

TEACHER QUEST TAMPA BAY PROGRAM

ACTION PLAN

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Lesson Title: Ruling the Laser Engraver

Grade Level: K- 12

Subject Area(s): Science, Technology, Engineering, and Math

Date: 7/15/2010

Summer Work Experience

Engraving Systems Support is a company that specializes in sales and support of laser engraving machines. One priority they have is to support their clients' needs. I have been hired to help with the educational clients.

The first responsibility I have is to edit the current curriculum that was written by two teachers that worked with the Teacher Quest program last summer (Justin Erickson and Ron Jones). I will go through the step by step materials and actually complete the desired projects. (Examples: business cards, pen engraving, plastic truck, architectural model)

Then I will make my own step by step procedure for how to make a ruler and how to use the laser. I will tie all the materials together in a form that can be given out to schools that use a laser engraving system. Students and teachers will learn how to operate the laser and use it to cut out different sizes, shapes, and types of materials. They will also be able to use software they already have available at their schools (ex: Corel Draw, AutoCAD, Solidworks etc).

My last responsibility is to infuse the current curriculum with the K-12 STEM initiative. This will ensure that the curriculum is student/ teacher friendly and following state and national frameworks.

This experience will not only help me learn how to operate the laser but it will help me understand how an actual company operates. I will learn how to operate different lasers and use different software programs. My students will be using this curriculum and software this school year. I plan on partnering with ESS throughout the school year. They have agreed to participate in the Manatee County TSA District competition in February. They will demonstrate laser engraving by engraving on students' cell phones and I-pods. This will build enthusiasm for using the technology in the classroom as well as building business partnerships in education. I will also

learn about different career opportunities. (Secretarial, Accounting, Sales, Customer Service, etc). I can definitely take these skills back to my classroom.

Lesson Plan

Objectives

Elementary:

1. Students will select an appropriate tool, measure, and compute lengths to solve problems.
2. Students will measure objects using fractional parts of linear units such as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$.
3. Students will compare, contrast, and convert units of measure within the same dimension to solve problems.

Middle School:

1. Students will apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.
2. Students will determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures.
3. Students will compare, contrast, and convert units of measure between different measurement systems. (US customary or metric)

High School:

1. Students will apply transformations to polygons to determine congruence.
2. Students will solve real-world problems using measures of circumference, and areas of circles.

Sunshine State Standards

Elementary Math Standards: MA.2.G.3.4, MA.3.G.5.2, MA.4.G.3.3, MA.5.G.5.2, MA.5.G.5.3

Middle School Math Standards: MA.7.A.1.6, MA.7.G.4.1, MA.7.G.4.4, MA.8.G.5.1,

High School Math Standards: MA.912.G.2.4, MA.912.G.6.5,

Materials

Laser

Card stock (thick paper) or 1/8" thick wood or plastic

Instructional Procedures

Elementary – Students will cut whole inch, half inch, quarter and eighth inch marks on a 6 inch ruler using the laser.

Middle School - Students will make a ruler on the laser using the standard customary system and metric system on a 6 inch ruler. This will help students convert inches into millimeters.

High School - Students will use the measuring system on the laser to put text/ graphics on a ruler.

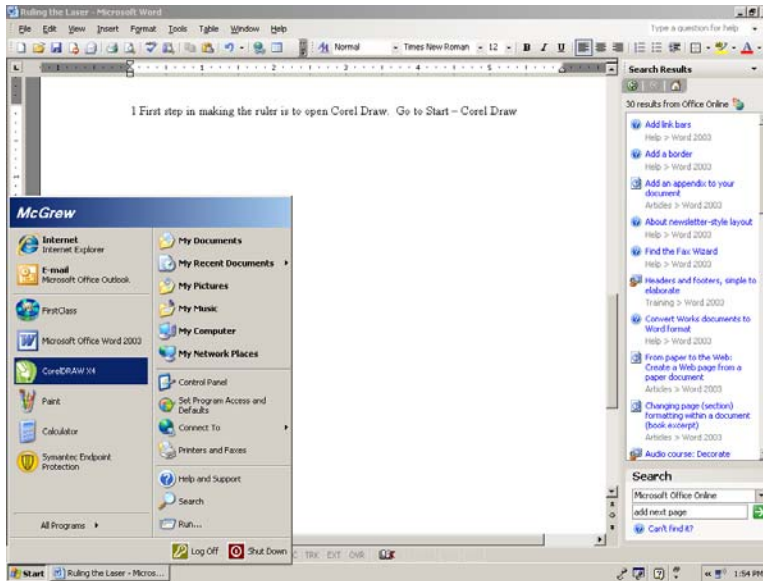
Ruling the Laser

Curriculum for making a 6" ruler using a Universal Laser.



