TWJ3E

Custom Woodworking

Designing a Nightstand

Abstract

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Project Overview

Furniture is an important part of any person's life. The function, style, purpose, and price are things to consider when either constructing or purchasing a piece of furniture. Material can also play an important role depending on grain, colour and cost. As an example, a piece of furniture constructed of an exotic material such a purple heart or Olive will cost a lot more than a piece built of pine or butternut. The skills and knowledge gained will allow students to move to a higher level and appreciation on how furniture is drawn, planned and constructed in a safe environment.

Project Challenge

You have been asked by a client to design and build a nightstand for a room in the house. Your task is to design, construct and finish a nightstand that will require one drawer and door(s) for storage of items. See **Appendix A** for assignment.

Connections

L: Literacy
ML: Mathematical Literacy

SEF Component 1
Indicator 1.1 - Assessment is connected to the curriculum, collaboratively developed by educators and used to inform next steps in learning and instruction.
Indicator 1.2 - A variety of relevant and meaningful assessment data is used
by students and educators to continuously monitor learning, to inform instruction and to determine next steps.
Indicator 1.3 - Students and educators build a common understanding of what students are learning by identifying, sharing and clarifying the learning goals and success criteria.
Indicator 1.4 - During learning, timely, ongoing, descriptive feedback about student progress is provided, based on student actions and co-constructed success criteria.
Indicator 1.6 - Assessment of learning provides relevant and meaningful evidence to evaluate the quality of student achievement at or near the end of a cycle of learning and to determine next steps.
Indicator 1.7 - Ongoing communication about learning is in place to allow students, educators and parents to monitor and support student learning.
SEF - Component 2
Indicator 2.4 Job-embedded and inquiry-based professional learning builds
capacity, informs instructional practice and contributes to a culture of learning.

	SEF - Component 3 Indicator 3.1 - The teaching and learning environment is inclusive, promotes the intellectual engagement of all students and reflects individual student strengths, needs, learning preferences and cultural perspectives. Indicator 3.2 - Students' stated priorities that reflect the diversity, needs and interests of the student population are embedded in School Improvement Plans (SIPs). Indicator 3.3 - Students are partners in dialogue and discussions to inform programs and activities in the classroom and school that represent the diversity, needs and interests of the student population. Indicator 3.4 - Students demonstrate a wide range of transferable skills, such as teamwork, advocacy, leadership and global citizenship. SEF - Component 4 Curriculum, Teaching and Learning Indicator 4.2 - A clear emphasis on high levels of achievement in literacy and numeracy is evident throughout the school. FMNI - TWJ 3E - SE - D2.2 - describe the economic and cultural effects of the custom woodworking industry (e.g., … opportunity to preserve and/or apply traditional designs) on a specific community or population (e.g.,. Aboriginal)
Project Criteria	**Examples**
• Must be no larger than 19" wide X 12" deep X 24"high and constructed from a softwood (e.g., pine, basswood, etc) • Must have completed sketches and orthographic drawings to construct. Must have a material cut list completed • Must have the nightstand constructed and prepared for final finishing • Must discuss finish options with client/teacher (e.g., stain colours, urethane types, application, etc) if applicable	See **Appendices** - built within the project in other folder

Project Synopsis and Timelines

Activity Number	Activity Title/Name	Hrs.	Curriculum Expectations	Assessment & Evaluation	Connections
1	Looking at the Fundamentals • Introduction to project • Research and documentation • Presentation and sharing	2.5	OE - A1 SE- A1.2, A1.3 OE - A2 SE A2.2, A2.3 OE - A3 SE A3.4	K/U T K/U	▪ Ontario Curriculum ▪ Growing Success ▪ DI (Differentiated Instruction) ▪ SEF (School Effectiveness Framework) ▪ STEM (STEM education (Science, Technology, Engineering and Math) is a vital piece in a student's studies and can not only drive the economy through the promotion of business innovation and increase employability opportunities. ▪ Math Literacy ▪ Literacy FNMI (Ontario First Nation, Métis, and Inuit)
2	Planning the Project - Keep the Client in Mind • Reviewing the Design Process • Reviewing research finding • Preparing orthographic drawings including dimensioning and labelling • Prepare material cut list	5	OE - B1 SE B1.1, B1.3, B1.4, B1.5 OE - B2 SE B2.2, B2.3 OE - B3 SE B3.2, B3.3 OE - B4 SE B4.1, B4.3, B4.5	K/U A T A	▪ Ontario Curriculum ▪ Growing Success ▪ DI ▪ SEF ▪ STEM ▪ Math Literacy ▪ Literacy

