pressure on vehicle manufacturers to make changes to their designs. This activity is proposed to introduce students to the many factors that must be considered when developing a new product (vehicle). Researching historical vehicles should give students an appreciation for the technical advances of the past as well as a curious hunger for possible changes in the future. Textbook information will be presented from the book "Transportation"- TechKnowledge Reference Series by Thompson Learning Tools

Day 1: Introduction
The first day will be spent giving a brief overview of the design challenge. The Instructor and the class will discuss information from Chapter 1 including the forms of transportation, the six transportation technologies, and decision making influences. Students will be required to read and take notes on chapters 2 & 6 on their own within the next week.

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Day 2: Design Teams
The class will brainstorm some possible improvements they can think of for transportation in the near future. This information will be used to help students select team members based on similar interests/ideas. Students will create their own group of three to five members to become design specialists for a new or improved form of personal transportation for the year 2010.

Days 3-5: Research
After preliminary research, each team will select a particular aspect of land transportation to improve upon such as fuel efficiency, cargo/passenger capacity, propulsion source, speed, guidance, etc. Teams will conduct research using a minimum of three different sources including written materials, personal interviews, Internet, and other electronic means. Documentation of their findings must be compiled into a data table to be used for their final presentation.

Day 6: Progress Check
Each group will give a one to two minute review of their work to this point. Design teams are encouraged to assist with information that could benefit other teams.

Day 7-9: Design Development
Teams will continue research as needed as they develop ideas, sketches, and finally a drawing of their proposed vehicle of the future. Labels and written information concerning the car should be included on the final drawing. The final drawing may be generated on the computer or by hand but must be included in the final presentation. The construction of the prototype (6"-16" long) may be done out of any available material such as modeling clay, foam core board, balsa wood, Styrofoam, plastic, etc. Any other supporting details/models may also be included to explain the team's vehicle design.

Day 10-12: PowerPoint
Information is to be compiled over the next three days into a PowerPoint presentation that includes a minimum of five slides. The total time allowed for the team to present their information is between three and six minutes in length. Each team member must demonstrate their understanding of the content knowledge by properly using and applying technical terms where appropriate and being able to answer possible questions from the audience. Each member must be prepared to speak for a minimum of 15 seconds.

Day 13 (and possibly Day 14): Presentation Day
Teams will present their research and design proposals in front of the class as if they were proposing their ideas to a board of experts to secure monetary funding for their vehicle. Each team must present their PowerPoint presentation, supporting details, and display their prototype in the time period of three to six minutes. Questions may be asked by members of the audience at the completion of each team's presentation.

Final Day: Group Discussion
The entire class will discuss some of the interesting information they discovered. Special areas of interest such as fuel efficiency or alternative sources of propulsion should be discussed, including the reasons that changes are often opposed by certain groups or individuals. The class will conclude by taking a vote on their favorite new vehicle. Prototypes should be placed in a display case somewhere in the school to promote further thought and/or discussion.

NEXT STEP: Checklist

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Checklist-----

STUDENT	TEACHER	
_____	_____	The student kept a detailed journal of their daily participation throughout the project in his or her portfolio.
_____	_____	The student included appropriate notes and detailed information within his or her portfolio.
_____	_____	The design group created a research data log that included relevant information from at least three documented sources.
_____	_____	The team's proposed vehicle was well thought out and supported by their research.
_____	_____	The PowerPoint presentation included at least five different slides that documented the vehicle design and lasted between three - six minutes.
_____	_____	The historical changes were documented in an easy to understand graphical form on one of the slides.
_____	_____	Individual team members participated at least 15 seconds during the presentation.
_____	_____	The final drawing documented the ideas, systems, and construction of the proposed vehicle.
_____	_____	The prototype was completed according to the requirements and used during the presentation.
_____	_____	The design group members were knowledgeable and able to appropriately answer questions from the audience after their presentation.

Important! All parts of the listed criteria must be met for a specific score to be given.

Exemplary- To receive a score of 4, a student:

- Develops an original, complex question, hypothesis or position that can be answered through investigation or research.
- Collects data and records comprehensive, relevant information from a variety of sources, to answer a ques tion, support a position or test a hypothesis.
- Analyzes data and draws logical conclusions with comprehensive evidence to answer a question, support a position or evaluate a hypothesis.
- Clearly and creatively communicates findings/displays information in a well-planned original format.

Proficient- To receive a score of 3, a student:

- Develops a clearly focused, open-ended question, hypothesis or position that can be answered through investigation or research.
- Collects data and records sufficient relevant information from a variety of sources, to answer a question, support a position or test a hypothesis.
- Reviews data and draws conclusions with sufficient evidence to answer a question, support a position or evaluate a hypothesis.
- Clearly and accurately communicates findings/displays information in an appropriate format.

Novice- To receive a score of 2, a student:

- Develops a somewhat focused, open-ended question, hypothesis or position that can be answered through investigation or research.
- Collects data and records limited relevant information from multiple sources, to answer a question, investi gate a topic or test a hypothesis..
- Summarizes data with limited interpretation.
- Adequately communicates findings/displays information in a simple format.

Emerging- To receive a score of 1, a student:

- Develops a simple question, hypothesis or position that can be answered through investigation or research.
- Collects data and records minimal information from limited sources and superficially answer a question, investigate a topic or test a hypothesis.
- Selects data but does not interpret data or misrepresents data.
- Poorly communicates findings/displays information and has many errors.

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