



Welcome to IDEA where  
dreams become reality...





Day 1 – taking care of business

## **Schoology**

Please log into schoology and find your IDEA class.  
In the folder – Intro to IDEA – Please find the first  
day discussion!



## Day 1 – Success....

### **Skills:**

To avoid any misunderstandings or unsatisfactory grades and to fill the Innovation Center with students who genuinely want to learn, students should be ENGAGED and take advantage of the skills and knowledge the Innovation Center has to offer. We wish to make it clear before you begin this course that IDEA is primarily a STUDENT CENTERED class that requires, for success, a great deal of SELF MOTIVATION, SELF DISCIPLINE, SELF ENGAGING, SELF DIRECTION and an ORGANIZED/ENGAGED learner that exhibits above average academic achievement along with a high degree of DEDICATION and RESPONSIBILITY along with COMMON SENSE and above all willingness to put forth effort to RESOLVE A PROBLEM WITHOUT SURRENDERING. The vast majority of work must be completed during class time due to the special equipment needed; students must complete the work in class and be able to ADJUST, MULTI-TASK projects and MEET DEADLINES.

**Students who do not have these qualities struggle to succeed in the IDEA classes.**



## Day 1 – taking care of business

### General

- All school policies stated in the Parent/Student Handbook will be enforced.
- Food or drinks are not allowed in the Innovation Center – you may have water only in the computer lab.
- Do not leave the classroom without permission and the Purple Pass from an instructor.
- You must sign up for Contact Time BEFORE the end of first hour on any given day. Innovation Center Contact spots are limited to 20 students – first come, first served. We will not accept transfers from other teachers during contact time. Please use this time! It will help you get ahead and stay on top of your coursework.

If you would like to come in during other hours of the day you must have that set up ahead of time with your instructor and have a pink pass BEFORE the hour in which you want to work.

- You MUST be dressed appropriately in order to work in the lab. This means YOU MUST HAVE CLOSED TOE SHOES in order to work.



## Day 1 – taking care of business

### Show Character

- Take responsibility for your own learning by setting high standards and doing your own work. While we encourage using your peers as a resource you should learn of the the concepts taught in class for yourself including the set up of machines and use of software.
- Treat others with respect at all times.
- Be prepared for class and be an enthusiastic participant. A large portion of this class is individual work. A student's level of proficiency on any subject/piece of equipment is directly proportional to the amount of time spent on the subject.

**USE YOUR TIME WISELY - THERE IS MORE THAN ENOUGH TIME TO COMPLETE YOUR WORK IN CLASS!!!**





## Day 1 – taking care of business

### **Show Character**

- Be honest, even if it hurts. The only way to be successful is to be honest with the instructor and more importantly yourself.
- Act responsibly and in a mature manner.
- Do what is asked of you, the first time it has been asked. If you have a question – ASK!
- Clean up your own work area when you have completed your work and put away any materials or equipment at the end of the hour. Individual clean up lists will be provided for each machine.

**USE YOUR TIME WISELY - THERE ENOUGH TIME TO COMPLETE YOUR WORK IN CLASS!!!**



# Day 1 – taking care of business

## Be On Time

Be in your seat when the bell rings, anything else is a tardy. We have limited time in each rotation and you will be asked to make up any time during contact time.

## Be Present

**Be physically present** – Come to class. Attendance is critical to the development of your skills and knowledge.

**Be mentally present** – Be alert and participate, do not be distracted by things that have nothing to do with IDEA (homework from other classes, friend drama, etc). You will have to take notes in class on procedures.

The nature of the Innovation Center requires students to have certain freedoms not consistent with other courses, such as working with machinery. The equipment that we have is difficult and expensive to replace and the students need to treat it as their own. A high degree of responsibility is placed on the shoulders of the students not only for themselves, but to help maintain the proper working environment throughout the year. Students will be held accountable for their actions. Any kind of horseplay will not be tolerated.



## Day 1 – taking care of business

### **Use of Electronic Devices:**

You are given the computers, software and equipment to become proficient with these technologies. It is expected that you take advantage of this opportunity; the amount of work and accuracy needed to achieve an acceptable product in the time allotted will involve staying on task and being productive. It is expected that you do not use class time to check non school email, Facebook or other sites/apps that are not directly relevant to your class work.

The use of personal electronic devices is allowed on a limited basis, provided that its use does not interfere with or disrupt classroom or lab instruction or activities. If this becomes a problem you will be asked once for your device. If it is still a problem you will have a conversation with your grade level principal directly as there are other students in the Innovation Center need access to the instructor for learning purposes. It is selfish to take that away from them because you disagree with the school's personal device policy or the instructor.





