**Course: Technology Explorations 10 - Engineering 10**

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## Course Description:

In Technology Explorations 10, students learn that user needs and interests drive the design process; that social, ethical, and sustainability considerations impact design; and that technologies help us accomplish many specific tasks in our lives.

Technology Explorations 10 is an engineering type, design-challenge based course in which students design, draft and fabricate projects to solve problems. Whereas Engineering 9 projects are primarily made of wood, Engineering 10 students learn metalworking skills prior to designing, drafting and fabricating metal-based projects to solve problems. The following skill developing projects are typical: toolboxes, whistles, hammers, welded steel dice, slide whistles, coat racks, etc. The following design challenge projects are typical: metal sculptures, towers, bridges, trebuchets, robotic arms, woodstoves, go-karts, etc. As well as practical skills, students learn transferable life-skills such as problem solving, work ethic, perseverance, and collaboration. Safety is emphasized in the use of power tools.

The overarching inquiry question of the course is ""How can we design and fabricate products to meet our needs?"

## Course Expectations:
It is expected that students will:
- Abide by the student Code of Conduct
- Adhere to the Academic Honesty policy
- Respect themselves and others
- Attend every class and be punctual
- Inquire, think, and participate to the best of their individual ability
- Access technology in class for learning purposes only & only when instructed to do so
- Challenge themselves and have fun learning

*Seycove Learning policies can be accessed at:*
*https://www.sd44.ca/school/seycove/About/agenda/Documents/Seycove%20Agenda%20Book%20201 8-2019%20(final).pdf*

## Learning Plan:

| % | Evidence of Learning (Assessment) | Learning Plan |
|---|---|---|
| *80%* | Students will be assessed on the quality of production of their completed projects, | **What the students will know:**<br><br>ethics of cultural appropriation in design process<br><br>functions, uses, and role of portable and stationary power equipment in the creation of a project<br><br>function and use of hand tools<br><br>proper storage and organization of tools and equipment<br><br>selection of metal for size, shape, and finish<br><br>start-up, shutdown, and handling procedures for compressed gas cylinders<br><br>mechanical fasteners and fastening methods<br><br>methods for laying out, forming, and joining metal<br><br>drawing standards and conventions<br><br>scales for different types of drawings<br>drafting styles, including perspective, mechanical drafting, and architectural drawing |

**What the students will do:**

**Applied Design**

*Understanding context*

- Engage in a period of user-centred 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 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
- 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 woodworking techniques |
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| | | |

| 20% | **Summative Assessment** |
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Students' finished projects will be assessed for accuracy, and quality of fabrication.

| 100% | |
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