Board/Authority Authorized Course Framework Template

School District/Independent School Authority Name: Chilliwack School District	**School District/Independent School Authority Number (e.g. SD43, Authority #432):** #33
Developed by: Heather Elliott	**Date Developed:** November 1st, 2024
School Name: Learning Services – Curriculum Department	**Principal's Name:** Sean Wicker
Superintendent Approval Date (for School Districts only):	**Superintendent Signature (for School Districts only):**
Board/Authority Approval Date:	**Board/Authority Chair Signature:**
Course Name: Technology Explorations	**Grade Level of Course:** 12B
Number of Course Credits: 4	**Number of Hours of Instruction:** 120

Board/Authority Prerequisite(s):

Technology Explorations 12A

Special Training, Facilities or Equipment Required:

Technology shop space with assorted stationary, hand and power tool access.

Personal protective equipment – Safety Glasses, closed toed shoes, hearing protection etc.

Course Synopsis:

This course is designed for the further exploration of multiple areas of trades related training. It would provide students with the opportunity to explore a variety of ADST – Trades related subjects and the ability for cross-curricular activities and project work.

Goals and Rationale:

• Develop skills and knowledge of an occupation for future career choices
• Create possible future employment opportunities, job experience and portfolio
• Safety awareness
• Connect what is learned in the classroom with the skills, knowledge and attitudes needed in the workplace
• Gain the knowledge, skills, and attitudes needed to be successful in the world of work
• Understand the similarities and differences in behaviour standards between the workplace and school

Aboriginal Worldviews and Perspectives:

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves patience and time.
- Learning requires exploration of one's identity

Course Name: Technology Explorations **Grade: 12**

BIG IDEAS

Design for the life cycle includes consideration of social and environmental impacts.		Personal design interests require the evaluation and refinement of skills.		Tools and technologies can be adapted for specific purposes.

Learning Standards

Curricular Competencies	Content
Students are expected to do the following: **Applied Design:** *Understanding context* • Engage in a period of user-centered research and empathetic observation to understand design opportunities *Defining* • Establish a point of view for a chosen design opportunity • Identify potential users, intended impact, and possible unintended negative consequences • Make decisions about premises and https://curriculum.gov.bc.ca/curriculum/adst/12/woodwork constraints that define the design space, and develop criteria for success • Determine whether activity is collaborative or self-directed *Ideating* • Critically analyze how competing social, ethical, and sustainability considerations impact design • Generate ideas and add to others' ideas to create possibilities, and prioritize them for prototyping • Evaluate suitability of possibilities according to success criteria and constraints • Work with users throughout the design process *Prototyping* • Identify, critique, and use a variety of sources of inspiration	*Students are expected to know at least six of the following from at least two curricular areas:* **Drafting 12** • complex drafting design projects • interrelationships among complex drawings • preparation of detailed drawings • components of working drawings • computer-aided design (CAD) programs and other graphic software management • modifying existing geometrical design using CAD software • 3D modelling using advanced modelling techniques • file conversion between CAD and other applications • areas of drafting specialization **Electronics 12** • complex circuit design and construction • Ohm's law, Watt's law, and Kirchhoff's law, and the conservation of current and energy within electrical circuits • functions of logic gates and devices • chemicals used in electronics • testing equipment for measurement and comparison of expected values • computer software for designing printed circuits • circuits for analog systems • circuits for digital systems

- Choose an appropriate form, scale, and level of detail for prototyping, and plan procedures
- Analyze the design for the life cycle and evaluate its impacts
- Visualize and construct prototypes, making changes to tools, materials, and procedures as needed
- Record iterations of prototyping

Testing

- Identify and communicate with sources of feedback
- Develop an appropriate test of the prototype, conduct the test, and collect and compile data
- Evaluate design according to critiques, testing results, and success criteria to make changes

Making

- Identify appropriate tools, technologies, materials, processes, cost implications, and time needed
- Create design, incorporating feedback from self, others, and testing prototypes
- Use materials in ways that minimize waste

Sharing

- Decide how and with whom to share or promote design, creativity, and processes
- Share the product with users and critically evaluate its success
- Critically reflect on their design thinking and processes, and identify new design goals
- Identify and analyze new design possibilities, including how they or others might build on their concept

Applied Skills:

- Apply safety procedures for themselves, co-workers, and users in both physical and digital environments
- Identify and assess skills needed for design interests, and develop specific plans to learn or refine them over time
- Demonstrate competency and proficiency in skills at various levels involving manual dexterity and complex techniques

Applied Technologies:

- Explore existing, new, and emerging tools, technologies, and systems to evaluate suitability for their design interests
- Evaluate impacts, including unintended negative consequences, of choices
- uses of microcontrollers
- alternating current (AC) and direct current (DC) circuit comparison and analysis
- electromagnetic induction as it relates to motors, electrical generation, and distribution
- standard layout and symbols for wiring and schematic diagrams
- interpretation of schematic drawings
- use of fibre optics in communication

Metal Work 12

- complex metalworking and design
- operation and safety of welding equipment
- casting methods
- incorporation of non-metal material in metalwork products
- finishing purposes and processes
- metal selection for specific applications
- sequence of steps when working with powered and non-powered equipment
- dimensional tolerance
- operation, maintenance, and adjustment of stationary powered and non-powered equipment
- areas of metal specialization
- sheet metal layout, forming, and fabrication
- heat treatment purposes and processes

Woodwork 12

- complex woodworking and design
- creation and use of working pictorial and written plans
- wood-related materials
- selection of wood based on its characteristics and properties
- layout and use of materials to minimize waste and conserve material
- operation, maintenance, and adjustment of stationary power equipment
- types and purposes of joinery
- analysis and identification of defects in wood
- methods for preparing wood surfaces for application of finish
- identification and analysis of building codes for applicable projects
- sequence of steps when working with power equipment
- sharpening procedures

made about technology use • Examine and analyze the role that changing technologies play in woodworking contexts	• types, purposes, and application of finishes **Automotive 12** • complex automotive repair and maintenance • vehicle inspection standards • advanced automotive tools and equipment • engine and vehicle modifications • vehicle diagnostic and assessment methods • transmission and gearing functions • electrical and control systems • mechanical systems • fuel systems • serviceability, overhaul, and repair

Big Ideas – Elaborations

Curricular Competencies – Elaborations

• research: seeking knowledge from other people as experts (e.g., First Peoples Elders), secondary sources, and collective pools of knowledge in communities and collaborative atmospheres
• empathetic observation: aimed at understanding the values and beliefs of other cultures and the diverse motivations and needs of different people
• Defining: setting parameters
• constraints: limiting factors such as task or user requirements, materials, expense, environmental impact, issues of appropriation, and knowledge that is considered sacred
• Ideating: forming ideas or concepts
• sources of inspiration: may include experiences; traditional cultural knowledge and approaches, including those of First Peoples; places, including the land and its natural resources and analogous settings; and people, including users, experts, and thought leaders
• plan: for example, pictorial drawings, sketches, flow charts
• iterations: repetitions of a process with the aim of approaching a desired result
• sources of feedback: may include peers; users; keepers of traditional cultural knowledge and approaches, including those of First Peoples; and other experts
• appropriate test: consider conditions, number of trials
• technologies: things that extend human capabilities
• share: may include showing to others, use by others, giving away, or marketing and selling
• product: for example, a physical product, a process, a system, a service, or a designed environment

Content – Elaborations

Recommended Instructional Components:

Instruction should be provided in a manner that connects with different types of learners: visual, auditory, and written. For example, a lesson may be taught that utilizes lecture, includes visual aids and group discussion, and handouts or notes that the students can take away for later processing of the information. Then a physical demonstration can be made before students utilize the new skill by making a project of their own.

Recommended Assessment Components: Ensure alignment with the Principles of Quality Assessment

- Ongoing formative assessment is provided throughout the course
- Rubrics are used with clearly defined expectations. Students will perform self-assessment on their personal work and their group work.
- Written feedback will be provided on the completion of different components of projects.
- Students will demonstrate understanding of important facts through written work and quizzes.
- Summative Marks and comments will be made public (via MyEd or other) to students and parents on an on-going basis.
- Communication with parents of students will be made as necessary to keep them informed and involved in their student's success. This may be done by face-to-face meetings, phone, email or other digital communications.

Learning Resources:

- Digital presentations
- Classroom Hands on Demonstrations
- Textbook resources specific to the subject module – ie: Exploring Metalworking – Basic fundamentals: John A. Walker

Additional Information:

Maximum enrolment 24 students per block