## Day 1 – taking care of business

**Academic dishonesty:** is defined as: any behavior which results in a student giving or receiving unauthorized assistance or receiving credit for work that is NOT his/her own this work will receive no credit and cannot be made up or redone. While you may be asked to use/improve upon other work that might be out on the web you **MUST** cite any work that is not original to you. This is for the purpose of expanding the knowledge base surrounding digital fabrication labs.

**\*\*\*\*\*** If absent:-you are responsible for making up missed work and putting in the extra time to get the work done. Contact time would also be a great opportunity to make up work...



## Day 1 – taking care of business

### **Homework:**

Most assignments will be completed in class due to the fact that the assignments require special equipment (computer software, Innovation Center equipment, etc). Homework will be limited to being prepared for class and having your websites updated.

As 9-12 grade students, you are expected to behave as responsible adults. Failure to comply with the aforementioned rules and expectations will result in disciplinary action 1. verbal warning 2. parent contact 3. parent contact and office referral.



## Day 1 – taking care of business

### **Grading Policy:**

Academic grades will be given based on the quality of the work and documentation of the process.

This course is constantly being upgraded to improve the educational experience, utilize new technology/equipment and to meet the needs of students. Therefore, assignments and expectation may change throughout the semester.

When a project is complete a grade will be issued based on:

- completion of the required project(s) 10-100 pts each
- notebook checks (every two weeks) 20 pts each
- documentation of the unit in your notebook and on website 30 pts per website page
- completion of the end of unit quiz (if applicable) TBD



## Day 1 – Success....

### **Reading directions:**

Students are expected to read and follow the written procedural step by step directions and should not expect to have the teacher (or other students) standing next to them telling/doing/showing you what to do next constantly. Too often the question ‘What do I do next’ is asked in hopes to avoid reading directions, the answer will be something to the effect “read the directions and when you have a specific question it will be answered.” Directions have been written to guide you along, when you have read, understood, followed, tried, failed, retried and can or have not made positive progress then it is time to ask for guidance.

### **Do high quality work:**

Do not expect an ‘A’ for working hard or effort. Your grade will be based upon meeting or exceeding the requirements for the project and documentation.





# Day 1 –Documentation...

## Documentation

Documentation is the practice of describing an event or process so that an outsider can follow your work and come away with an orderly and logical understanding of what you worked on. This is a standard practice for engineers and designers during the design and building process. In IDEA we will use a web page and designer notebook to document your progress and projects. These web pages will show the final product as well as be used to communicate and share your knowledge and skills that were gained in the course of the project.

## General Documentation Expectations:

- Final version of the project is posted on the web page  
(You must show the project completed and that it works.)
- Designers notebook documents the process from idea to completion
- Complete sentences/paragraphs are used with proper grammar.
- File attachments for all files used are available.
- All sketches/designs/notes are detailed your in notebook



## Day 1 –Documentation...

### **Specific Documentation Requirements:**

Each day students will create a designer notebook entry that includes:

- Progress for the day in paragraph form (Paragraph = 5 Sentences)
  - One paragraph covering any challenges encountered and solutions
  - One paragraph outlining a “win” or something new you learned that day.
- At minimum, one visual such as:
  - A photo of you working
  - Sketches of projects you are working on
  - Screen shots of your files
  - Videos or other digital media etc.

(More specific prompts may also be given depending on projects)

By the end of each project people looking at your documentation should be able to clearly understand what you did and how you completed each assigned project. Your notebook will also help you remember information for your web page. All files should be kept in either a Google folder or your H:Drive. Keeping all of your work on a single flash drive is dangerous and irresponsible.



## Day 1 -Documentation...

### **Ways to lose points on notebook checks:**

- Lack of, incomplete or hard to see visuals (use the snipping tool and take quality photos)
- Unprofessional or unorganized looking notebook (penmanship and organization are graded)
- No/little/minimal/weak/Lack of meaningful, relevant or useful information in the writing prompts.
- Not documenting even if you are gone. (if you are gone you still need to put an entry in your notebook)
- not following the general guidelines discussed in class for setting up and maintaining your notebook



## Day 1 –Building your website (preview)

**Web Hosting:** We will be using [www.weebly.com](http://www.weebly.com) for our student web pages.

- Create a free account on weebly.com using your school issued Gmail address
- Select a suitable theme for your web page. You may change it at any time but it may affect your layout.
- Start to build out your web page. You should have the following:
  - 1) Landing page (home page)
  - 2) Bio page (can be homepage) telling me about you and what you like to do. Add useful and relevant information about you (grade, activities, athletics, job, hobbies, plans after graduation, why did you take IDEA, etc, etc.... )
  - 3) Links to individual unit project pages (you will do one additional web page per unit/project)
  - 4) Any other stuff you would like to add that pertains to this class

Remember that content put on these pages should follow copyright rules and any work that is not your own should be attributed to the original author.





