Ontario Council for Technology Education

Elementary Technology Education Newsletter

OCTE Mission:
Together we will establish a strong, consistent, accountable and sustainable technological education for all students in Ontario.

Volume 2, Issue 1
Winter Edition, 2006-2007

Greetings from our OCTE Chair

Welcome to the second OCTE Elementary Technology Education newsletter. OCTE is a volunteer organization which represents teachers of technology education from kindergarten to graduation. At present we have more than 400 members. OCTE is committed to providing increased support for technology education at the elementary grades. OCTE strongly believes there is a need to strengthen and enhance technology education in Grades 1- 8. I would like to invite you to join our OCTE team in making this initiative happen. Enjoy this issue of our newsletter. We look forward to your comments and input.

Art Niezen, OCTE Chair

Art Niezen,
Executive Director
Georgina Trades Training Inc. (GTTI)
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Inside this issue:

Don't Miss This Date!!!

In case you haven't yet heard OCTE is holding its 2007 Conference, *Agents of Real World Change*, at the Nottawasaga Inn from May 10 - 12, 2007. Your elementary committee has been busy in the planning of this event. A selection of workshops designed for elementary teachers, especially those teaching grades 7 and 8 will be offered. Each workshop is specifically designed to provide teachers with hands-on activities that can be used in both the science and technology classroom or the technology centre setting. This is your opportunity to meet with other elementary teachers, just like you, from around the province. Together you will share your ideas as you participate in the designing, building, testing and evaluating of projects that meet the standards for an excellent technology program. We guarantee you won't walk away empty handed.
Time is growing short. For more information and to download your registration form go to:

www.octe.on.ca/upcoming.shtml

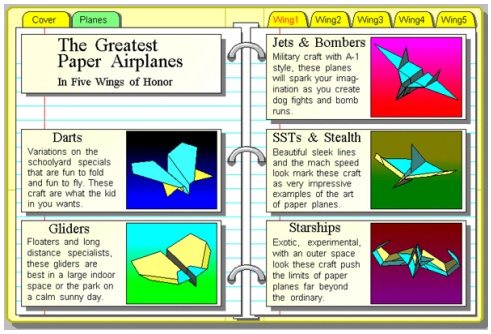
Registration and payment must be received by **April 26, 2007**. Your payment will confirm your registration. A large block of rooms is confirmed at the Nottawasaga Inn Resort until **MARCH 9th, 2007 for OCTE. Call: (800) 669-5501 or (705) 435-5501 for reservations**. $64.00 per person/double room; $128.00 per person/single (per night, plus taxes). Book your room now so you won't be disappointed. See you there!

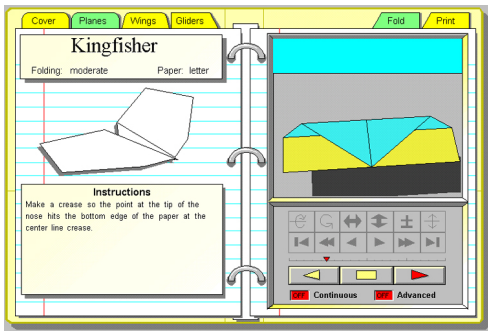
Software In Review

Greatest Paper Airplanes

Type of Program: Paper Airplane Folding

- Supported Platforms: Win 3x/95/98/2000/Macintosh
- Company Name: KittyHawk Software
- Version: 1.0
- Price: $29.95 for CD version; $19.95 download over the Internet
- Installed Size: 800 KB
- Contact Information: Website: http://www.khs.com





The kids user friendly program has three sections: a history and science of flying, a history and a science of paper, and the actual paper airplanes themselves. There are fifty planes that are featured, with difficulty of construction rated easy, moderate, or difficult. It features a notebook interface with VCR-style buttons to control the animation (e.g. play forward, backward, continuous play, etc.).

The program walks you through the folding process by means of a video accompanied by text. The paper used in the video instructions is coloured differently on each side. This makes following the folding process much easier especially for children. You can set the video to stop after each step and replay any step missed. Alternatively you could watch every step before you start. Where it is appropriate accompanying text will explain anything that is not made obvious in the video. The authors have done an excellent job of making this program easy to follow for maximum student success.

Checkout This Website

- It's been developed by the California Dept. of Education and is designed with safety and success in mind.
- Projects range from hand made batteries to a "Whirling Watcher" and cover a wide range of science principles.
- The directions are very well written, easy to follow and the projects are generally made from readily available materials.
- As well as materials lists and directions, there is a summary of what the students should observe and an explanation of the science principles involved.
- There are also extensions to the activities.

