Curriculum Enhancement Plan

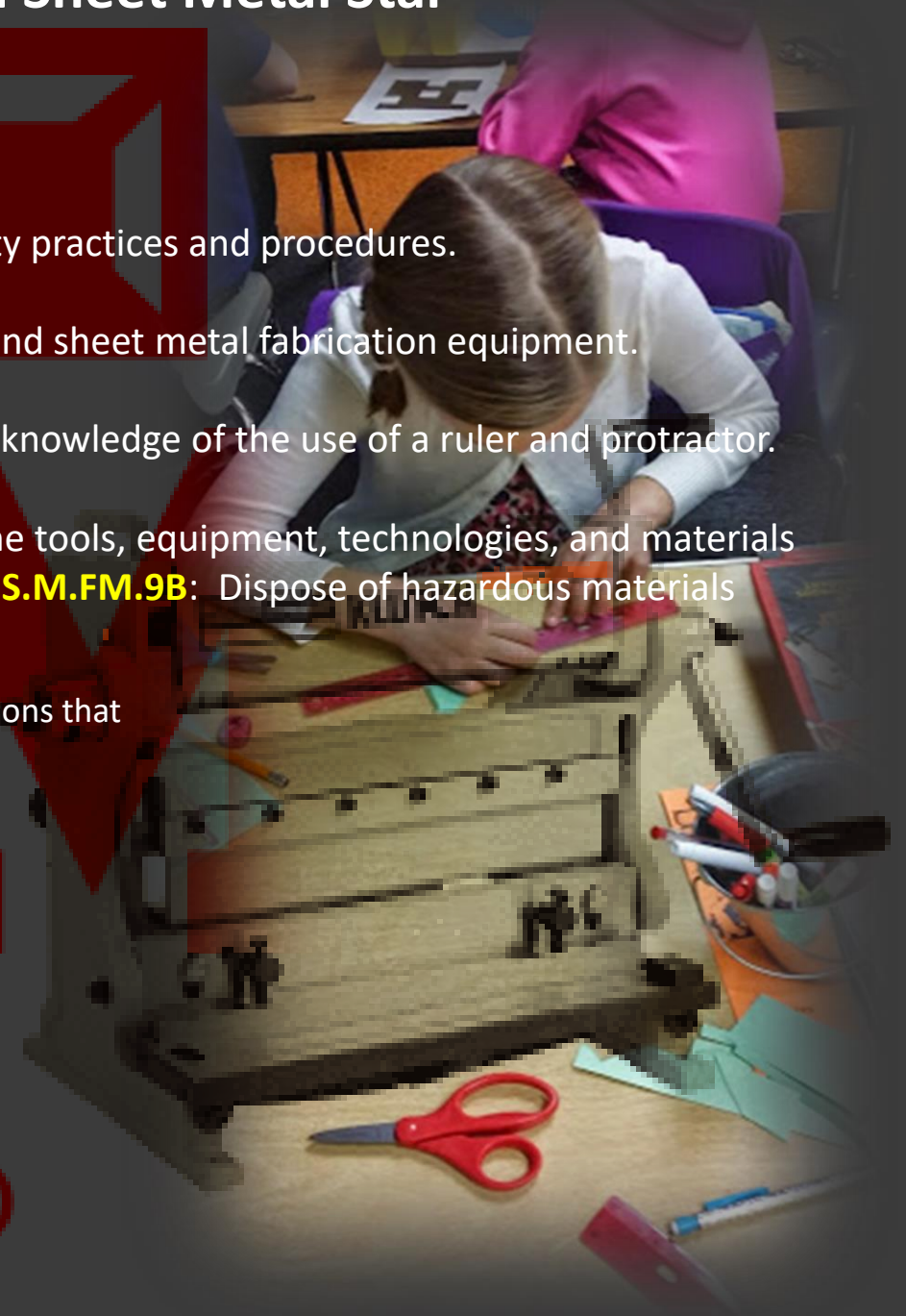
Manufacturing a Sheet Metal Star

How many zombies would Rob Zombie rob if Rob Zombie could rob zombies?