3	Fabrication, Assembly and Finishing ● Reviewing of Safety Passports and expectations ● Prepare and fabricate materials based on cut list ● Assemble materials using a variety of joinery and fasteners ● Sand and finish nightstand Final Steps - Delivery to the Client ● Final presentation and celebrations - evaluation	13	OE - C1 SE C1,1, C1.2, C1.3, C1.4, C1.5, C1.6, C1.7 OE - C2 SE - C2.1, C2.2, 2.3 OE - D1 SE D1.4 OE - D2 SE D2.3 OE - E1 SE E1.1, E1.4, E1.5	A A T T A	▪ Ontario Curriculum ▪ Growing Success ▪ DI ▪ SEF ▪ Literacy

CONNECTIONS RESOURCE LIST

The Ontario Curriculum, Grade 11-12, Revised 2009
http://www.edu.gov.on.ca/eng/curriculum/secondary/2009teched1112curr.pdf
Growing Success
http://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf
Differentiated Instructions
Educator's Package, 2010(DI)
http://www.edugains.ca/resourcesDI/EducatorsPackages/DIEducatorsPackage2010/2010EducatorsGuide.pdf
School EffectivenessFramework, 2013 (SEF) http://www.edu.gov.on.ca/eng/literacynumeracy/SEF2013.pdf
Think Literacy
http://www.edu.gov.on.ca/eng/studentsuccess/thinkliteracy/
Leading Math Success
http://www.edu.gov.on.ca/eng/document/reports/numeracy/numeracyreport.pdf
Ontario First Nations, Metis, and Inuit Education Policy Framework (FNMI)
http://www.edu.gov.on.ca/eng/aboriginal/fnmiFramework.pdf8
Ontario's Equity and Inclusive
Education Strategy http://www.edu.gov.on.ca/eng/policyfunding/equity.pdf
Ontario Skills Passport (OSP) http://www.skills.edu.gov.on.ca/OSP2Web/EDU/DisplayEssentialSkills.xhtml
Linking Essential Skills and the Ontario Curriculum
http://www.skillszone.ca/cesl/docs/Linking%20Essential%20Skills%20and%20the%20Ontario%20Curriculum%20-%20English.pdf
OCTE Resources SafeDocs, SafetyNet
http://www.octelab.com/

Activity 1 - Looking at the Fundamentals

Minds On (Engaging Prior Knowledge)

Activity 1 Looking at the Fundamentals

Activity Description:
Create a context for learning by explaining that students, in the role of a cabinet maker, will be researching, designing and sketching preliminary drawings for a Nightstand that was requested by a client. Students will then explain the design and material choices to a group of three peers based on preference or teacher selection. Based on the prior experience of students, decide whether students should complete the assignment individually or in pairs and decide what drawing format options may be used (e.g., CAD software, pencil).

Activity 1 Criteria and Instructions

Research: Groups of Four Numbered Heads—Ranking

- Place students in small groups in a computer lab or Chromebooks - another option is with a selection of photos, drawings, and/or sketches of various Nightstands. Encourage students to bring their own samples as well.
- Draw students' attention to the complexities (e.g., gables, joinery, routered edges, material choice, etc) of the Night Stand.
- Provide students with a copy of the Complexity Chart (**Appendix B**) for recording.
- Research, note and save digital images of different nightstands in a Shared Google Drive. When researching, be sure they find nightstand designs that meet the criteria of the assignment (**Appendix A**).

Research Sources

- Have students cite all sources on a Shared Google Doc for future reference.

Group Presentation of Findings

- Explain that students will be called upon by number to answer questions about their group decisions, so everyone in the group must be ready to respond.

