Procedural Reading

LEARNING AREA: Read, Listen and View
EDUCATIONAL LEVEL: Middle School
CONTENT STANDARD: Technical Reading

A student shall demonstrate the ability to comprehend technical information from documents or electronic media by:

1. Knowing relevant technical vocabulary, use of tools, and safety procedures.
2. Applying step-by-step directions using appropriate tools and safety procedures.
3. Showing an understanding of information from visual or graphic data.

Large Processes/Concepts---

Next step: Assessment Task---

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Procedural Reading continued---

Assessment Task---

Description:
Students create products, follow procedures, complete projects, or do tasks by reading technical instructions and visual data.

Products/Evidence of Learning:

1. Construction of styrofoam airplane
2. Construction of 2 x 4 truck
3. Bicycle repair task
4. Demonstration
5. Proper use of tools and machines
6. Test/examination of readings
7. Final projects
8. Safety procedures

Overview:
The student will make two projects and do one task. In each project or task, they will learn either all parts of the systems of transportation ie; propulsion, suspension, guidance, control, support, and structure (materials). The ownership of each student to their project or task is individual, but yet group sponsored.

1. The class should be set up in a module/station/group interactive class. As a class of 30 students, the students will be divided up into six groups of five. (Note that four in a group is more conducive to group cohesion.) In the discussion here, remember that you have six stations in place, but we are delineating only three here. That means the teacher can plug in three additional stations of their choosing. These can either be about transportation or from another type of performance package.
2. Each task or project length will be scheduled on a four day rotation. Each student should try to finish the task or project length scheduled during that time.
3. Once the students have completed the first rotation of four days, they will move to the next rotation. The rotations should be posted on the board the day before the change. On day one of the new rotation, a student from the previous rotation should be appointed as teacher and should stay in the previous rotation for up to one period to teach the newly rotated students. Each student will have a turn in teaching.
4. The Bicycle Repair station will consist of six sub-tasks. A bicycle should be actually cut up and clamped to a table or bench. The sub-tasks include, but are not limited to, taking apart and putting back together the chain, seat, handle bars, tire, fork, and pedals. The students are asked to consider the systems of transportation, but in this task, the concentration should be on the support system of transportation.
5. In Bicycle Repair, each student has a check-off sheet. Each task should be initialled by the teacher when completed by the student.
6. The assigned research and technical reading about the bicycle is up to each student to complete. In addition, the students should be encouraged to do research on their own and write a report on some phase of a bicycle connecting that report to the support system of transportation.
7. Each student will be making a styrofoam plane out of a styrofoam food tray and other parts provided. This plane is rubber band driven and therefore the systems of propulsion, suspension, guidance, structure and control can be reinforced. The forces of flight, lift, drag, gravity and thrust can be taught.

Next step: Assessment Task continued---

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Procedural Reading continued---

Assessment Task---

8. The students will demonstrate flight by completion of the airplane and flying it. The demonstration flight can be on an individual or competitive basis.
9. Demonstration, reading the directions for assembly, and readings provided will enable the students to begin their interest in aviation (Atmospheric Transportation). All students are encouraged to go beyond this introduction and research and write a short report on some part of aviation.
10. Each student will be making a wooden truck from basic wood materials. The main frame is made of 2 x 4 ten inches long. The back is made from a flat 1 x 4 or 1 x 6. Small wheels should be provided using a dowel for support and turning.
11. The transportation systems can all be reviewed in building the truck. However, Land Transportation is the goal of the learning in this station. The inter-modal types of transportation can be initiated here.
12. Demonstration of learning in the truck station will be accomplished by completion of the project and demonstrating its ability to maneuver. The students should be encouraged to name a number of raw materials, finished products, and machines that can be hauled by trucks.

Check list---

STUDENT	TEACHER	PROJECT COMPLETION
_____	_____	Instructions are accurately and safely followed.
_____	_____	Use of tools and machines are appropriate and safe.
_____	_____	Conservation of materials is established.
_____	_____	Technical vocabulary is demonstrated.

STUDENT	TEACHER	TECHNICAL READING
_____	_____	Knowledge of technical terms and vocabulary.
_____	_____	Knowledge of safety and use of tools and machines.
_____	_____	Functional ability to follow step by step directions.
_____	_____	Understand information visually and from graphic data.

Next step: Check list continued---

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Procedural Reading continued---

Check list---

STUDENT	TEACHER	TEST AND REVIEW
_____	_____	Ability to research and write a report
_____	_____	Action and interaction with the group
_____	_____	Teaching the station
_____	_____	Completing the project and or task

STUDENT	TEACHER	DEMONSTRATION
_____	_____	Airplane flight
_____	_____	Truck mobility

STUDENT	TEACHER	EXPANDING EXPECTATIONS
_____	_____	Introduction to transportation
_____	_____	Thought process initiated
_____	_____	Interest accentuated/peeked
_____	_____	Reference point established
_____	_____	Awareness evolving

Possible Book Resources

Transportation, TechKnowledge Reference Series, Author: Dr. Anthony E. Schwaller
Flying Food Trays, Scholastic Futures Publishing, Author: Allen W. Hayes
Exploring Technology, Delmar Publishers, Inc., Author: E. Allen Bame, Paul Cummings
Transportation, Activity ACT Manual, Author: Deold, Sheets, Alexander

Web Sites:

Minnesota Department of Transportation
www.mnaero.com

Federal Aviation Administration
www.faa.gov

NASA
www.hq.nasa.gov