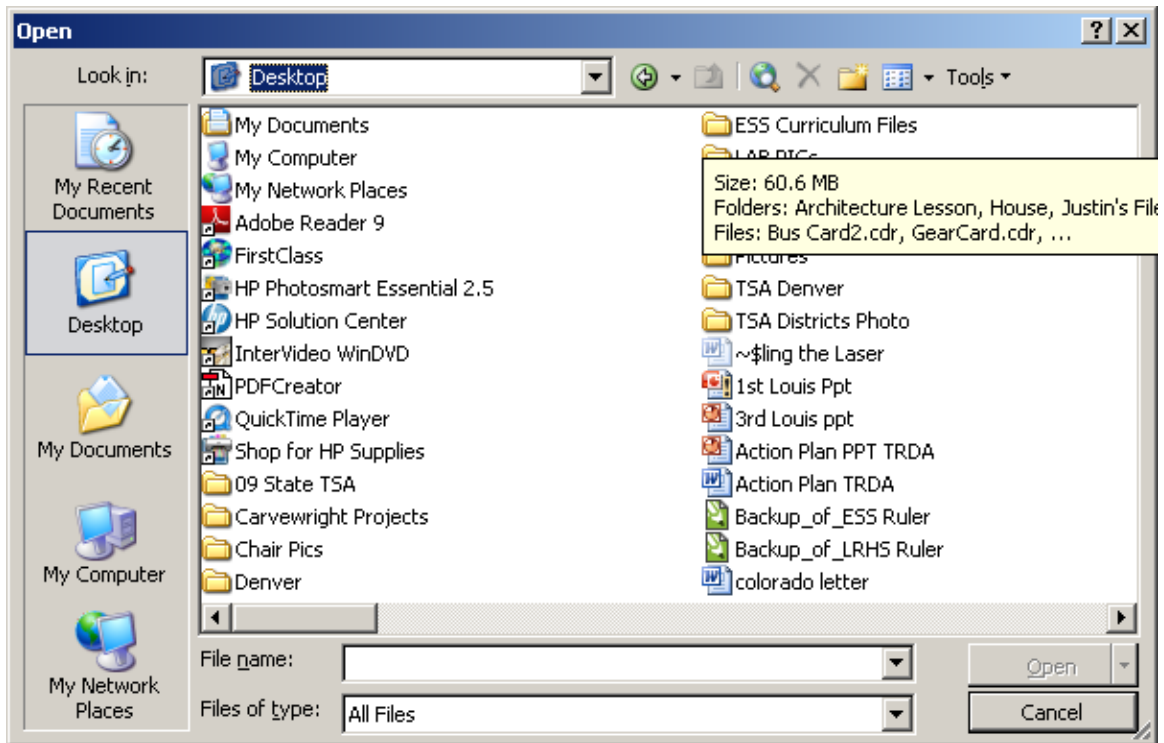
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1 First step in making the ruler is to open Corel Draw. Go to Start – Corel Draw.