Great activities for students of all ages!

SNACKS EXPLORATORIUM SNACKS

Bon Apetit!

http://www.exploratorium.edu/snacks/index.html

These pages are full of Snacks ... but they're not the kind you eat. They're the kind you can learn from and have fun with.

Playground Equipment: Grade 1

Structures and Mechanism: Everyday Structures

Introduction: Big Ideas

Everyday structures are used to hold something, cross over something, provide protection, or provide recreation. Everyday structures incorporate identifiable shapes and patterns.

Prior Knowledge and Skills Students will need to be familiar with in order to complete this activity:

- Measuring
- Cutting, gluing, fastening
- 2-D shapes and 3-D figures

Materials: Hack saw, mitre box, carpenter's glue, low temperature glue guns and glue, cardboard, 1 x 1 cm basswood, craft sticks, gussets, joiners, crayons, paint, stickers, pencils, markers, found materials (e.g., toilet paper rolls, pipe cleaners, lids, spools, corks, etc.)

Expectations:

Overall

- Design and make structures that meet a specific need

Specific

- Design and make different structures using concrete materials and explain the function of the structure
- Ask questions about and identify needs or problems related to structures in their immediate environment, and explore possible answers and solutions
- Plan investigations to answer some of these questions or solve some of these problems
- Use appropriate natural and manufactured materials to make structures
- Select appropriate tools and utensils
- Use tools appropriately when joining and shaping various materials

Task Description:

You are a builder who has been asked by the town council to build a playground structure that serves the community.

You will create a model of a piece of playground equipment using at least one simple frame and connecting pieces made from 1 cm X 1 cm basswood, craft sticks, and other found materials.

You will display your playground equipment on a large piece of paper representing a map of your playground, including landscaping (e.g., trees, bushes, ponds) and pathways.

Evaluation and Assessment:

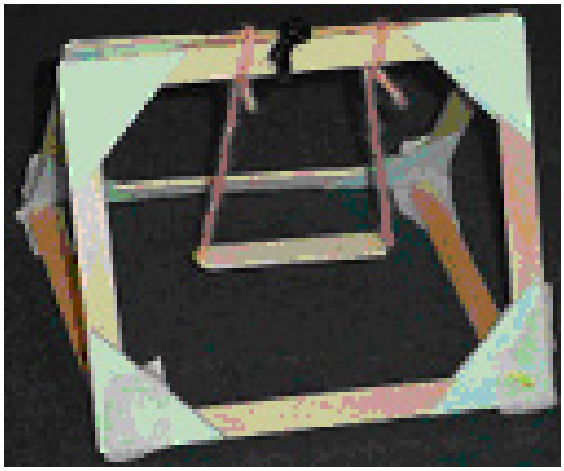
Evidence of Learning

- Model of structure and display

Criteria

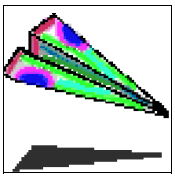
- Safe and accurate use of tools
- Appropriate use of tools and materials
- Model stands on its own
- Sides are straight
- Parts of model move as intended

Note: This is a sample of a student's playground structure design that could be made.



Paper Airplanes: Grade 6

Matter and Materials - Properties of Air & Characteristics of Flight



Introduction: Fasten your seat belts! With this project students will learn about aerodynamics principles. They will decide which type of airplane best represents their group while applying their technical literacy skills to create this paper airplane.

Prior Knowledge and Skills Students will need to be familiar with in order to complete this activity: The Bernoulli's Principle

Materials: Paper 8.5" X 11" recycled or origami paper (coloured differently on each side), Greatest Paper Airplanes software (see page 2) or use this alternate web site http://www.paperairplanes.co.uk/nickplan.php "Nicks Airplane", measuring tape, paper strips 5x15 cm, pencils and paper for recording observations, hula-Hop, jumbo paper clip, scissors, rulers.

Pre Activity: The Bernoulli effect is an explanation of how the wings of airplanes help generate lift for an airplane. Students can perform this activity to help understand this concept. Directions: Using a strip of paper about 5x15 cm. Student should place the narrow edge just below their lips so the paper arches down. Blowing over top the paper students will notice that the fast moving air on top has caused a lift. The faster the air, the stronger the lift. Compare this to an airplane by looking at the side view of the wing.

