**Unit Plan**

**Teacher Candidate:** Ben Scoten **School Advisor:** Bob Miraftab **Faculty Advisor:** Theresa Magee

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| **Subject/Grade:**  Design & Technology 10 (Woodwork) | | **Introduction/Rationale:**  Students will develop a knowledge of basic furniture design and construction methods and apply their knowledge by designing and building a functional table. | **Prerequisite Skills:**   * Basic measuring |
| **Title of Unit:**  Furniture Design & Construction | **Length of Unit:**  10 Weeks  80 Min. Periods |

**Class composition:**

* Grade 10
* Mainly students with English as their first language
* Approximately 15% ELL students
* Approximately 15% of students have an IEP

**Accommodations for Differentiated Instruction:**

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| **English Language Learners** | * Provide texts from language of origin, with pictures of tools, machines, equipment and materials * Encourage students to research their tools, machines, equipment and materials using native language sources * Encourage fluent English-speaking students to assist ELL students |
| **Gifted Students** | * Gifted students who are more advanced will peer tutor those that are farther behind * Additional project options to choose from |
| **Cognitive/Physically Disabled** | * Students with cognitive or physical disabilities will be assisted individually by instructor and/or EA * Curriculum will be adapted to suit students’ unique situation. * Other students will be encouraged to help students with cognitive/physically disabilities |

**Prescribed Learning Outcomes for Subject:**

(Unit-specific in **bold**)

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| **Self & Society** | **Communications** | **Production** | **Control** | **Energy & Power** |
| • **contribute to group success by encouraging others to fulfill their responsibilities**  • identify role models in technological  occupations, including those that are sensitive to culture, gender, and physical ability  • explain relationships between technological advancements and changes in the workplace, including the changing roles of workers  • evaluate design ideas based on assessments by others  • **demonstrate a willingness to look for and develop improved solutions to problems that arise during the design process**  • express personal thoughts and feelings about how societal pressures may influence technological advancements and, conversely, how technological changes influence society and the environment  • **demonstrate confidence and positive attitudes when solving problems that arise during the design process** | • **communicate ideas for designing products and systems using various drawing projection methods, spreadsheets, graphics, or other media**  • use information-gathering and communication methods to solve problems during the design process and to create effective presentations  • revise presentations based on personal review and feedback from others  • describe the advantages and disadvantages of various information-gathering and communication processes  • **develop two- and three-dimensional**  **graphics using manual and computer-assisted processes**  • **identify how information and concepts from other fields of knowledge are used in the design process** | • use a design process to modify products to improve their appearance, usefulness, and  function  • **classify and describe the characteristics of industrial materials**  • **investigate and select materials to meet design specifications**  • devise and use assembly sequence diagrams and flow charts to explain a process or system  • devise a manufacturing process  • **identify new trends in manufacturing processes**  • **describe ways to reduce waste**  • **select and use a variety of finishes on products to improve their appearance and durability**  • **select and safely use hand and power tools in the manufacture of products**  • **demonstrate safe work habits when using tools, equipment, and technical processes, and encourage the same in others** | • **Demonstrate an understanding of the operating principles used in various control devices**  • Design and construct a system that uses a control device  • **Use troubleshooting strategies to locate the source of malfunctions in a system**  • modify electric, electronic, pneumatic, and mechanical control devices for particular  applications | • Explain how systems convert potential energy to kinetic energy, and assess their environmental and social implications  • Construct devices that convert and transmit various forms of energy  • **Disassemble devices and explain the transfer and conversion of energy within mechanical systems**  • Describe alternative sources of energy  • Incorporate selected devices in the design of energy transmission and conversion systems |