Activity 1 Prior Knowledge	Connections
● Establishing a positive learning environment ● Connecting to prior learning and/or experiences ● Setting the context for learning **Students will have:** ● Completed an Internet Agreement Form **Individual and Group work Skills:** ● Research skills….ability to use a variety of resources (e.g., Internet, magazines, etc.). ● Skills in cooperative learning environment (working together) and an understanding of personal responsibilities/commitment required for group activities. ● Basic skills in word processing used for journals/log entries. ● Sketching skills ● Respect for self and others in their environment.	▪ Ontario Curriculum (OE - A1 SE- A1.2, A1.3 OE - A2 SE A2.2, A2.3) ▪ Growing Success (look at many types of evidence which will show that a student has learned the required curriculum content and skills) ▪ SEF Component 1 Assessment for, as and of Learning ▪ Indicator 1.1 - Multiple and varied opportunities are provided for students to demonstrate, communicate and refine their learning.) ▪ STEM (Science, Technology, Engineering and Math) is a vital piece in a student's studies and can not only drive the economy through the promotion of business innovation and increase employability opportunities. ▪ Math Literacy - students have a basic understanding of coordinate systems, Cartesian Plane, metric vs imperial units, fractions, etc ▪ Literacy - students are able to present their design through graphic communications using sketching techniques and computer aided design (CAD) ▪ FNMI (foster school-community projects with appropriate cultural components - look at adding a component such as a replica of a wood carving - can incorporate a CNC if available to embed on drawer front)

Activity 1 Planning Notes	Connections
• Check that students understand the terminology and note terms on chart paper for student reference (i.e., Word Wall). • Check recommended resources prior to beginning the activity. • Ensure that all computers or Chromebooks are in working order and that Internet access is available. Check school WiFi for accessibility. • Prepare resources (handouts, sample drawings, images, etc)) necessary for the delivery activity.. Prepare collaboration software (e.g., Google Drive/Folders, Docs, etc), and that all posts are updated and ready for student interaction. • Review learning goals and success criteria so that they can be identified, shared and clarified with students and parents. **Note:** It is recommended that all resources be posted to your Wiki/website (either school or board based) to avoid too many handouts and to ensure full accessibility.	▪ Ontario Curriculum (OE - A3 SE A3.4) ▪ Growing Success (Fundamental Principles - carefully planned to relate to the curriculum expectations and learning goals and, as much as possible, to the interests, learning styles and preferences, needs, and experiences of all students;) ▪ DI (diagnostic assessment- provides teachers with information about students' readiness to learn new knowledge and skills, and about their interests and attitudes)

Action (Introduce or Extend Learning)

Activity 1 Instructional Strategies	Connections
Teacher: • Form small groups and number off 1 through 3 in each group • Have students assign a scribe per group to record the research. • Provide passwords, Computer Lab or Chromebooks for research. • Provide students with the Complexity Chart (**Appendix B**) to students (one per group).	▪ Ontario Curriculum (OE - A3 SE A3.4) ▪ Growing Success (Collaboration - students accept various roles and an equitable share of work in a group); ▪ DI (establish the starting point for the new learning, and helps teachers to plan differentiated tasks and assessments that meet students' learning needs, interests and learning preferences.

• Ensure that all students in their group can respond if called upon to explain the rankings. • Consolidate the activity with a whole class discussion, noting the depth of understanding students demonstrate in their response. • Indicate that students will be able to choose the level of complexity for their Nightstand. **Students:** • Assign a scribe and research various nightstands through Google • Take turns speaking as they discuss each one of their findings in terms of design considerations such as scale, drawer depth, number of shelves, depth of shelves based on what they are designing for, safety in material selection, tools required, etc. • Rank each nightstand from simplest to most complex and provide a reason for the ranking (**Appendix B**) • Discuss with whole class their research findings.	▪ DI (provide an open-end approach when having students select a product. Have students choose their own product. A choice board with examples may help. The recommended material is noted as softwood wood, but some students may wish to use hardwood (e.g., oak, maple, etc).)
Activity 1 Assessment and Evaluation	Connections
Ensure students are on task and are sharing ideas **Knowledge and Understanding**: Ensure students are researching the proper content and have a solid understanding of the requirements for the nightstand. **Thinking:** Ensure students are interpreting information on the complexities of various nightstands; the research meet the minimum requirements based on the assignment (e.g., size, drawer, door, etc) and form conclusions. **Communication**: Students will convey of meaning through various forms such as oral, discussion or presentation. **Application:** Students will make connections between what is required and the complexities that can arise in researching other nightstands.	▪ AfL - share learning goals and success criteria with students at the outset of learning to ensure that students and teachers have a common and shared understanding of these goals and criteria as learning progresses; ▪ Growing Success (page 13 B. Interacting in Heterogeneous Groups * The ability to relate well to others * The ability to cooperate and work in teams) ▪ Ontario Skills Passport - Reading, Oral Communication, ▪ Learning Skills - Responsibility, Organization, Initiative
Activity 1 Accommodations	Connections

