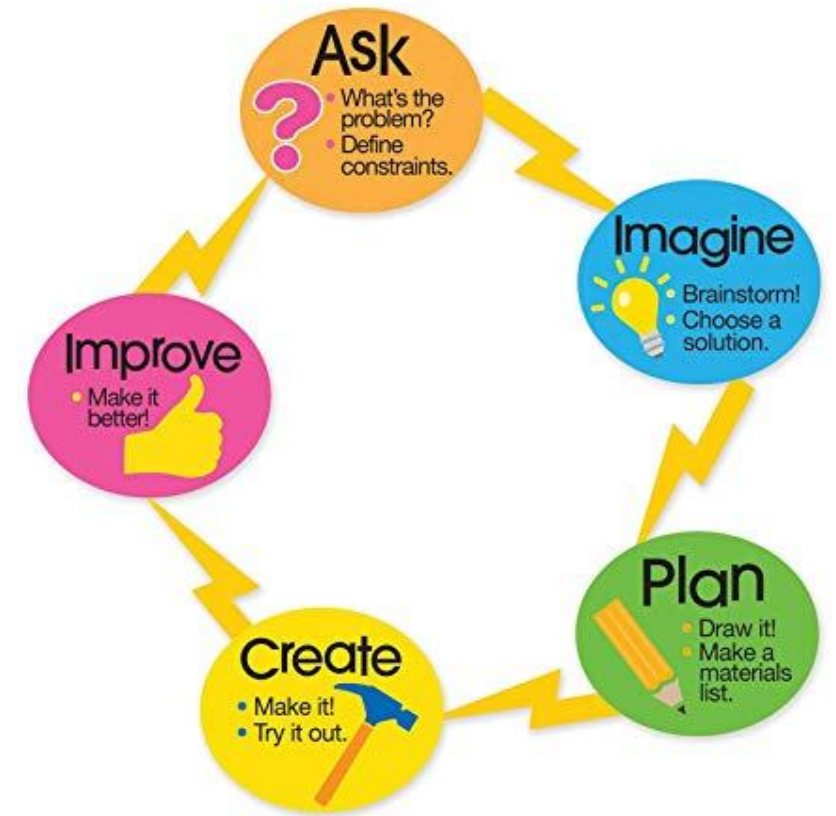


Elementary STEM Integration: Laser Engraving

Audrey Erwin

Inspired by TAMU Summer '19 RET

- What is engineering PowerPoint lesson and engineering notebooks/sketching (Day one and two, week one)
- What is the design process PowerPoint lesson (day three, week one)
- Metrology matters PowerPoint lesson (day four, week one)
- Review game (day five, week one)
- Test over what is engineering, engineering design process, and metrology (day five, week one)



- Introduce Laser engraving project (day six, week two)
 - Using learned metrology skills
 - Real world use lesson
 - Final end product
 - Engineering notebook
 - Sketching with dimensions
 - laser engraved bookmark
- Time frame for laser project
 - Brainstorm Sketch (day six and seven, week two)
 - Computer lab translating image to computer (day six and seven, week two)
 - Using PowerPoint to create image! A demo and tutorial will be given
 - Must have final design sketch approved by end of day seven, week two
 - Engraving final designs (day eight and nine and ten, week two)
 - Bookmarks completely finished end of two weeks
- Measure Success
 - Engineering Notebook check /rubric
 - Book mark rubric
 - Test over basic engineering concepts



Item	Cost & quantity	Source
CorelDRAW	1 time purchase \$50	https://www.coreldraw.com/en/product/corelcad-education-edition/?topNav=en
Laser engraver	1 time purchase \$400	https://www.amazon.com/Orion-Motor-Tech-Engraving-Engraver/dp/B01AJGFS7Y/ref=sr_1_9?crid=1HLVF0Z9IGYSD&keywords=laser+engraver+machine&qid=1562954011&s=gateway&srefix=laser+engraver%2Caps%2C156&sr=8-9
Wood Bookmark/ craft sticks	<p>\$15 per 100 craft sticks</p> <p>I will be teaching about 100 students a year therefore I will need one purchase of about \$15.00 to purchase 100 craft sticks per year</p>	https://www.amazon.com/Wooden-Perfect-Liquids-Improvement-Natural/dp/B07FP1LPTL/ref=sr_1_105_sspa?keywords=diy+wood+bookmarks&qid=1562953918&s=gateway&sr=8-105-spons&psc=1
Total Initial Cost- \$460	Cost yearly after initial purchase- \$15	

§126.6. Technology Applications (b)(4) Critical thinking, problem solving, and decision making. The student applies critical-thinking skills to solve problems, guide research, and evaluate projects using digital tools and resources. The student is expected to:

(A) identify what is known and unknown and what needs to be known regarding a problem and explain the steps to solve the problem;

§126.6. Technology Applications (b)(1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products. The student is expected to:

(A) apply prior knowledge to develop new ideas, products, and processes;

(B) create original products using a variety of resources;

My objective is that students will be able to answer the question- What is Engineering? And Why is it important?

I estimate in one year I will have about 100 4th graders participating in this project.

I also want students to participate in a hands-on activity incorporating laser engraving to use their creativity and inspire them to consider a stem career and/or pursue further research.

Schools will support this because it is a quick introduction to engineering and will be cheap to maintain. I hope to get a grant to purchase the laser engraver. The laser engraver can also be used for other projects such as fundraisers!