7th Grade
Building Trades Exploratory
2019-2020
By: Brian Jorgensen

Unit: *!!!!Safety!!!!!*	**Time:** *1st one to two weeks of class*

Standards Taught

This is a one quarter to one semester class (depending on the size of the incoming 7th grade class**) that is designed to the generate interest of the seventh grade student for pursuing further classes in the Manufacturing and Building Trades career paths. The scheduling for Drivers Education Will determine the length of this class.**

IAC = Introduction to Architecture and Construction
IDD = Introduction to Drafting and Design
MSMR = Middle School Mechatronics/Robotics
ITE = Introduction to Technology Education

IAC 2.1 Apply general shop safety principles.
IAC 2.2 Apply job site and career safety concepts.
IAC 2.4 Apply general hand and power tool safety procedures.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. The shop is set up much as the student will experience in a wood or manufacturing environment.*	• *Read Chapters 3 – 8 in Modern Woodworking* and answer study questions at the end of the chapter and in the workbook. (Pages 45-122) • *Studying and demonstrating how to use, and maintain the hand tools, and all of the power tools that are located in the school shop or any tool*

		that may be brought into the shop. • *Research the history of OSHA and how it effects employers, and workers in the construction industry.* • *List OSHA rules and regulations that affect the workers in the three career opportunities that they created the pamphlets for in the previous unit.* • *Research and give an oral report on a school shop accident that has happened recently in the United States and complete the following:* - What happened? - Who got hurt? - What went wrong? - Who was responsible? - Were there any OSHA violations involved? - What medical attention was required? - Was there any legal action taken? - How could of this accident been prevented? • Fill out an accident report
Prior Knowledge Needed	**Vocabulary**	**Assessments**

There is no prior knowledge needed for this class.	• Accident • Safety • Maintenance • First aid • Accident procedure • Accident report	• Completed personality profile • Completed reality check worksheet • Employer lists • Weekly journal checks
Relevance: There are a lot of opportunities to get sick or injured on the job. The purpose of this unit is to demonstrate that personal safety is ultimately the responsibility of the individual on the job. If a person gets hurt on the job they should also know how to navigate the rules and regulations that come into effect at that point.	***Examples:*** • Hand tool safety • Power tool safety • General shop safety	**Materials Needed:** • Computer. • Internet • Text Modern Woodworking • Miscellaneous office supplies
Reflection: It is important to maintain a balance when teaching this unit. It is important to hammer home the importance the lifelong consequences of unsafe work habits, but care needs to be taken to make sure that you don't scare the students so that they never want to pick up and use a tool.	**Essential Questions:** • What are the ways that this tool can hurt me? • Do I know how to use this tool properly? • Am I aware of what is going on around me? • Are the people that I am working next to doing something that could injure me? • Am I doing something that could injure people that are working next to me?	

Unit: *Writing Wednesday's*	**Time:** *Every Wednesday after safety unit.*

Standards Taught

ITE 1.1 Examine the relationship technology and other areas of study.
ITE 2.1 Understand the effects of technology on the natural environment.

IM 4.1 Identify and display professional practices in the workplace.
IM 6.1 Research and understand basic concepts of the manufacturing career.
IM 7.1 Develop a prototype of a product.

MSMR 2.1 Compare and contrast robotics labor vs. human labor.
MSMR 2.3 Explore new entrepreneurial opportunities using robotics.

ENT 1.3 Compare entrepreneurial spirit, innovation, and creativity.
ENT 1.2 Demonstrate an understanding of entrepreneur characteristics.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. The shop is set up much as the student will experience in a wood or manufacturing environment.*	• *ITE 1.1 – How has the use of technology changed the world that we live in from the days that your parents were your age until now? Comparing the following areas of everyday life:* - School work - Manufacturing - Banking - Entertainment - Communications - Ordering a pizza • *ITE 2.1 Answer the following questions.* 1. Do computers, cell phones contain components that