**Unit Plan by Date:**

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| **Week** | **Date** | **Lesson Topic(s)** | **Specific Lesson Objectives** | **Student Activities** | **Teacher Activities** |
| 1 | Feb. 2 | * Design research * Ideation Sketches | * Introduce project * Introduce research resources * Begin ideation sketches | * Research design ideas * Create ideation sketches | * Introduce project * Introduce research resources |
| Feb. 4 | * Design research * Ideation Sketches | * Continue with research and ideation sketches | * Research design ideas * Create ideation sketches | * Facilitate research and ideation sketches |
| Feb. 6 | * Design research * Ideation Sketches | * Continue with research and ideation sketches | * Research design ideas * Create ideation sketches | * Facilitate research and ideation sketches |
| 2 | Feb. 10 | Dimensioned drawings | * Understand basic dimensioned drawing standards * Begin dimensioned drawings | * Begin dimensioned drawings | * Introduce dimensioned drawing * Facilitate dimensioned drawing |
| Feb. 12 | * Parts lists * Dimensioned drawings | * Understand how to create a basic parts list * Continue with dimensioned drawings | * Begin parts list * Continue with dimensioned drawings | * Introduce making a parts list * Facilitate dimensioned drawing, parts lists |
| 3 | Feb. 16 | * Process plans * Parts lists * Dimensioned drawings | * Understand how to make a basic process plan * Continue creating parts list * Continue with dimensioned drawings | * Begin process plan * Cont. with parts list * Cont. with dimensioned drawings | * Introduce making a process plan * Facilitate dimensioned drawing, parts lists, process planning |
| Feb. 18 | * 1/4 Scale Prototyping | * Understand how to use 1/4 scale dimensions * Understand how to make a prototype model with cardboard and tape | * Observe lesson on 1/4 scale cardboard prototyping | * Lesson on 1/4 scale cardboard prototyping * Facilitate 1/4 scale cardboard prototyping |
| 4 | Feb. 24 | * Begin building | * Understand general shop safety procedures * Understand how to use basic shop machinery * Begin building table | * Observe demos (mitre saw, jointer, planer) | * Safety lesson * Demos (mitre saw, jointer, planer) * Facilitate building |
| Feb. 26 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Observe demos (thickness sander, glue-up, table saw) | * Demos (thickness sander, glue-up, table saw) * Facilitate building |
| **Week** | **Date** | **Lesson Topic(s)** | **Specific Lesson Objectives** | **Student Activities** | **Teacher Activities** |
| 5 | Mar. 2 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Mar. 4 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Mar. 6 | Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| 6/7 | ----------- | **SPRING BREAK** | ------------------------------------------------------------ | ----------------------------------------- | ------------------------------------------------------------ |
| 8 | Mar. 24 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Mar. 26 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| 9 | Mar. 30 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Apr. 1 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| 10 | Apr. 7 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Apr. 9 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| 11 | Apr. 13 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Apr. 15 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| 12 | Apr. 21 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |
| Apr. 23 | * Build | * Understand general shop safety procedures * Understand how to use basic shop machinery * Continue building table | * Continue building tables | * Facilitate building of tables * Assist students individually, as needed |

**Summative Assessment**

(According to IB design assessment criteria for Year 5)

**Criterion C: Creating the solution**

Students create a solution. At the end of year 5, students should be able to:

1. Construct a logical plan, which describes the efficient use of time and resources, sufficient for peers to be able to follow to create the solution
2. Demonstrate excellent technical skills when making the solution
3. Follow the plan to create the solution, which functions as intended
4. Fully justify changes made to the chosen design and plan when making the solution

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| **Achievement**  **level** | **Level descriptor** |
| 0 | The student does not reach a standard described by any of the descriptors below. |
| 1-2 | The student:   * **demonstrates approaching** technical skills when making the solution * **presented** **in an incomplete form**. |
| 3-4 | The student:   * **lists** the main steps in a plan that contains the details to follow the plan to create the solution * **demonstrates good** technical skills when making the solution * **creates** the solution, which **partially** functions and is presented. * **states more than one change** made to the chosen design **or** plan when making the solution. |
| 5-6 | The student:   * **lists** the steps in a plan, which **considers** time and resources, resulting in peers being able to follow the plan to create the solution * **demonstrates competent** technical skills when making the solution * **creates** the solution, which functions **as intended** and is presented **appropriately** * **states one change** made to the chosen design **and** plan when making the solution. |
| 7-8 | The student:   * **outlines** a plan, which **considers** the use of resources and time, sufficient for peers to be able to follow to create the solution * **demonstrates excellent** technical skills when making the solution * follows the plan to **create** the solution, which functions as **intended** and is presented **appropriately** * **explains changes** made to the chosen design and plan when making the solution. |

**Notes for Criterion C**

* When changes have been made to the solution, students must describe and justify each change. If there are no changes to the plan, students are not required to describe or justify any changes.
* **Technical skills:** A student’s level of technical skill can be determined using the following two factors:
  + The complexity of skill demonstrated
  + The level of guidance needed from the teacher to complete the task

The teacher should determine an age-appropriate level of technical skill demonstrated by the student using a “best-fit” approach. A clarification is detailed below.

**Minimal technical skills:** Simple skills are demonstrated and the student requires a great deal of assistance after they have received initial instruction on how to use tools.

**Satisfactory technical skills:** Simple and complex skills are demonstrated and the student requires some assistance after they have received initial instruction on how to use complex tools.

**Competent technical skills:** Complex skills are demonstrated and the student generally works independently, requiring some guidance after initial instruction.

**Excellent technical skills:** A wide range of complex skills are demonstrated and the student works independently, requiring minimal guidance after initial instruction.