

BAA TECHNOLOGY 10

DISTRICT NAME: Coquitlam

DISTRICT NUMBER: SD#43

DEVELOPED BY: Dennis Joel

DATE DEVELOPED: May 4, 2006

SCHOOL NAME: Riverside Secondary

PRINCIPAL'S NAME Chris Kennedy

BOARD/AUTHORITY APPROVAL DATE: June 20, 2006

BOARD/AUTHORITY SIGNATURE: _____

COURSE NAME: Technology 10

GRADE LEVEL OF COURSE: 10

NUMBER OF COURSE CREDITS: 4

NUMBER OF HOURS OF INSTRUCTION: 120

PREREQUISITE(S): None

SPECIAL TRAINING, FACILITIES OR EQUIPMENT REQUIRED:

Knowledge and skills in the principles and techniques of applied technology.
Technology education speciality. Knowledge of current technology and practices, and experience in shop setting.

Standard equipped Technology shop. This would typically be equipped with workbenches, basic woodworking and metalworking tools, and a supply of basic materials such as wood, metal, plastic and fasteners.

COURSE SYNOPSIS:

Technology 10 provides an opportunity for students to learn and express their creativity through applying techniques in design while generating solutions to existing technological problems. Students are encouraged to explore the diversity of technology while assessing how technology impacts our sociological needs. Students participate in various activities that give them a chance to acquire more technical skills in a variety of technologically related areas including material manipulation, fasteners and adhesives, simple machine functions, and electronics,. Students use digital cameras, and computers, to document and illustrate their ideas and solutions. The course concludes with each student completing their own passion project where they choose a specific problem to solve in consultation with the instructor. Students are given the opportunity to reflect and assess their progress on an on-going basis throughout the course.

RATIONALE:

This course was developed as a foundation program for all Technology courses including, effective lateral thinking with emphasis on creativity, problem-solving and developing technological skills. They will use the different characteristics of wood, metal and plastic and apply them appropriately in the creative process. At the same time, students will improve their technical knowledge by exploring the different uses and applications of fasteners and adhesives, simple machines and electronics. Models and prototypes of the inventions/solutions will be constructed. Throughout the course, students will use a combination of group work and individual work. Each student will be encouraged to maintain a journal of their ideas and a portfolio illustrating examples of their best work, specific skills attained and a reflection for each assignment.

ORGANIZATIONAL STRUCTURE

UNIT	TITLE	TIME
1	Design process, Project planning, task assessment and time management	
2	Safety	
3	Identifying and Manipulating Materials wood/metal/plastics/fasteners	
4	Simple Machines	
5	Electronics	
6	Designing, building a product	
Total Hours		120

UNIT 1: Design Process Project Planning, Task Assessment and Time Management

Students will become familiar with techniques required to design and create an invention. They will draw upon a variety of knowledge, skills and experiences to identify a potential solution to a (technological) problem. Through critical, creative, problem solving, ideas become reality as students create inventive solutions, illustrate their ideas, and make models of their inventions. This provides students with opportunities to develop and practice higher-order thinking skills required when analysing, synthesizing and evaluating a solution.

Curriculum Organizer – Design & Illustration Techniques

It is expected that students will be able to:

- Use a variety of drawing projection methods
- Identify and apply the essential elements of design and properly communicate their ideas using both two and three dimensional graphics manually and by computer assisted processes
- Select and create both a layout and illustration detailing the materials required to create your solution demonstrate the effective application of imperial and metric measurements
- Describe how ergonomics influences the design process

Curriculum Organizer – Planning

It is expected that students will be able to:

- Design and construct their own invention using all necessary criteria to successfully develop a solution to an existing problem
- Demonstrate an understanding of the different aspects involved when creating their solution including
- Direct/indirect cost involved with proposed solution knowledge, skills or attributes required to successfully complete their invention
- Layout of materials used in problem solving
- Time required to complete idea

UNIT 2: Safety/Use of Tools-Equipment/Conduct while in the Shop

Curriculum Organizer – Safety

It is expected that students will be able to:

- Explain the safety requirements and obligations required when in a technology shop.
- Demonstrate safe work habits while in the shop, when using tools, equipment, and technical processes and encourage the same in others.
- Demonstrate the specific safe use of hand and power tools

UNIT 3: Identifying and Manipulating Materials Wood/Metal/Plastics/Fasteners

Students will become familiar with three major types of materials (wood, metal and plastic) and how they can be applied to different situations. They will practice shaping, cutting, fastening and finishing these different materials by creating various solutions to a wide range of problems. Throughout the unit students will identify and explain when different materials should be reused and/or recycled. Students will also identify the specific characteristics such as tensile/compression strengths, brittleness, and toughness for each individual material and describe how to best use the specific material.