		can harm the environment if so what are they? 2. How has digital technology helped the environment? 3. What is the proper method of disposing unwanted electronic products? • *IM 4.1 Answer the following questions.* *1. If you owned a business and had people working for you what qualities would you look for in a new hire and how would you expect them to act on the job?* *2. If one of your employees was not working up to your standards what actions would you take and why?* • *IM 6.1 Calculate the following for the lamps that you made:* - *Materials cost* - *Labor cost* - *Price point* - *Profit* - *Waste expense* - *Now calculate the cost them for 10,000 produced per year.* • IM 7.1 Make a paper airplane (you can use the internet to build one

		then you must shut it down). - Once the airplane is completed write a complete set of step by step instructions so that you could give them to someone else, and they would be able to replicate what you did. - Give those instructions to one of your parents or grandparents and have them use it to recreate your air plane. You must not help them at this point. - Take a photo of both planes side by side and turn in everything. • MSMR 2.1 Why have businesses replaced human workers with robotic ones, and what advantages do each have over the other? • MSMR 2.3 If you could build any robot that you can imagine what would it do and how could you make a living with it? • ENT 1.3 What is meant by the term entrepreneurial spirit and how has this shaped the country that we live in?

		• ENT 2.1 When thinking about yourself describe what characteristics make up your personality. You will need to identify at least 8 things both "good and bad" and explain why you label them that way.
Prior Knowledge Needed	**Vocabulary**	**Assessments**
There is no prior knowledge needed for this class.	With this age group it is important to make them feel comfortable asking questions and clarify vocabulary terms as the questions arise.	• Comprehensive writing examples • Participation in class discussions and willingness to share and offer examples.
Relevance: This lesson serves several functions including: • Getting students thinking about their careers • Encourages them to make connections from academics to real life situations. • Examine different career pathways	***Examples:***	**Materials Needed:** • Computer. • Internet • Miscellaneous office supplies • A healthy imagination

Unit: *Horse Trough Lamp*	**Time:** *Second through Fifth week of class*

Standards Taught

IDD 4.2 Create isometric and pictorial drawings.
IAC 2.1 Apply General Shop safety principles.
IAC 2.4 Apply general hand and power tool safety procedures.
IAC 3.1 Demonstrate proper use of appropriate math skills.
IAC 3.2 Demonstrate proper measuring and layout skills.
IAC 4.2 Recognize proper application of fasteners, adhesives, and hardware.
IAC 6.1 Apply proper measuring and cutting techniques to perform job related tasks.
IAC 6.2 Display a working knowledge of tools and equipment used in the industry.
IAC 6.3 Construct a project using the assigned design process.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. The shop is set up much as the student will experience in a wood or manufacturing environment.*	• After a class discussion draw the model of the lamp in the classroom, measure everything, and create a list of parts that will be needed to make that lamp. • Measure and lay out the pieces that are needed to construct the lamp that will replicate the model located in the classroom. • Critique the safety procedures that the teacher uses when using the power tools to cut out the pieces for your lamp.

		• Demonstrate the proper use of hand tools in the construction of your lamp. • Wire the lamp so that it meets electrical CODE standards, secure the instructors approval, and test the lamp. • Apply an approved finish to the lamp and take it home.
Prior Knowledge Needed	**Vocabulary**	**Assessments**
There is no prior knowledge needed for this class.	With this age group it is important to make them feel comfortable asking questions and clarify vocabulary terms as the questions arise.	• Participation in class discussions and willingness to share and offer examples. • Completed project
Relevance: This lesson is designed to broaden the student's horizons and to stimulate an interest in trying new things.	***Examples:***	**Materials Needed:** • Lumber • Light bulb • Pull chain lamp socket • Electrical cord • Electrical plug in • Hand tools • Fasteners • Glue • Power tools

Reflection:	**Essential Questions:**
This has been a very popular activity for the students. I really want them thinking about safety and to be willing to call me out if they see something that they think is an unsafe practice. This will stimulate a discussion that need to take place instantly to make them lifelong lessons.	• Can I do this? • Am I concerned about anything that I will be doing? • Do I feel that I can bring my concerns into the open so that we can talk about them? • Have I build anything before this?