Scenario: This challenge is based on design issues for a passenger airplane. Passengers want to go far, fast, and remain safely in the airplane. Airplane operators want the planes to travel the shortest route (straight) in order to save fuel. You will construct a paper airplane which will hold it's passenger safely in place during flight. The plane which travels the farthest distance, in the shortest time, demonstrating relative accuracy while keeping the passenger safely on board will be deemed the successful. Score = velocity x distance.

Task Description: Using The Greatest Paper Airplanes (Kitty Hawk) Software, or visiting http://www.paperairplanes.co.uk/nickplan.php "Nick's Airplane" or http://www.paperairplanes.co.uk/fish.php "Flying Fish" students follow the step by step video and the pictorial directions to create their plane. Students may also choose to freely design their airplane.

Design Specifications:

- The airplane must be made from only the paper provided. No other materials.
- The "passenger" will be a jumbo sized metal paper clip.
- The plane will be hand-launch from behind the starting line.
- Only one person may throw the plane per flight. Total of five (5) flights.
- The plane must pass through the hula-hoop (accuracy) to be counted.
- The plane will be timed from start of flight until it comes to a full stop to determine its distance traveled. This measurement is used to determine the planes speed (V= DxT).
- Paper clip must remain attached or inside the airplane for flight to count.
- Each plane must have the team number on it. It may also have a name on it.
- The plane must resemble a plane (two wings, and a nose). Paper balls do not count

Assessment and Evaluation:

Evidence of Student Learning: design notes and drawings, accurate terminology (lift, drag, etc.) design model and oral presentation show understanding of key learnings, plane performance.

Designing and Building An Action Game: Grade 8

Structures and Mechanisms - Mechanical Efficiency, Fluid Power

Introduction: This project can be done individually or in groups of two. Students design and build their game after constructing the base structure seen in the diagram below. Maze games work well.

Prior Knowledge and Skills Students will need in order to complete this activity:

- How to use appropriate techniques and materials for building structures
- How to set up fluid power systems to achieve maximum mechanical advantage.

Materials:

- 1 piece of wooden dowel (supports the game board)
- Game board 30 cm x 30 cm. can be made from a thin piece of hardboard or from a thick piece of cardboard
- 4 syringes preferably 2 different sizes (provide the force to move the game board). The follower syringes are placed in diagonally opposite corners through holes drilled in the game board
- 1 piece of plastic tubing about 100 cm long
- 1 block of wood about 10 cm long (a piece of 2x4 would work well for the base for the game)
- Strips of wood to create the game surface ("jinx" wood or Popsicle sticks)
- Marble or game pieces

Scenario: The Internationally famous firm of "Games R Us" is looking to expand into the educational market. They would like to produce games that are educational but yet are entertaining and interesting, especially to teenagers. The "Games R Us" game designers, feel that a game involving pneumatics and hydraulics would be suitable but do not have the knowledge necessary to create a game of this type. They have therefore approached you to design and construct a prototype (model) of a game that meets the following design specifications (requirements). Final proposals, including prototypes, are due at the close of business on _____(date).

Design Specifications The game must:

- be operated using hydraulics or pneumatics (the syringes are used to control the rolling movement of the marble through the maze design on the base)
- be challenging enough to hold the interest of a teenager
- there must be a place provided for the storage of all loose parts
- be constructed out of the materials provided

Students will be required to submit:

- prior to the building stage - 3 rough sketches, final design choice, operations planning list.
- at the end of the design process - completed prototype, final design diagrams, self evaluation

Assessment and Evaluation:

Evidence of Student Learning: Design notes and drawings, working model, understanding of Mechanical Advantage, demonstration of knowledge of design process, presentation of design and model

Criteria: safe, appropriate, and effective use of materials and tools, design specification requirements are met, accurate Mechanical Advantage calculations, presentation shows understanding of key learnings, including use of design process.

How Safe Are Your Students?

Safety issues are a priority for the elementary teacher every day of the year. For teachers of technology this concern is multiplied many times over. All too often the classroom teacher **is** the technology teacher and he or she may have little safety training for running a technology program. Our last issue provided you with a variety of strategies for making your printed materials more easily interpreted by students of various reading levels. In this issue our **How Safe Are Your Students?** series will continue with a focus on "hand" tools.

Safety Question: When introducing students to the safe use of hand tools what strategies should be implemented?

Generally people consider hand tools to be inherently safer than power tools and therefore assume that using hand tools involves a lesser degree of risk. While it's true that any accident involving power tools is usually more severe than using hand tools, all tools have the same potential for difficulties if not used correctly.