Teachers are to be familiar with exceptional students' Individual Education Plans (IEPs) for legislated accommodations, and consult with the appropriate staff. By doing this, teachers will be aware of and can implement prescribed modifications accommodations and/or alternative program goals. Students can be assigned to support each other (e.g., Learning Styles, IEP's, complexity, etc) such as: ● Grouping design teams with varied abilities to allow for peer support. The teacher may choose or modify the teams depending on individual strengths and weaknesses. ● Providing a list of resources/websites that will assist with their findings. ● Specific research materials. ● Pairing experienced students with those who are not yet familiar with the techniques. ● When available, use of a support staff to assist students in reaching their IEP goals.	▪ Ontario Curriculum ▪ Growing Success ▪ DI (page 28 - use assessment to inform instruction, guide next steps, and help students monitor their progress towards achieving their learning goals)

Consolidation & Connections (Provide Opportunities for Reflection)

Activity 1 Complexity Chart/Exit Card	Connections
• Once students have completed the Complexity Chart (**Appendix B**) collect and review notes to determine feedback from groups. • Have a students complete the Self Assessment Exit Card and collect for review (**Appendix C**)	▪ DI (Assessment for Learning is the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they need to go and how best to get there) ▪ Growing Success (page 29 - analyse and interpret evidence of learning; give and receive specific and timely descriptive feedback about student learning; help students to develop skills of peer and self-assessment.)

Materials, Equipment, Tools and Resources

Activity 1 Websites
Examples of Nightstand Images https://www.google.ca/search?q=nightstands&biw=1517&bih=714&source=lnms&tbm=isch&sa=X&sqi=2&pjf=1&ved=0ahUKEwj4q-a5mfrNAhULcj4KHef7D6MQ_AUIBigB&dpr=0.9 **Woodworking Joinery** https://en.wikipedia.org/wiki/Woodworking_joints **Canadian Woodworking Magazine** https://www.canadianwoodworking.com/
Activity 1 Publications
• Custom Woodworking Magazines
Activity 1 Computer Software

- Computer Lab
- ChromeBooks
- Internet activity

Activity 1 Human Resources

- Guest Speakers:(e.g., Cabinet Makers, College students, First Nations, Metis, Inuit guest speakers
- Special Education/Resource staff
- English Department Staff
- Math Department Staff
- Local community

Activity 1 Other

- Board computer policies
- Paper, pencils

Activity 1 Appendices

Appendix A - Appendix Title – NIGHTSTAND PROJECT- ASSIGNMENT
Appendix B - Appendix Title – COMPLEXITY CHART NIGHTSTAND PROJECT
Appendix C **-** Appendix Title – NIGHTSTAND PROJECT - SELF ASSESSMENT EXIT CARD

Activity 2 - Planning the Project - Keep the Client in Mind

Minds On (Engaging Prior Knowledge)

Activity 2 Planning the Project - Keep the Client in Mind

Activity Description:
Students as cabinetmakers will use the information they researched and sketched to design and produce scaled orthographic drawings of their Nightstand which will be reviewed by the client. Students will also produce a material cut list for the nightstand and plan for the building phase. Students will have alternative choices on producing the orthographic drawings e.g., CAD, pencil, etc) as well selecting the levels of complexity (e.g., joinery, finished edges, gable support design, etc).

Activity 2 Criteria and Instructions

Production of Orthographic Drawings:

- Place students individually or in small groups in a computer lab or Chromebooks with CAD or drafting boards, T-square, set squares-
- Draw students' attention to the complexities (e.g., gables, joinery, routered edges) of the Night Stand.
- Have students think about adding additional features such as a CNC image if available (e.g., sports logo, aboriginal carving, family image, etc)
- Provide students with a copy of the Complexity Chart (**Appendix B**) for recording.
- Use research notes and save digital images from Activity 1 of different nightstands in a Shared Google Drive. Ensure the research they found on nightstand designs meet the criteria of the assignment (**Appendix A**).

Research Sources

- Have students cite all sources on a Shared Google Doc for future reference.

Group Presentation of Findings

Explain that students will be called upon by number to answer questions about their group decisions, so everyone in the group must be ready to respond. Explain that the students will be logging their activities for each step of the design process (**Appendix E**). Stress that the process is not linear and that they will often go back to an earlier step in the log to add more details. Discuss the consequences of not being thorough and or accurate at each step (e.g., safety, clarity, waste, etc). Distribute file folders and encourage students to set up a "client folder" for all sketches, drawings and material cut lists.