Curriculum Enhancement Plan – Manufacturing a Sheet Metal Star

HOOK: Show students the photos and sheet metal start we created

- Student will **APPLY** the use of measuring tools such as a ruler and protractor.
- Student will **DEMONSTRATE** a general knowledge of shop safety and equipment safety practices and procedures.
- Student will be able to **EVALUATE** a shape and **CREATE** that shape using sheet metal and sheet metal fabrication equipment.
- **Prior knowledge**: Student will be expected to have an elementary and middle school knowledge of the use of a ruler and protractor.
- **TEKS covered**: **HS.M.FM.9**: The student understands the function and applications the tools, equipment, technologies, and materials used in sheet metal manufacturing. **HS.M.FM.9A**: Practice safe use of equipment. **HS.M.FM.9B**: Dispose of hazardous materials used in sheet metal manufacturing.
- **Curriculum Enhancement goal**: Add a Unit to the regular PLTW IED curriculum on Linear Dimensions that introduces basic manufacturing vocabulary and processes.
    - **Desk Work to increase student's understand the concepts**
        - Measuring 90 minutes
            - Daily Quiz grade: Measuring with the ruler and protractor
        - Sketching 45 minutes
            - Major Grade: Quality of the finished product
    - **Shop Work to increase student's understand the equipment**
        - Measuring – 45 minutes
            - Daily quiz grade: Quality of work on creation of the pattern on the sheet metal
        - Manufacturing – 225 minutes



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Tin Snip and Sheet Metal Brake Basics
https://www.youtube.com/watch?v=OteO01hBH24

Sheet Metal Shear basics
https://www.youtube.com/watch?v=Y770ds3xSxA

Spot Welding Basics
https://www.youtube.com/watch?v=ogyBd0CWbS8

Bending Basics
https://www.youtube.com/watch?v=o5zTUo2t7_w
https://www.youtube.com/watch?v=HemwD3NpKXk

Slip Rolling Basics
https://www.youtube.com/watch?v=z5DxuC-nyzM

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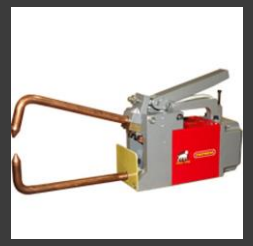
Baileigh 3 in 1 Combination Machine SBR-3020 SKU:1006958 $795
https://www.baileigh.com/shear-brake-roll-sbr-3020