Before allowing students to use any tools they must first be introduced to the General Rules for using tools safely. A checklist of such rules, should be completed prior to handling any tool and will always serve as a good reminder for all students. This should be easy to read, placed in a highly visible area immediately near the hands tool storage area. Students could complete this in written, verbal, self checking or monitored form depending on their level of maturity.

General Rules for Using Tools Safely

- ☐ All personal protective equipment such as eye protection is used. 
- ☐ Long hair is tied "out of the way" using an elastic band. 
- ☐ Long sleeves are rolled up and loose clothing tucked in to keep it out of the way. 
- ☐ Jewelry and watches are removed. 
- ☐ The material being worked on is secured or clamped in place (e.g., secured in a miter box which is clamped to the work surface or clamped to the work surface itself). 
- ☐ The tool being used is in good repair and cutting tools must be sharp. A dull tool is more dangerous than a sharp one because it requires more force to use and is therefore less easy to control. 
- ☐ The correct tool is selected for the task to be completed. Screwdrivers and chisels are not interchangeable tools! 
- ☐ The hand not on the tool is always kept well away from the tool and to the side of the tool. This "free hand" should be used to help hold the material. 
- ☐ He or She is mentally prepared and focused on the task at hand. Students need to be free from the use of alcohol or drugs (prescription or non prescription). 

Once students are well aware of these rules then the specific rules for individual tools will need to be introduced. This must be done through teacher demonstration.

Technology Look Fors

Have you ever asked yourself the question, "What should I see happening in a quality technology classroom?" In our last newsletter we shared with you our answer to this question in the form of the following visual diagram.

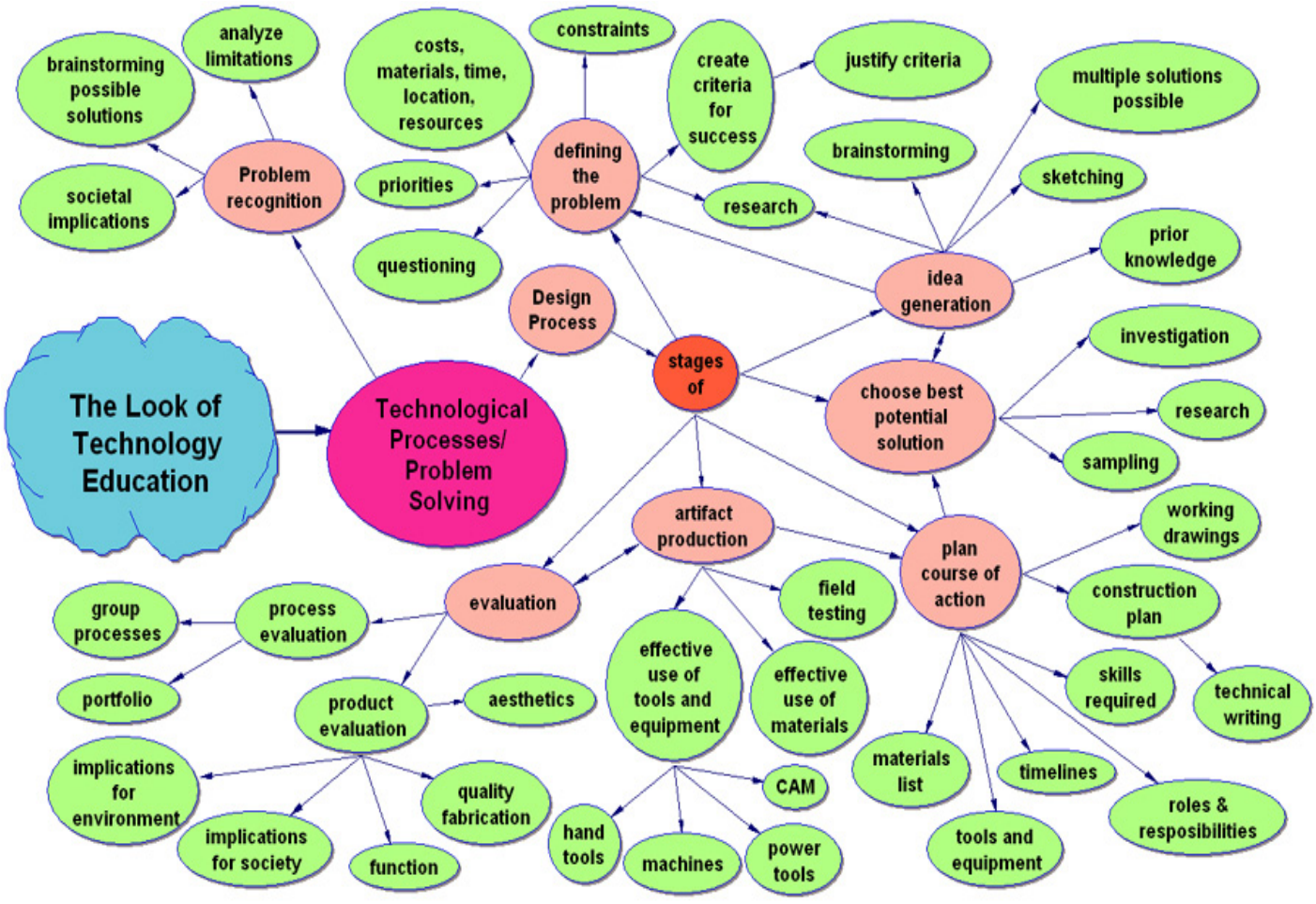
This integrated outline is intended to be used as a means to show non-technology trained educators what to look for to indicate that Technology Education, at the elementary level, is happening in a classroom. These indicators could also be used as a starting point for program planning.