Unit: *Whistle and Top Time*	**Time:** *Sixth week of class*

Standards Taught

IDD 4.2 Create isometric and pictorial drawings.
IAC 2.1 Apply General Shop safety principles.
IAC 2.4 Apply general hand and power tool safety procedures.
IAC 3.1 Demonstrate proper use of appropriate math skills.
IAC 3.2 Demonstrate proper measuring and layout skills.
IAC 4.2 Recognize proper application of fasteners, adhesives, and hardware.
IAC 6.1 Apply proper measuring and cutting techniques to perform job related tasks.
IAC 6.2 Display a working knowledge of tools and equipment used in the industry.
IAC 6.3 Construct a project using the assigned design process.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. The shop is set up much as the student will experience in a wood or manufacturing environment.*	• Search the internet to find out how to build a train whistle and a wooden top. • Measure and lay out the pieces that you will need to build the top and the two tone train whistle. • Critique the safety procedures that the teacher uses when using the power tools to cut out the pieces for your lamp. • Demonstrate the proper use of hand tools in the construction these projects.

		• Apply an approved finish to the lamp and take it home.
Prior Knowledge Needed	**Vocabulary**	**Assessments**
There is no prior knowledge needed for this class.	With this age group it is important to make them feel comfortable asking questions and clarify vocabulary terms as the questions arise.	• Participation in class discussions and willingness to share and offer examples. • Completed project
Relevance: This lesson is designed to broaden the student's horizons and to stimulate an interest in trying new things.	***Examples:***	**Materials Needed:** • Lumber • Hand tools • Fasteners • Glue • Power tools
Reflection: This has been a very popular activity for the students. I really want them thinking about safety and to be willing to call me out if they see something that they think is an unsafe practice. This will stimulate a discussion that need to take place instantly to make them lifelong lessons.	**Essential Questions:** • Can I do this? • Am I concerned about anything that I will be doing? • Do I feel that I can bring my concerns into the open so that we can talk about them? • Have I build anything before this?	

Unit: *It's robot time*	**Time:** *Seventh through ninth week of class.*

Standards Taught

MSMR 1.1 Know the equipment Used in robotics.
MSMR 1.2 Identify Various mechanical systems used in robotics.
MSMR 1.3 Demonstrate the use of programming commands.
MSMR 3.2 propose a robotic design.
MSMR 3.3 Construct a functional robot
MSMR 3.4 Program a robot to perform a specific task.
MSMR 3.5 Evaluate robot programing.

Differentiation/Assessment:	**Classroom Management and Environment:**	**What will the students be doing?**
Students who needed the extra help received guided notes, extra individual practice, and shortened tests.	*The classroom is set up in a "regular class room" like setting. The desks are in rows with space between students so concentration can be maintained. Overall the environment is structured and has rules and procedures in place. The shop is set up much as the student will experience in a wood or manufacturing environment.*	• Watch video on creating robots using LEGO EV3 Mindstorms Robots. • Divide up into groups and develop a plan to create a robot that will complete the task assigned in class. • Construct the robot that the group agreed upon building. • Program the robot using the block codes for LEGO to perform the task assigned in class. • Load and use the application designed by

		LEGO to operate the task assigned in class. • Determine if programing is performing as it should and make adjustments as necessary.
Prior Knowledge Needed	**Vocabulary**	**Assessments**
There is no prior knowledge needed for this class.	With this age group it is important to make them feel comfortable asking questions and clarify vocabulary terms as the questions arise.	• Participation in class discussions and willingness to share and offer examples. • Completed robot • Ability to make robot perform desired task. • Written evaluation of robotic performance
Relevance: This lesson is designed to broaden the student's horizons and to stimulate an interest in trying new things.	***Examples:***	**Materials Needed:** • Lego Robot • Computer • Coding Software • Internet • Miscellaneous classroom supplies • Hand tools

Reflection:	**Essential Questions:**
I have not done this lesson before with Junior High School students so this will be a learning experience for me as well. I am really looking forward to digging into this.	• What is a robot? • Are they difficult to make? • How does it know what to do? • Can they run amuck?