Activity 2 Prior Knowledge	Connections
Working skills; The student will have: ● skills in cooperative learning environment (interpersonal skills) and an understanding of personal responsibilities and commitment required for individual or group activities. ● basic skills in word processing used for journals/log entries (**Appendix E**). ● respect for the rights, responsibilities and contributions of self and others. ● experience from previous Grade 11 Custom Woodworking activities. ● experience and knowledge of basic sketching and drawing standards. ● an understanding of computer aided design(CAD) and drafting as they relate to orthographic drawings. ● mathematical skills relevant to drawing accuracy, measurement units. ● understand components and terminology for Nightstand (**Appendix F**) - prior knowledge review. ● knowledge of materials (e.g., wood types, fasteners, etc).	▪ Ontario Curriculum - ▪ OE - B1 SE B1.1, B1.3, B1.4, B1.5 ▪ OE - B2 SE B2.2, B2.3 ▪ OE - B3 SE B3.2, B3.3 ▪ OE - B4 SE B4.1, B4.3, B4.5 ▪ SEF Component 4 Curriculum Teaching and Learning Indicator 4.2-Numeracy specific concepts are explicitly used to deepen student learning and understanding in all subjects. ▪ DI (Allow students choices on completing orthographic drawings) **Teacher Tip:** A great way to discuss Cartesian coordinate system as well a triangulation. ▪ OCTE Safety Resources

Activity 2 Planning Notes	Connections
Prior to beginning this activity: ● ensure that all computers or Chromebooks are in working order and that the CAD software is functional. ● Ensure there is mechanical equipment for manual drafting (e.g., table tops, T-squares, set squares, scales, pencils, etc) ● Review all activities and prepare all resources (handouts, tools, and materials) necessary for the delivery of content. ● Review the Fundamental Concepts (page 7 of the Curriculum Document) ● Review steps of the Design Process (page 22 of the Curriculum Document) as well as on **Appendix D**. ● Have student folders with their research information in a file folder for easy access. ● Review students Complexity Chart (**Appendix B**) and Exit Card (**Appendix C**) to ensure they can meet the timelines required based on past experiences. ● Create and/or gather teaching aids to act as visual aids when introducing orthographic views. A variety of simple objects such as wooden blocks cut in geometric shapes can also help. Solicit help from the Technological Design teacher(s) and/or students to create these visual aids. Demonstration of drawing techniques can be very helpful. A whiteboard, projection system or even a YouTube video can be used. Note: When reviewing sketching techniques, teachers should demonstrate the techniques in progression starting from the beginning and working through the steps to the final drawing. ● Review Material Cut List Sheet (**Appendix H**)	▪ Ontario Curriculum - To address technological challenges and solve problems effectively, students need to take the full range of these concepts and elements of technology into account. ▪ Growing Success ▪ SEF - Component 3.0 ▪ Indicator - 3.1 - The teaching and learning environment is inclusive, promotes the intellectual engagement of all students and reflects individual student strengths, needs, learning preferences and cultural perspectives. ▪ Indicator 3.4 - Students demonstrate a wide range of transferable skills, such as teamwork, advocacy, leadership and global citizenship. ▪ STEM ▪ Math Literacy - Making mathematics meaningful is a key priority for engaging adolescent learners. By applying mathematics in ways that are linked to students' experiences, curiosity, imagination, and aspirations. Learning must begin with where students are and what they know ▪ Think Literacy - Oral Communications-Whole Class Discussion-Discussion Etiquette Small group discussion strategies can apply here. ▪ FMNI - indigenous perspectives extend and enrich the educational experience, provide intercultural knowledge and experiences and afford opportunities to explore and appreciate Aboriginal socio-cultural, economic and ecological contributions to Canadian society **Teacher Tips** It is recommended where possible that all resources be posted to your board collaboration system or on a teacher WIKI/Website to avoid too many handouts and to ensure full accessibility.

	Collaborate with Construction Technology teachers within your school board or province to establish best practices and curriculum improvements. Become a member of the Ontario Council for Technology (OCTE) where tech teachers can network and collaborate on common challenges and resource development.

