Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Technical Education	Course:	Design and Manufacturing	Unit Title:	Materials - Materials Processing	Grade Level(s):	8
Assessed Trimester:		Pacing:		Date Created:	2/28/2013	Last Revision Date:	6/27/2013

Course Understandings: *Students will understand that:*

- A technologically literate person understands the significance of technology in everyday life
- Inventions and innovations from various times in history effect technological development in society and history
- Learning about design and manufacturing technologies will introduce students to career opportunities
- Manufacturing requires safe and responsible use of technology
- That the attributes of design are necessary components to the development of a product
- Scientific and mathematical concepts increase an individuals technological literacy

DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals

Standard and Benchmark Mastery

- **Standard STL #8** Students will develop an understanding of the attributes of design
- **Standard STL #11** Students will develop abilities to apply the design process
- **Standard STL #12** Students will develop the abilities to use and maintain technological products and systems
- **Standard STL #19** Students will develop an understanding of and be able to select and use manufacturing technologies

- **High Priority** – Students must know:
  - **11-H** Students will understand that the design process is used to solve problems
  - **11-I** Students will understand that the design has specific criteria and constraints
  - **12-I** Students will understand that tools, materials, and machines are to be used safely
  - **19-F** Students will understand that manufacturing systems and processes change the form of materials
  - **19-G** Students will understand that manufactured goods may be classified as durable and non-durable
  - **19-H** Students will understand that manufacturing will include the designing, developing, and producing products and systems.

- **Medium Priority** – Students should know:
  - **8-F** Students will understand that there is no perfect design
  - **11-J** Students will understand that a model, sketch, or drawing are representations of the designed solution
  - **12-H** Students will understand that information is provided in manuals or experienced individuals to understand how things work
  - **19- H** Students will understand that manufacturing will include the designing, developing, and producing products and systems
  - **19-G** Students will understand that manufactured goods may be classified as durable and non-durable

- **Low Priority** – It is nice for students to know:
  - **8-E** Students will understand that creative planning leads to useful products and systems
  - **8-G** Students will understand that requirements for design are made up of criteria and constraints
  - **11-L** Students will understand that documentation of the solution is needed in order to make a product or system
  - **11-K** Students will understand that tests and evaluations improve the design solution
  - **12-J** Students will understand that computers and calculators are used in numerous applications

Transfer

Students will be able to independently use their learning to: (product, high order reasoning)

- **12-M** Apply information to project construction
- **12-M** Utilizing different materials to construct a project
- **19-P** Students will be able to create a product using manufacturing processes
- **19-P** Students will be able to produce a product or system through design, developing and manufacturing
- **12-P** Produce a project using hand tools and machines
- **D** To be able to make computations for a bill of materials through the use of a computer or calculator

Meaning

Unit Understanding(s):

Students will understand that:

- There is an order of operations
- There is a correct material of each project
- Material for projects can vary from project to project or design to design
- There are different processes involved in producing material
- That varying designs require different materials to produce

Essential Question(s):

Students will keep considering:

- I can calculate material needed for project.
- I can determine types of material.
- I can use tools to modify materials.
- I can follow the working plans
- I can safely handle materials
- I can select proper materials for my project
- I can choose and explain different processes
- I can build a quality product design

Acquisition

Knowledge - Students will:

- **8-M** Understand written and verbal instructions /constraint
- **11-M** Recognize that designs need to be tested and evaluated
- **12-M** Understand information obtained from manuals or experienced people
- **12-M** Understand tools machines and materials
- **19-P** Understand that manufacturing systems and processes change the form of materials
- **19-M** Understand that manufactured goods may be classified as durable and non-durable
- **19-M** Understand that manufacturing will include design, developing and producing products and systems

Reasoning - Students will:

- **11-M** Mentally layout for most efficient use of materials
- **11-M** Apply design measurements to the appropriate material
- **12-M** Interpret information required from manuals and experienced people
- **12-M** Understand how tools and machines operate
- **19-P** Organize manufacturing through design, developing and producing products and systems
- **19-P** Organize goods as durable and nondurable
- **19-P** Evaluate manufacturing systems and processes
- **19-M** Organize manufacturing through design, developing and producing products and systems

Skills - Students will:

- **11-M** Accurately layout materials
- **12-M** Utilize information read from manuals
- **12-M** To be able to apply different materials in project construction
- **12-M** To be able to carry out computations through the use of computer or calculator.
- **19-M** Students will be able to carry out manufacturing through designing, developing and producing products and systems
- **19-P** Students will be able to carry out manufacturing through designing, developing and producing products and systems
- **19-P** Students will be able to explore goods as durable and nondurable

Common Misunderstandings	Essential new vocabulary

• Any material will work for any job • Not measuring accurately • Not preassembling • Order of operations is not important	• Board feet • Gauge • Thickness • Width • Length • Edge/End/Surface • Grain • Hem/Tab/Seam • Fasteners ie. glue, screws, spot weld • Wood species • Metal types • Manufacturing processes • Routing • Crosscut • Rip • Metal types • Bending