# Day 1 -Homework

## **Due next class:**

-Create a Free Weebly Account and start looking around



## Day 2 -Building your website

**Web Hosting:** We will be using [www.weebly.com](http://www.weebly.com) for our student web pages.

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- Select a suitable theme for your web page. You may change it at any time but it may affect your layout.
- Start to build out your web page. You should have the following:
  - 1) Landing page (home page)
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  - 3) Links to individual unit project pages (you will do one additional web page per unit/project)  
See Example Web Page for heading layout
  - 4) Any other stuff you would like to add that pertains to this class

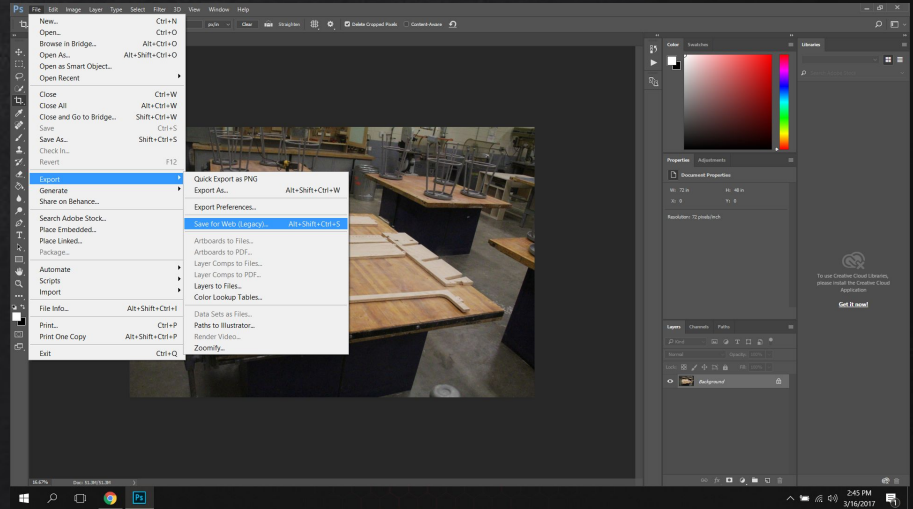
Remember that content put on these pages should follow copyright rules and any work that is not your own should be attributed to the original author.



## Day 2 –Building your website

### Media Storage:

All Media (video/images) should be stored in your Google Drive. With all of your media you may need to compress it so that it fits better on your web page. You will need to use Photoshop to do this. Simply open your photo and use the Export for Web feature. Save your file and you can drag it into weebly.

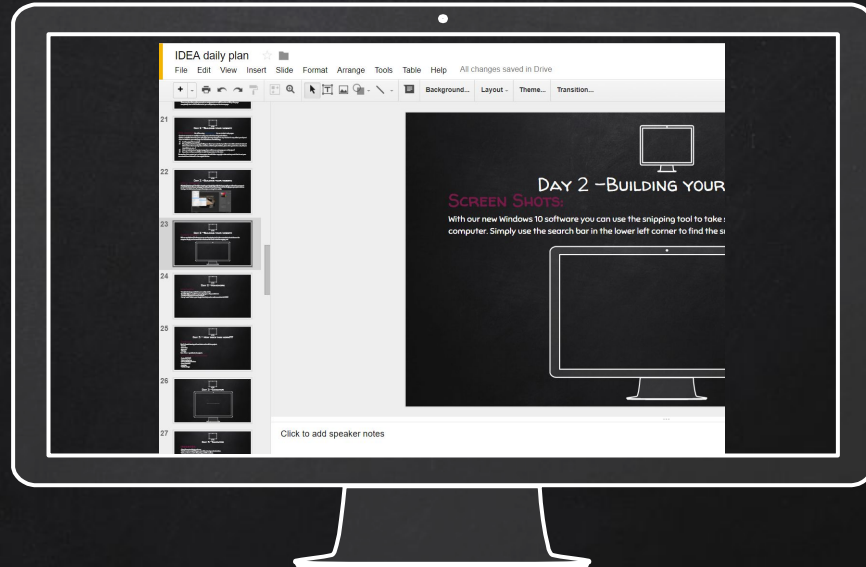




## Day 2 –Building your website

### Screenshots:

With our new Windows 10 software you can use the snipping tool to take screenshots of work done on the computer. Simply use the search bar in the lower left corner to find the snipping tool. Use snipping tool for all screen shots!!!