Action (Introduce or Extend Learning)

Activity 2 Instructional Strategies	Connections
Teacher: ● Distribute and review the assessment criteria for the Design Process Log (**Appendix E**), for the Nightstand. ● Distribute and review the Nightstand Components so terminology is consistent for all students (**Appendix F**). ● Provide students with Checklist (**Appendix G**) and Nightstand Rubric (**Appendix I**) so they can plan accordingly. ● Refine both the checklist and rubric based on student input. **Material Selection** ● Discuss different types of materials (softwood, hardwood, masonite, etc) that are available for the Nightstand. ● Describe how to select materials based on design criteria, costs, and environmental consideration (maximum use of material, recycle material, etc).. **Joining Methods** ● Review and discuss fasteners (e.g., screws and types of threads, glue, etc), joinery (e.g., rabbet, dado, biscuit, pocket hole, etc), finished edges (roman ogee, corner round, bead and cove, etc,), gable support design, etc for the nightstand.	▪ DI - It is crucial that the goals and criteria be shared with students at the outset of instruction, and referenced during instruction. When sharing the learning goals with students, state them from a student's perspective (e.g., "I can…, I will be able to…, We are learning to…") ▪ Leading Math Success: Mathematical literacy includes the ability to put mathematical knowledge and skills to functional use rather than just mastering them within a school curriculum. Ontario Skills Passport Numeracy skills in measurement and calculations.

• Have students select materials and joining methods for their nightstand. **Orthographic Drawings** • Review the three views and layout of orthographic drawings. • Have students incorporate the joinery, fasteners, and edging within the drawings. Emphasis that planning and having a good set of drawings will save time during the assembly and finishing phase. • Have students select how they want to prepare their drawings (e.g., pencil, CAD, etc) **Students:** • Review research information and begin to design and plan the nightstand. • Prepare orthographic drawings using either pencil or CAD for the night stand. They can use the drawing provided (**Appendix F**) as an example for components. • Prepare a material cut list including the amount of board feet required for the project. (**Appendix H**) • Review the Checklist and Nightstand Rubric to ensure that all components have been covered prior to constructing.	
Activity 2 Assessment and Evaluation	Connections
Feedback - Assessment during instruction (formative assessment) is intended to give teacher and students precise and timely information so the teacher can adjust instruction in response to individual student needs, and students can adjust their learning strategies or set different goals. **Knowledge and Understanding:** Ensure students are using the Design Process and their research information to prepare a scaled orthographic drawings for their nightstand. Students	▪ AaL - use to determine what students already know and can do with respect to the knowledge and skills identified in the overall and specific expectations, so teachers can plan instruction and assessment that are differentiated and personalized and work with students to set appropriate learning goals. ▪ Think Literacy - Developing and organizing ideas - understanding how to track project progress using tracking tools as recommended

will rely on prior knowledge of drawings from previous projects. **Thinking:** Ensure that students have used interpreted the information from their research and are including the details in their orthographic drawings including any complexities that may arise. Students will also prepare a material cut list based on their drawings. **Communication:** Students will prepare orthographic drawings through the Design Process and a variety of forms (AutoCAD, Sketchup, Mechanical, etc) to convey their nightstand. Students will also dimension and label the components within the drawings. **Application:** Students will use the knowledge and skills develop a formal orthographic drawing as well a material cut list for their nightstand. **Learning Skills:** Through observation and conferencing, students can be assessed formally or informally. Checklists, anecdotal comments or the Learning Skills rubric(**Appendix J**) will serve to help assess students. The teacher can document the following: - the student's skills as they relate to the Ontario Skills Passport (e.g., Essential Skills, Numeracy, Thinking Skills, etc) and encourage students to work effectively as an independent or team member. - student's initiative, time management, on task, etc. Conferencing assessment can take place on a daily basis. Be sure to provide encouragement and praising effort, as tasks are complete building on a positive self-image.	
Activity 2 Accommodations	Connections
Review student IEP's to ensure that any additional supports	▪ Ontario Curriculum - page 35 - Classroom teachers are the key

are provided. Teachers working with students who have special education needs (IEP's) use assessment and evaluation strategies to: • specify and verify the student's needs - review complexity chart to ensure student success.; • instructional planning, and determining next steps; • help determine particular interventions that may be necessary to enable the student to demonstrate achievement. • pairing experienced students with those who are not yet familiar with the techniques. Some students have obtained knowledge of drawing techniques in previous art and/or technology courses;. • the use of a support staff to assist students in reaching their IEP goals.	educators of students who have special education needs. They have a responsibility to help all students learn, and they work collaboratively with special education resource teachers, where appropriate, to achieve this goal. ▪ Growing Success - Students with Special Education Needs: Modifications, Accommodations, and Alternative Programs