Curriculum Organizer – Plastic

It is expected that students will be able to:

- Classify and describe the characteristics of different types of plastic materials
- Explain the appropriate use of different types of plastic materials
- Describe ways to reduce material waste
- Demonstrate cutting and shaping methods

Curriculum Organizer – Metal

It is expected that students will be able to:

- Classify and describe the characteristics of different types metal materials
- Explain the appropriate use of different types of metal materials
- Describe ways to reduce material waste
- Demonstrate cutting and shaping methods

Curriculum Organizer – Wood

It is expected that students will be able to:

- Classify and describe the characteristics of different types of wooden materials
- Demonstrate the appropriate use of different types of wooden materials
- Describe ways to reduce material waste
- Demonstrate cutting and shaping methods

Curriculum Organizer – Fasteners

It is expected that students will be able to:

- Demonstrate a variety of ways to join wood, metal and plastic using a variety of joining techniques
- Demonstrate the proper use of different adhesives when using wood, metal and plastic
- Match materials to specific solutions based on there individual characteristics of each material
- Describe ways to reuse and recycle materials and products to reduce waste

UNIT 4: Simple Machines/Principles

Students will design and construct a device using several simple machines. All the principles and calculations to make the machines work correctly for the particular application will be applied.

Curriculum Organizer – Simple Machines

It is expected that students will be able to:

- Describe the different uses of the six simple machines
- Demonstrate the formulas and principles used with simple machines.
- Explain the following terms: force, effort, and work.
- Explain the principles of simple machines by drawing, demonstrating, and/or creating a simple or complex machine.
- Discuss examples of each of the different simple machines

UNIT 5: Electronic Principles/Tools/Techniques

Students will become familiar with the basic components of electronics and electricity. They will explore the potential uses of different components and construct a circuit using a variety of tools and components to perform a set task.

Curriculum Organizer – Electronic Principles

It is expected that students will be able to:

- Explain Ohm's and Kirchhoff's law and how they apply to circuitry
- Explain electronic abbreviations and component functions used in constructing circuits
- Describe the fundamental application of electricity
- Demonstrate the effective application of units and measurements
- Analyze basic electronic circuits and systems
- Create a simple electronic circuit

Curriculum Organizer – Specialized Tools and Techniques

It is expected that students will be able to:

- Demonstrate the proper techniques used when handling components
- Demonstrate the proper use of essential tools and techniques for designing and constructing electronic circuits
- Demonstrate circuit wiring using a component board
- Demonstrate safe conduct while working with or around tools and equipment

UNIT 6: Designing and Building the Product

Curriculum Organizer – Designing a Project

It is expected that students will be able to:

- Design and construct their own invention using all necessary criteria to successfully develop a solution to an existing problem
- Explain the specific characteristics of the materials being used and their suitability for the application

Curriculum Organizer – Building a Project/Use of Material

It is expected that students will be able to:

- Layout of materials used in problem solving

- Demonstrate time management skills required to complete project
- Demonstrate informed decision making and positive attitudes when solving problems that occur during the building process

Curriculum Organizer – Project Planning/Time Management

It is expected that students will be able to:

- Explain the different aspects involved when implementing their solution including storage direct/indirect cost knowledge, skills or attributes required to successfully complete their invention
- Explain a timeline based on the specific goals of the project

INSTRUCTIONAL COMPONENT:

It is expected that the teacher will use a variety of strategies and resources such as:

- Teacher led activities/Demonstrations
- Lecture
- Research project
- Student demonstrations/presentations
- Modelling/prototyping
- Discussion
- Brainstorming
- Questioning
- Team work

ASSESSMENT COMPONENT:

Will be based on the evaluations conducted throughout the course. This will reflect the students:

- Effective formative assessment via:
 - Clearly articulated and understood learning intentions and success criteria
 - Questions posed by students, peers and teachers to move learning forward
 - Discussions and dialogue
 - Feedback that is timely, clear and involves a plan
 - Students are resources for themselves and others – peer and self-assessment
 - Student ownership

Formative assessment used to adapt learning experiences and inquiry plans on an on-going basis to meet specific learning goals.

Development, awareness and action, based upon metacognition intended to lead to learner independence and self-coaching.

Summative Assessment:

Summative assessments will be determined as students demonstrate proficiency/mastery toward particular learning outcomes. Summative assessments and final grades will reflect the following:

- Students will work collaboratively with the teacher to determine summative achievement on assignments and letter grades based upon dialogue, and evidence of learning
- Behaviour and work habits will NOT be included when determining letter grades
- Marks will not be deducted for late work
- Extra credit and bonus marks will not be awarded
- Plagiarizing will not result in reduced marks/grades –the student will be required to demonstrate their learning authentically
- Attendance will not be considered toward letter grade
- Only individual learning demonstrated –no group marks – will be used to determine grades
- Letter grades will reflect learning towards the learning outcomes articulated above
- Letter grades will be based upon criteria provided/agreed upon toward the learning outcomes
- Letter grades will be determined in relation to the learning outcomes – not in comparison to the achievement of other students
- Poor work will not be assessed towards grades – students will only be assessed on quality work
- Professional judgment and evidence will be used to determine final letter grade in consultation with the student
- Zeros will not be assigned to missed assignments – all required assignments must be completed
- Formative or practice towards learning outcomes will not be included in final grade assessment
- Most recent evidence toward learning outcomes will be used to assign letter grades – learning is not averaged over time

LEARNING RESOURCES:

- British Columbia Inventors Society
- Articles and information about Inventors and Entrepreneurship on the internet

Sampling

- <http://web.mit.edu/invent/>
- <http://www.ibm.com/ibm/licensing/>
- <http://www.invention-help.com/>
- <http://www.cln.org/themes/inventors.html>
- http://www.noogenesis.com/inventing/pencil/pencil_page.html
- <http://www.nfte.com/>
- <http://www.entre-ed.org/teach/>