# TAKE A LOOK AT THESE WEBSITE EXAMPLES

The websites listed below should be used as examples of what your sites should look like. They are well done, thorough and complete.

[Riley Collins](#)

[Alana Hyman](#)

[Cameron Werner](#)

[Isaac Uppena](#)

[Elizabeth Hankins](#)

[Emory Lietz](#)

[Garrett Helwig](#)

[Tyler Homan](#)

[Jacob Grommon](#)

# Weebly Webpage and Shared Google Doc

- Everyone Open: <https://innovationcenterwaunakee.weebly.com>
  - Click on the star next to the search bar
  - Add to the bookmark toolbar
- 

- Add your email to the google doc on Mrs. Proctors computer
  - Open your email and add your weebly website to the shared doc
- 

WORK TIME ON WEBPAGE – Home and About pages due next class

After 45 minutes take a field trip to my other room and get our designer notebooks



## Day 2 -Notebooks

### **Designer Notebook:**

While you are in IDEA you will be required to document your work in two ways. The first will be a Designer notebook. This notebook will be used to document your day to day activities. The purpose of these notebooks is to give outsiders an insight into your work and help you to remember things that you have done during your rotations.



## Day 2 -Notebooks

### **Designer's Notebook:**

A designer's notebook is a book in which you will formally document, in chronological order, all of your work that is associated with each IDEA design project. A guideline to good designer notebook entries is located in the resources on the weebly site.

- It should be a clear and detailed description of your daily project process.
- Someone unfamiliar with work could look at your work take over or recreate your project without additional information.





## Day 2 -Notebooks

### **Designer's Notebook:**

- All work is in pen. (Sharpie Pens are recommended)
- Markers that bleed through the paper are not used.
- Pages are sequentially numbered in ink on the top outside edge.
- Notebooks are bound.
- Cannot add pages
- Cannot remove pages



## Day 2 -Notebooks

### **Designer/Engineer's Notebook:**

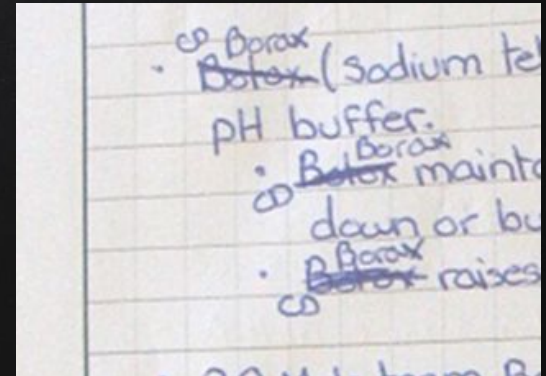
- All pages are Numbered
- Dated
- Signed by the designer
- Signed by a witness



## Day 2 -Notebooks

### Designer/Engineer's Notebook:

- If you make a mistake simply draw a line through your mistake and correct it
- NO loose sheets of paper allowed in your notebooks - they will disappear
- All items must be securely attached in your notebook using glue or tape
- You must sign across any item you place in your engineering notebook
- Add a box around the item you paste into your notebook.
- Only write/work on the right hand page of your notebook.
- Date each entry
- Add page number in the upper right of each page
- Sketches should be large enough to see clearly....





## Day 2 -Notebooks

### **Designer's Notebook:**

At a minimum each day you are in class you should include the following in your engineering notebook:

- A minimum of one paragraph explanation of one item that was a source of struggle or frustration for you
- A minimum of one paragraph explanation of one item that was a “win” for you
- One picture or sketch (if appropriate) from that day.

There may be other writing prompts or assignments as well. If you do not fill up the page completely that is OK! Please do not put multiple days on the same page.