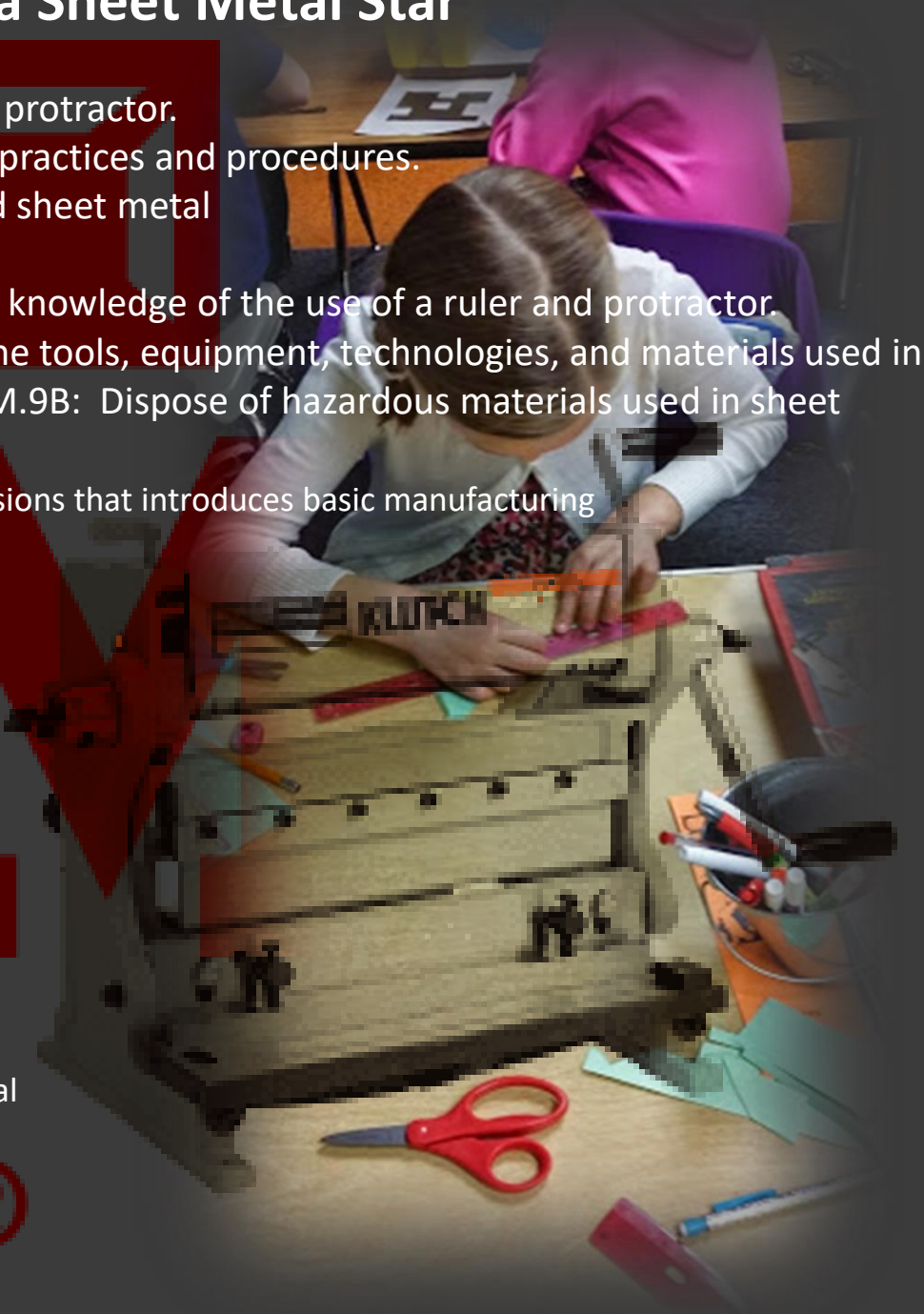


110V/60 Hz Spot Welder Welding Hand Machine Portable Welder Electronic Control 7” Throat Depth $175
https://www.amazon.com/110Volt-Welding-Machine-Portable-Electronic/dp/B008FCJA56/ref=asc_df_B008FCJA56/?tag=hyprod-20&linkCode=df0&hvadid=312134375915&hvpos=1o3&hvnetw=g&hvrand=18292696850246640697&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9027902&hvtargid=pla-669341507682&psc=1

Curriculum Enhancement Plan – Manufacturing a Sheet Metal Star

HOOK: Show students the photos and sheet metal start we created

- Student will understand how to apply the use of measuring tools such as a ruler and protractor.
- Student will demonstrate a general knowledge of shop safety and equipment safety practices and procedures.
- Student will be able to evaluate a shape and create that shape using sheet metal and sheet metal fabrication equipment.
- Prior knowledge: Student will be expected to have an elementary and middle school knowledge of the use of a ruler and protractor.
- TEKS covered: HS.M.FM.9: The student understands the function and applications the tools, equipment, technologies, and materials used in sheet metal manufacturing. HS.M.FM.9A: Practice safe use of equipment. HS.M.FM.9B: Dispose of hazardous materials used in sheet metal manufacturing.
- **Curriculum Enhancement goal**: Add a Unit to the regular PLTW IED curriculum on Linear Dimensions that introduces basic manufacturing vocabulary and processes.
  - **Desk Work to increase student's understand the concepts**
    - Measuring using a ruler – 45 minutes
    - Measuring angles using a protractor – 45 minutes
      - Daily Quiz grade: Measuring with the ruler and protractor
    - Sketching the arm of the star onto construction paper – 45 minutes
    - Cut out the arm of the star using a paper cutter and scissors – 15 minutes
    - Fit the star together using hot glue to replicate spot welding – 15 minutes
      - Major Grade: Quality of the finished product
  - **Shop Work to increase student's understand the equipment**
    - Measuring using a ruler – 45 minutes
    - Measuring angles using a protractor – 45 minutes
    - Sketching the arm of the star onto sheet metal – 45 minutes
      - Daily quiz grade: Quality of work on creation of the pattern on the sheet metal
    - Discussion and presentation on Quality control – 45 minutes
    - Cut out the arm of the star using a sheet metal shear – 90 minutes
      - Daily Quiz grade: Quality check
    - Fit the star together using the spot welding machine – 90 minutes
      - Major Grade: Quality of the finished product



Comments.

1) Is this a new lesson? *Yes, see line 10 "Curriculum Enhancement .." on the previous slide.*
2) Number of items and budget.
   - *Spot welding machine - $ 175*
   - *Combination machine - $795*
   - *Gloves, Goggles, Welding jacket - $200*
   - *48" x 96" sheet metal - $300 (32 projects per s*
3) Mention safety and training. *Safety training is m* *…s slide. I will add a safety quiz to the final product.*
4) How do we measure success? Contribution from … students, girl/boy ratio ? Extend to robotics, competition?
   - *Success is measured by quizzes and the final … star)*
   - *Contributions from TAMU RET Program ($1… …bil ($1000), and the SISD Advisory Board ($3000).*
   - *32 students, 80% male/20% female. I typically do not invite parents into the metal shop but do share photos and final products with them.*
   - *Custom parts created for pre-build competitions such as TAMU SPARK, Tex Ren Fest, Science Olympiad, SECME VEX competition (and other SECME competitions).*
5) Will your school support this? Will need signature of principal.
   - *Yes! I have received approval of the lesson from my Principal. He is having the Fire Marshal ensure the ventilation in the metal shop is sufficient for adding the spot welder to the metal shop.*

1) Please show these in your presentation slides. Make reader counting line # is not fun ;-)
2) Add a slide for budget
3) Add a slide for assessment (measure success)
4) Don't show this slide in your presentation.