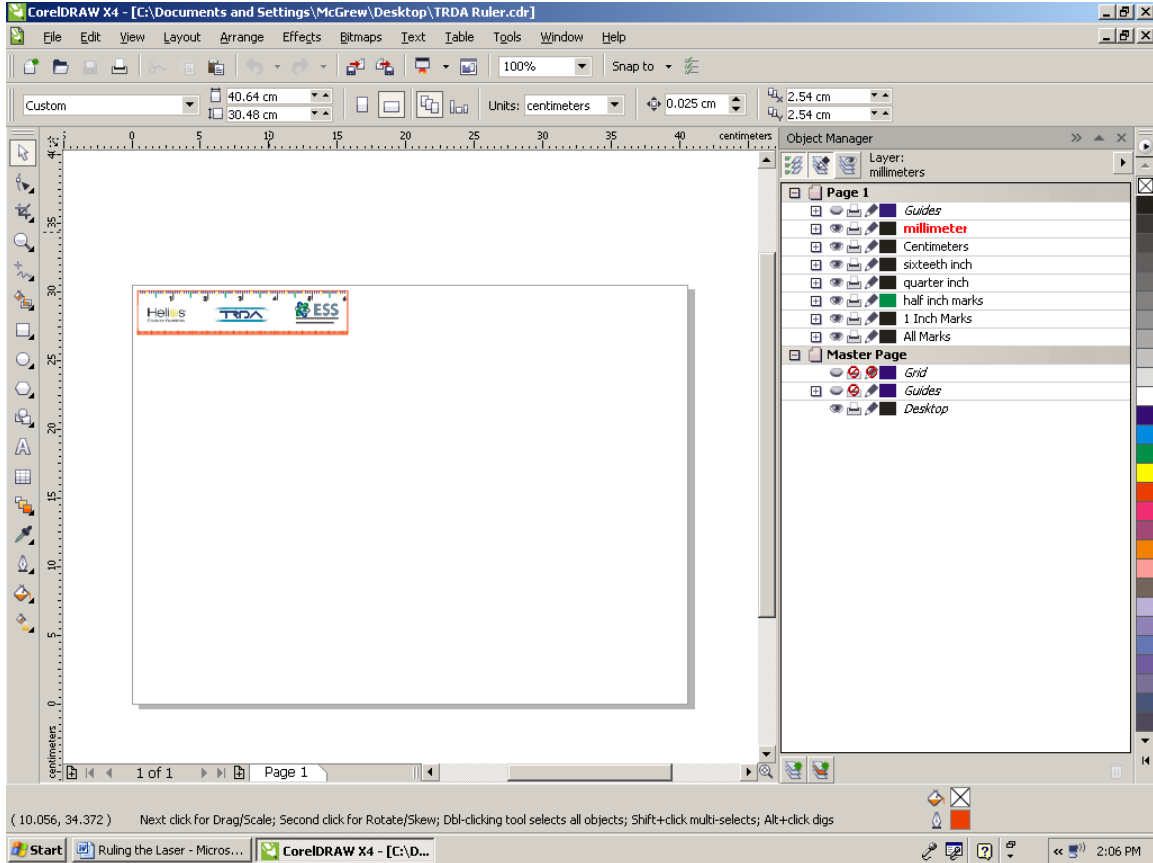
2. Next Go to File-Open.

3. Look-in Desktop or Local disk and open ESS Curriculum Files.



4. Find ESS ruler double click and open.

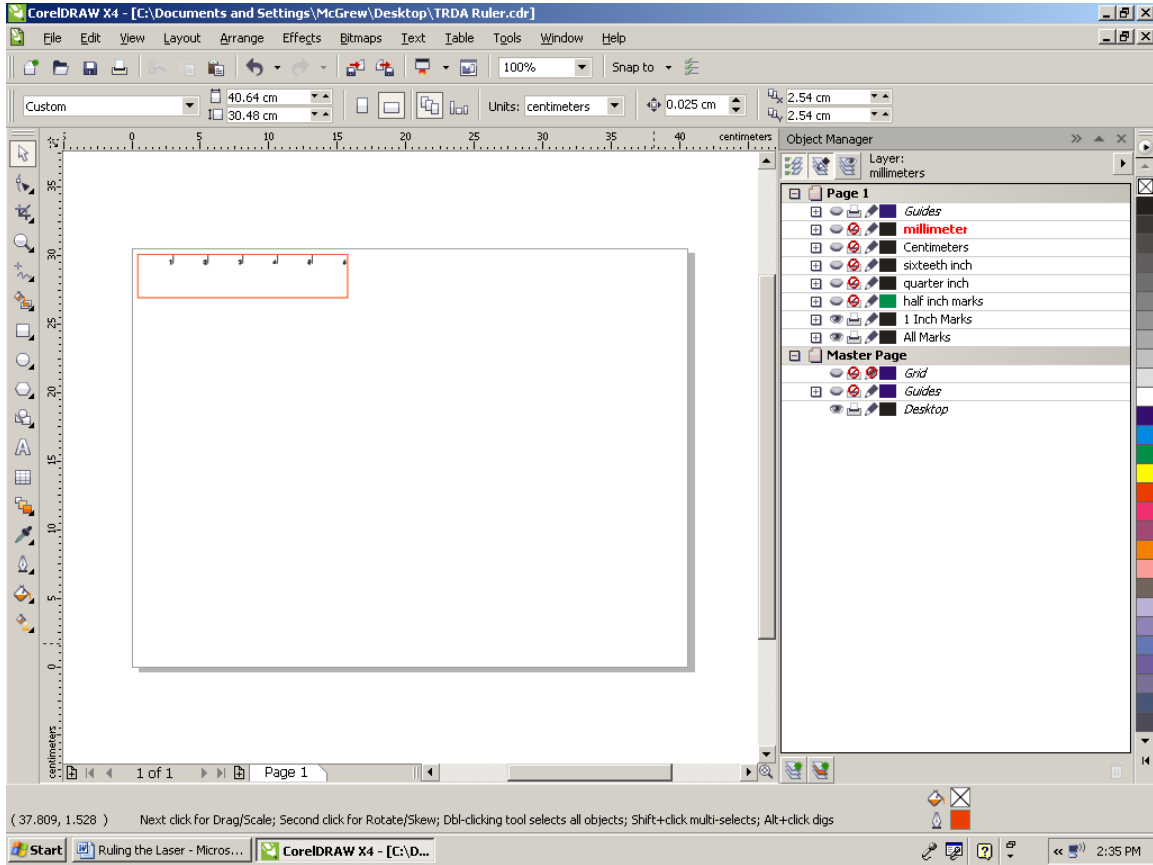
5. Drawing should like this:



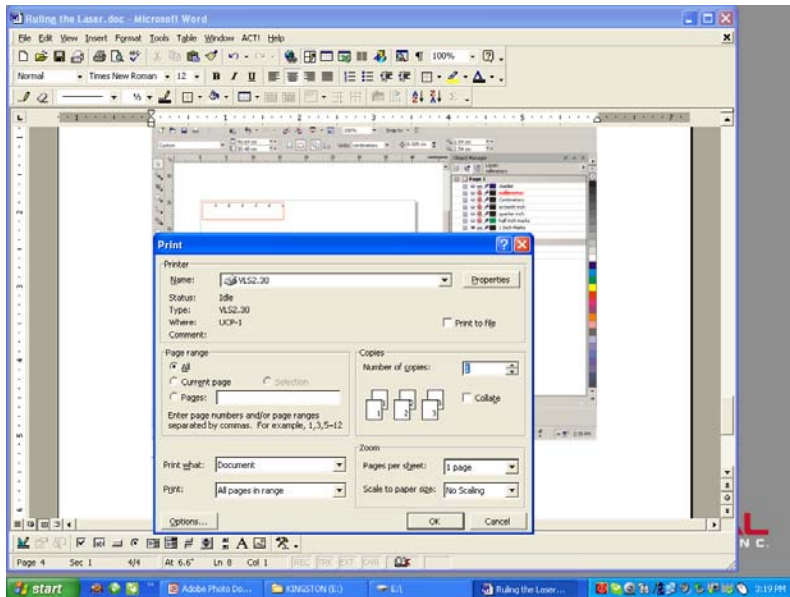
If the Object Manager does not show up on the right side then you can do the following. Click on Window-Dockers- Object Manager.

For this activity we have already made the ruler into layers (inches, half inches, quarters, eighths, sixteenths, etc). This will allow you to print one layer at a time to teach basic measuring skills. You can also print all the layers at the same time to get the entire ruler. It also shows users how the layer feature can be used with the laser.

6. Next, to just print out the inch marks on the laser you will need to turn off the other layers. Click on all the icons of a printer and the eye in the Object Manager except for the printer icon next to the inch marks.



7. Now you are ready to print. Go to File-Print.
Select the type of laser you have in name box (example VLS 2.3) then select properties.



Integration of Summer Work Experience/Follow-up Activities: I will use the instructional procedures in my class. I will also share the curriculum with teachers at other schools. (elementary, middle, and high schools). I would like to follow up by seeing if my students and others can follow the instructions that we have created. I will continue to work with Justin Erickson and build upon the lessons we created. In Manatee County, some elementary schools have started engineering classes. Two elementary schools that later feed into our high school will have access to a laser this year. I plan to implement this curriculum with their schools.

Assessment Instrument: Students can be given an authentic assessment, visual measurement assignments, and students can complete the desired curriculum output on the laser. (example: can the high school student make a ruler with graphics and text in the desired location) Students will be scored using a rubric.

Comments: My desire is to teach a basic skill using some of the best technology available. I believe there are a lot of people (including adults) who cannot use a simple ruler. I feel making education fun will give students a desire to learn. Working at ESS has been a fun way for me to learn new things and meet new people in the engraving industry.