## Day 2 -Homework

### Homework:

- Complete land page and bio for your weebly website including photos.
  - DUE at the beginning of next class. Mrs. Proctor will be grading these!
- Complete daily entry into your notebook using the basic format talked about in class.
- Set up “IDEA Media” folder in your Google Drive (only use for media associated with IDEA)
- Hand in policy sheet if you have not done so
- Collect items needed for class: Flash drive - Folder



## Day 3 - How does this work???

### **Schedule:**

First 2-3 weeks learning software basics and small intro projects

- Inventor

- Illustrator

Rest of time - specialized unit projects

### **Specialized Software:**

- Fusion 360 (CAM CNC Mill/Router)

- Makerbot Desktop (3D printers)

- Universal Laser Interface (UCP)

- Forest Scientific (CNC ROUTER)

- Path Pilot (CNC MILL)

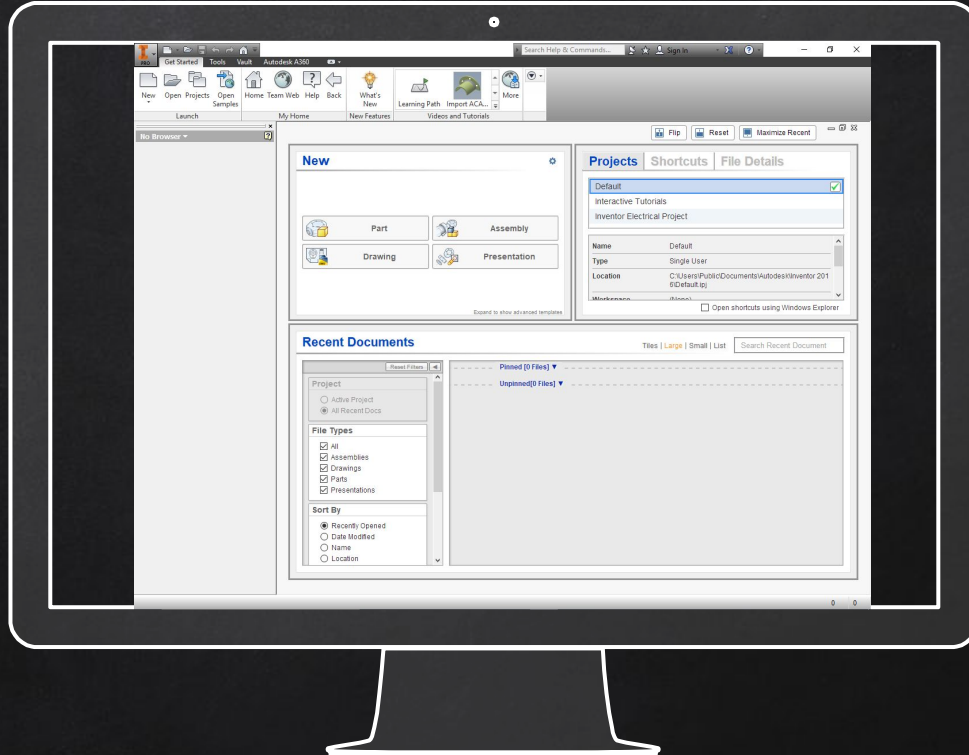


## Day 3 - 3D printing





# Day 3 -Inventor





## Day 3 -Inventor

### **INVENTOR KEY IDEAS:**

- Three Dimensional design software
- Used to create complex shapes, assemblies, drawings and animations
- Software that is crucial to 3D printing and CNC machines
- Uses additive and subtractive methods to create parts
- Changes filter up through all file types in a project.

Key terms: .ipt, .idw, .iam, parametric, additive method, subtractive method





## Day 3 -Inventor

### **INVENTOR:**

- Three Dimensional design software.
  - Used by industry for creation of 3D items
  - Can be used to “test” designs using different functions within software
  - Licensed by the district because of PLTW
- Used to create complex shapes, assemblies, drawings and animations
- Software that is crucial to 3D printing and CNC machines
- Uses additive and subtractive methods to create parts
  - Additive method = Adding material to an object
  - Subtractive method = remove material from an object
- Changes filter up through all file types in a project.
- Parametric = can use math to scale entire item/parts of item based on a single dimension



## Day 3 -Inventor

### **INVENTOR File Types:**

- .IPT = part file - most basic file used in Inventor. Think puzzle piece
- .IAM = Assembly - multiple parts joined together. Think finished puzzle (can be sent to CNC machines and 3D printers.
- .IDW = Plan view of your item. Think blueprints. (Can be sent to Laser Engraver for cutting)
- .IPN = Animation of moving parts. Think of this file as a demonstration on the computer.