The five key components which should be visible in a technology classroom would include: Risk Management, Technological process/Problem Solving, Student Engagement, Concepts and Knowledge and Communications. Each of these top level components can be broken down into more specific concepts.

Last month the Risk Management look fors were illustrated. This month the **Technological Process/Problem Solving** look fors have been highlighted.

Professionals involved in technology use a variety of problem solving approaches including troubleshooting, research and development, invention, innovation, experimentation, and the primary approach, technological design.

Technological design is commonly known as an engineering design process, which usually includes identifying a problem, investigating possible solutions, developing a plan, constructing and/or creating, evaluating, and communicating results.



Meet Your OCTE Elementary Technology Education Committee

In Spring 2006, our first ever Elementary Education Newsletter was unveiled at the OCTE Conference held at the Nottawasaga Inn, in Alliston, Ontario. Since that time we have received several inquiries asking, "Who are the people on this committee?" In our efforts to keep you informed we would now like to introduce ourselves to you. Our committee has been working diligently on your behalf as we lobby for the additional funding required to bring quality and sustainable technology programs for all students in all grades. Please feel free to contact us: if we could be of help to you, to share your ideas or to join our team.

Ron Ballentine
Vice-Chair, OCTE
Co Chair Elementary Technology Education Committee
ballentiner@hdsb.ca

Ron is Coordinator of Science and Technology and Environmental Education for the Halton District SB. This past year Ron worked on the Ministry Technology Curriculum Review and Writing Team. Ron has gained his 20 years experience as a classroom teacher (K-8) and in various consultant roles.

Cheryl Lovell
Vice-Chair, OCTE
Co Chair Elementary Technology Education Committee
Cherlove@cogeco.ca

Cheryl recently retired as a technology teacher, grades 7/8, from the Greater Essex DSB, Cheryl has recently been elected to the position of school board Trustee for the city of Windsor. Prior to retirement she served on the Ministry Technology Curriculum Review Team and other Literacy writing initiatives.

Bob Moulder
OCTE Elementary Committee
moulderr@hdsb.ca

A former Design and Technology teacher, Bob has made the transition to teaching Science and Technology by taking on the role as the Science and Technology Resource Teacher with the Halton District School Board. In this role Bob assists teachers of grades K - 8 in their efforts to implement "hands on" technology activities into their programs.

Todd Thorne
OCTE Elementary Committee
Todd.Thorne@dsbn.edu.on.ca

Todd has been teaching the past 15 years for the DSB of Niagara at the Elementary Design Centre for grades 7/8. He has also been a member of the Elementary Technology Writing team for his board. In addition to this, for the past three years, Todd has also been chair of the grades 4-6 Lego Robotics Challenge for Skills Ontario.

Otto Wevers
OCTE Elementary Committee
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Otto is presently serving as the Science and Technology Instructional Leader Educational Issues, grades 1-8, for the Toronto DSB, Otto's educational experience includes teaching grades 1-9, as well as the science and technology Additional Qualifications courses for teachers. Otto was a member of the S&T curriculum writing team.

Terry Wilkinson
OCTE Elementary Committee
terry.wilkinson@tel.tdsb.on.ca

Terry is a technology teacher for the TDSB and a continuing education instructor for OISE/UT. She also has a visual arts background and over her 18 year teaching career, has taught junior/ intermediate special education as well as math, science and technology for grades 6, 7, and 8.