Consolidation & Connections (Provide Opportunities for Reflection)

Activity 2 Design Process/Choice	Connections
• Remind students that they have practiced developing design briefs, described ways that the elements/components can be put together and reviewed through the design process (**Appendix C**). • Students will use their prior knowledge and skills to develop the proposal for the nightstand for a product of a type of drawing based on their choice and a material cut list.	DI - Interest SEF Component 2 Classroom Leadership Connections Indicator 2.2- input, through the reflection papers will help refine instruction to improve student learning * This can be achieved by discussing prior projects on an individual bases.

Materials, Equipment, Tools and Resources

Activity 2 Websites

Drawer-Building Basics - Wood Choices and Joinery Options
http://www.finewoodworking.com/pdf/drawerbuildingbasics.pdf

Activity 2 Publications

Custom woodworking Magazine

Activity 2 Computer Software

- AutoCAD
- Sketchup

Activity 2 Human Resources

- Guest Cabinet Makers for feedback
- Links to local college - liaise

Activity 2 Other

- Drafting boards
- T-Squares
- Set Squares
- Pencils

Activity 2 Appendices

Appendix B - Appendix Title – COMPLEXITY CHART NIGHTSTAND PROJECT
Appendix C - Appendix Title – NIGHTSTAND PROJECT - SELF ASSESSMENT EXIT CARD
Appendix D - Appendix Title – STEPS IN THE DESIGN PROCESS – NIGHTSTAND PROJECT (TEACHER REFERENCE)
Appendix E - Appendix Title: DESIGN PROCESS LOG

Appendix F - Appendix Title: NIGHTSTAND COMPONENTS
Appendix G - Appendix Title: NIGHTSTAND CHECKLIST
Appendix H - Appendix Title: NIGHTSTAND MATERIAL CUT LIST
Appendix J - Appendix Title: LEARNING SKILLS ASSESSMENT RUBRIC

Activity 3 - Fabrication, Assembly and Finishing - Final Steps - Delivery to the Client

Minds On (Engaging Prior Knowledge)

Activity 3 - Fabrication, Assembly and Finishing, Final Steps - Delivery to the Client
Activity Description: Upon approval from the client that the nightstand meets all criteria put forward, the project can be constructed. The cabinet maker will need to keep in mind quality and accuracy as s/he moves forward in the fabrication, assembly and finishing of the nightstand.

Activity 3 Criteria and Instructions
Explain to students they need to refer to their "client folder" to refer to all sketches, drawings and material cut lists and follow the design process while they are safely fabricating and assembling their nightstand. Discuss and remind students of the consequences of not being thorough and or accurate at each step (e.g., safety, clarity, waste, etc).

Activity 3 Prior Knowledge	Connections
• Passports to Safety for all tools have been completed • Selecting and dressing materials • Location of equipment, tools and materials • Location of fasteners • Location of folders	▪ Ontario Curriculum ▪ OE - C1 SE C1,1, C1.2, C1.3, C1.4, C1.5, C1.6, C1.7 OE - C2 SE - C2.1, C2.2, 2.3 OE - D1 SE D1.4 OE - D2 SE D2.3

	OE - E1 SE E1.1, E1.4, E1.5 ▪ Before using any piece of equipment or any tool, students must be able to demonstrate knowledge of how the equipment or tool works and of the procedures they must follow to ensure its safe use. Personal protective gear must be worn as required. ▪ Growing Success - Ensuring multiple opportunities for students to demonstrate the full range of their learning by having practiced key skill development, and have received clear, specific and timely feedback to improve student learning ▪ OCTE Resources: SafeDocs, SafetyNet, Emphasis Courses Available resource documents: safety, machine operations, lesson plans
Activity 3 Planning Notes	Connections
● Check student “client folders” to ensure all information is complete. ● Check that all students have completed their Safety Passports (e.g., in case a student was transferred into your class at a later date, international student on an exchange, etc). ● Ensure all materials required for the nightstands are available. ● Ensure all tools are working properly and blades are sharp.	▪ OCTE Resources: SafeDocs, SafetyNet, Emphasis Courses Available resource documents: safety, machine operations, lesson plans