## Day 3 -Inventor

### INVENTOR:

#### Assignment:

- 1) Sketch all 6 widgets using isometric graph paper -  $\frac{1}{4}$  inch isometric
- 2) Create Daily Entry in notebook:
  - a) Put two of the six sketches in notebook (use graph paper) - counts as picture for today
  - b) A minimum of one paragraph explanation of one item that was a source of struggle or frustration for you
  - c) A minimum of one paragraph explanation of one item one item that was a “win” for you
- 3) Start drawing all six widgets using Inventor and save as .ipt file in your H:drive
- 4) Choose one of five (2-6) widgets you drew on your own using Inventor.
  - a) Document steps/work in notebook and website - explain how you drew one widget specifically (photos/screens)
- 5) Save all widgets to your H:drive when complete as “Last\_First\_widget#”



## Day 4 – Inventor Work Day

### INVENTOR WORK DAY:

Today:

- 1) Continue to work on drawing widgets on your own using Inventor
  - a) All widgets must be 1" – Isometric graph paper is  $\frac{1}{4}$ " per line
- 2) Save all widgets to your H:drive when complete as "Last\_First\_widget#"
- 3) Create Daily Entry in notebook:
  - a) Progress for the day in paragraph form
  - b) Challenges encountered with solutions
  - c) Things I learned learned today
  - d) At minimum, add one visual such as pictures.
- 4) Start updating website
  - a) Use page titled "Inventor"
  - b) Choose one widget and explain how you drew that widget using words/photos/screens
  - c) Eventually we will also add the 3d printing of your part



# Individual 3D printing Assignment

## Assignment:

For your 3D printing assignment you must use a Design software to create one of the following items. MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section titled “INDIVIDUAL 3D PRINTING ASSIGNMENT”

1. A decorative holder that successfully holds your cell phone (cord management optional)
2. An organizational device that neatly holds no less than:
  - a. 50 pennies
  - b. 40 nickels
  - c. 50 dimes
  - d. 40 quarters
3. A device that neatly holds 4 toothbrushes
4. A device that organizes a set of earbuds and attached cord
5. Your print needs to fit within a 5” x 5”x 5” cube





# Inventor/Makerbot Desktop website update

Once you have your final print you can finish updating your “Inventor” page. You should include these items on your page:

1. Description of what Inventor is/does
2. Sketches from your designer notebook
3. Step by step “recipe” for how you created one widget including text and screenshots
4. Screenshots of the other 5 widgets you drew in Inventor
5. Screenshots from setting up your print using Makerbot Desktop
6. Screenshot of your preview screen
7. Pictures of your item printing/you using the 3D printer
8. Pictures of your final part printed out
9. Summary paragraph of what you learned/accomplished in this introduction to Inventor/3D printing



## Day 5 - 3D printing





## Day 5 – Inventor Work Day

### INVENTOR WORK DAY:

Today:

- 1) Finish drawing widgets on your own using Inventor
- 2) Save all widgets to your H:drive when complete as “Last\_First\_widget#”
- 3) Create Daily Entry in notebook:
  - a) Progress for the day in paragraph form
  - b) Challenges encountered with solutions
  - c) Things I learned learned today
  - d) At minimum, add one visual such as pictures.
- 4) Work on updating website “Inventor” page
  - a) Include a description of what Inventor Software does/how it is used
  - b) Choose one widget and explain how you drew that widget using words/photos/screens
  - c) Include screenshots of remaining 5 widgets to prove you have them done



## Day 5 – 3D printing

### 3D Printing:

- 3D printing is an ADDITIVE MANUFACTURING process which involves the building up of layers to create a solid object.
- We have:
  - 8 Makerbot machines that print in PLA (build volume 9.9 L x 7.8 W x 5.9 H in)
  - I Kit machine which is set up for Ninja Flex
- You will use the Makerbot machines for IDEA to print out your parts
  - Parts must fit into build volume – you can combine multiple prints/parts in one job



## Day 5 – 3D printing

### Steps for 3D Printing:

**Step 1:** CAD – Produce a 3D model using computer-aided design (CAD) software. The software may provide some hint as to the structural integrity you can expect in the finished product, using scientific data about certain materials to create virtual simulations of how the object will behave under certain conditions.

CAD – Computer Aided Design





## Day 5 – 3D printing

### Steps for 3D Printing:

**Step 2:** Conversion to STL – Convert the CAD drawing to the STL format using the “save as” command. STL, which is an acronym for standard tessellation language, is a file format developed for 3D Systems in 1987 for use by its stereolithography apparatus (SLA) machines – early 3D printers....



## Day 5 – 3D printing

### Steps for 3D Printing:

**Step 3:** Open STL file using the Makerbot Desktop software on your computer. Here you will be able to set up your print file. You may move your object around the build plate, change your orientation and manipulate various parameters. The Makerbot desktop will also allow you to approximate the print time and total material used in the print. Knowing these things will allow you to figure out the cost of your project to print.



## Day 5 - 3D printing

### Steps for 3D Printing:

**Step 4:** Machine Setup - Each machine has its own requirements for how to prepare for a new print job. This includes making sure there is filament in the machine, making sure the build plate is ready to go and making sure your file is loaded correctly on the machine. These machines are NOT networked to help control who is using the machines. If you need ANY help talk to Mrs. Proctor!!!!



## Day 5 - 3D printing

### Steps for 3D Printing:

**Step 5:** Build - Let the machine do its thing; the build process is mostly automatic. Each layer is usually about 0.1 mm thick, though it can be much thinner or thicker depending on the object's size, the machine and the materials used. This process could take hours or even days to complete. Be sure to check on the machine periodically to make sure there are no errors. Usually once the raft has been completed the machine will run on it's own.



## Day 5 – 3D printing

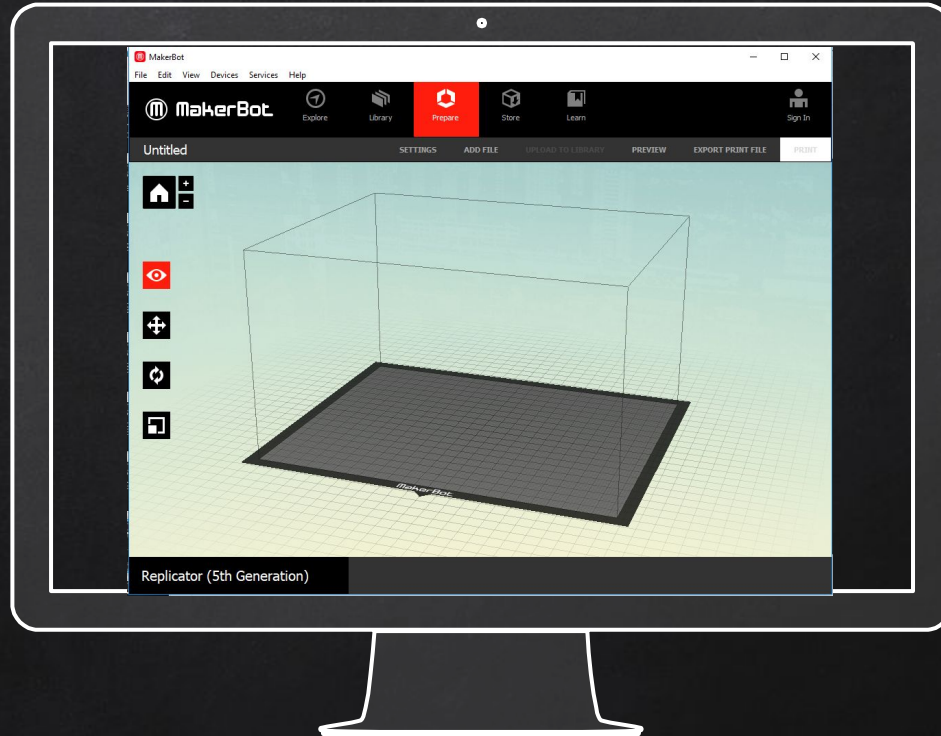
### Steps for 3D Printing:

**Step 6:** Removal – Remove the printed object (or multiple objects in some cases) from the machine build plate using a putty knife. Be sure to take any safety precautions to avoid injury such as wearing eye protection. Place all raft and support material in the small white trash can to be recycled.