Action (Introduce or Extend Learning)

Activity 3 Instructional Strategies	Connections
Teacher: ● Use the Nightstand Unit Checklist (**Appendix G**) to peer-assess each other's plans and make suggestions for improvement ● Check student folders to ensure they are complete. ● Check to ensure that all students have completed their Safety Passports and all records are up to date. ● Make sure there is a variety of materials ready for the student projects. If there is recycle material, ensure that it is safe and does not have nails or staples as well as has low or no toxicity. ● Ensure that all tools are sharp and ready for use (e.g., dado blades, router bits, saw blades, etc). ● Ensure the floor is clean with no obstructions or hazards. Students: ● Adjust drawings and materials cut list as appropriate based on feedback ● Observe and listen to the discussions of students. ● Use the orthographic drawings and material cut list to fabricate and assemble the nightstand ● Ensure tools are safe to use and there are no trip hazards or any other hazards in the work area. ● Follow the steps used to in the development of your Safety Passport to safely use the tools and materials to fabricate and assemble the nightstand. ● Work independently and collaboratively with peers every day. ● Create a positive environment to ensure a happy workplace.	▪ Ontario Curriculum - Students have many responsibilities with regard to their learning. Students who make the effort required to succeed in school and who are able to apply themselves will soon discover that there is a direct relationship between this effort and their achievement, and will therefore be more motivated to work. ▪ SEF - Indicator 3.3 - Students are partners in dialogue and discussions to inform programs and activities in the classroom and school that represent the diversity, needs and interests of the student population. ▪ Teacher Tip If you have access to strong students, and/or a senior student, have them mentor during the shop time to support students who may be less comfortable on machinery

Activity 3 Assessment and Evaluation	Connections
• Collect and assess the Nightstand Unit Design Process Log (**Appendix E**) and use the Nightstand Unit Rubric (**Appendix H**) to evaluate final product. • Review Learning Skills Assessment Rubric(**Appendix I**) as a tool to complete the fields on report cards.	▪ AoL - is used to summarize learning at a given point in time. This summary is used to make judgements about the quality of student learning on the basis of established criteria, to assign a value to represent that quality, and to support the communication of information about achievement to students themselves, parents, teachers, and others. ▪ Linking Essential Skills and the Ontario Curriculum
Activity 3 Accommodations	**Connections**
Optional > The teacher can also mention that there will be some additional time for students to work on their projects either before or after school. (e.g., student with an IEP, missed a week being sick, etc)..	▪ Growing Success - help determine particular interventions that may be necessary to enable the student to demonstrate achievement.

Consolidation & Connections (Provide Opportunities for Reflection)

Activity 3 Final Product Presentation	Connections
Present their Nightstand Unit plans and final product in small groups of peers using the communication method of their choice (e.g., verbally, PPT, etc), Presentation can consist of the challenge, the design process, what they liked, what would they change and some challenges along the way.	▪ DI -Feedback describes student performance. Its purpose is to reduce the gap between the student's current level of understanding and/or performance and a desired goal. Depending on the nature and delivery of the feedback, it can have powerful effects on student engagement and learning.

Materials, Equipment, Tools and Resources

Materials, Equipment, Tools and Resources
Materials: Softwood or other options, fasteners, glue, etc **Tools:** Major floor tools (e.g., thickness planer, jointer, table saw, router and table, Compound Mitre saw, etc) - Hand tools - power and non-power - (e.g., palm sanders, router, rubber mallet, chisels, pocket hole jig, biscuit jointer, etc) **Resources:** Folder location, material storage area, 'pencils, etc
Activity 3 Websites
• Google.ca • Prezi.com • OCTE - SafeDOCS, Emphasis Courses, SafetyNET, ToolSAFE Resources
Activity 3 Publications
• Canadian Woodworking
Activity 3 Computer Software
• Computer Lab with Presentation software (e.g., PPT, Prezi, Google Slides, etc) • Camera • Colour Printer
Activity 3 Human Resources
• Parents • Teachers • Student body • Local college students and teachers

Activity 3 Appendices
Appendix E - Appendix Title: DESIGN PROCESS LOG **Appendix G - Appendix Title: NIGHTSTAND CHECKLIST** **Appendix H - Appendix Title: NIGHTSTAND MATERIAL CUT LIST** **Appendix I - Appendix Title: NIGHTSTAND EVALUATION RUBRIC**