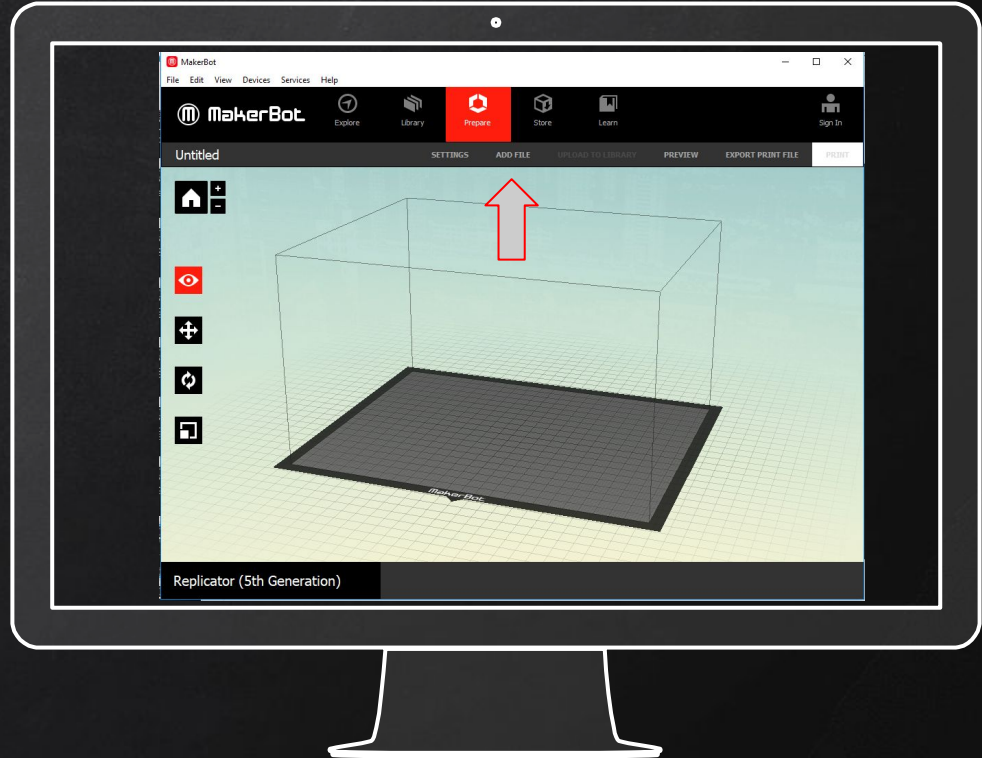
# Day 5 - Makerbot Desktop





# Open STL file

Click on the ADD file  
button  
Locate your stl file



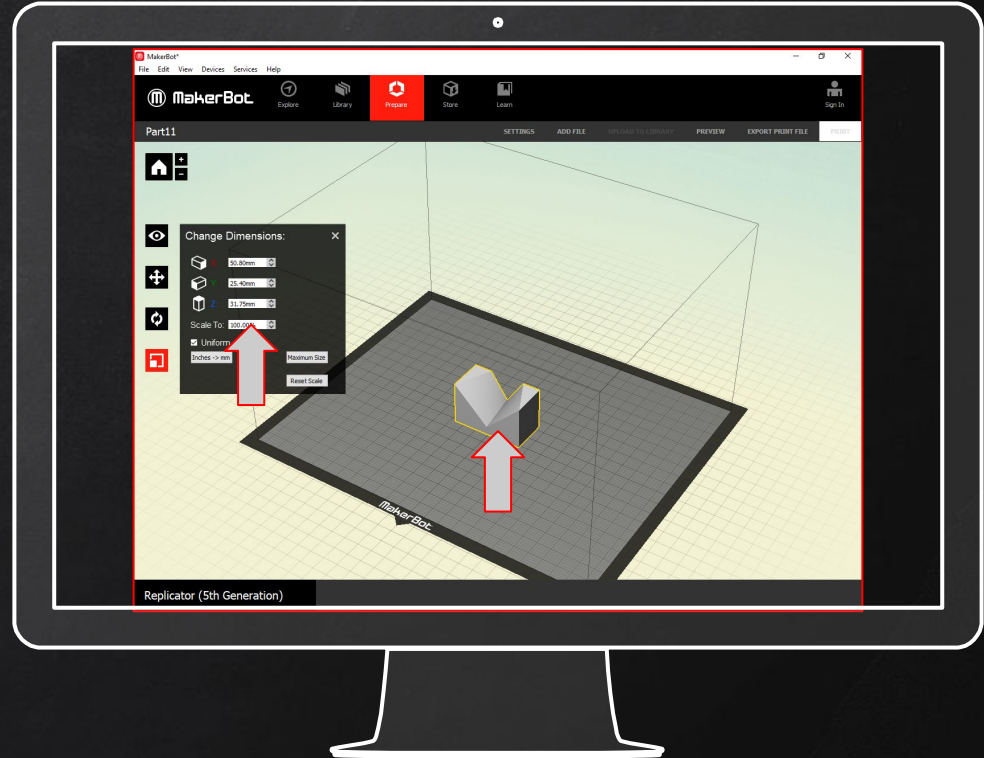


# Open STL file

Load your file and make sure your scale looks correct.

*\*hint\** you will need to change the scale to 1000 percent

(always check that the mm convert to the size of your file)

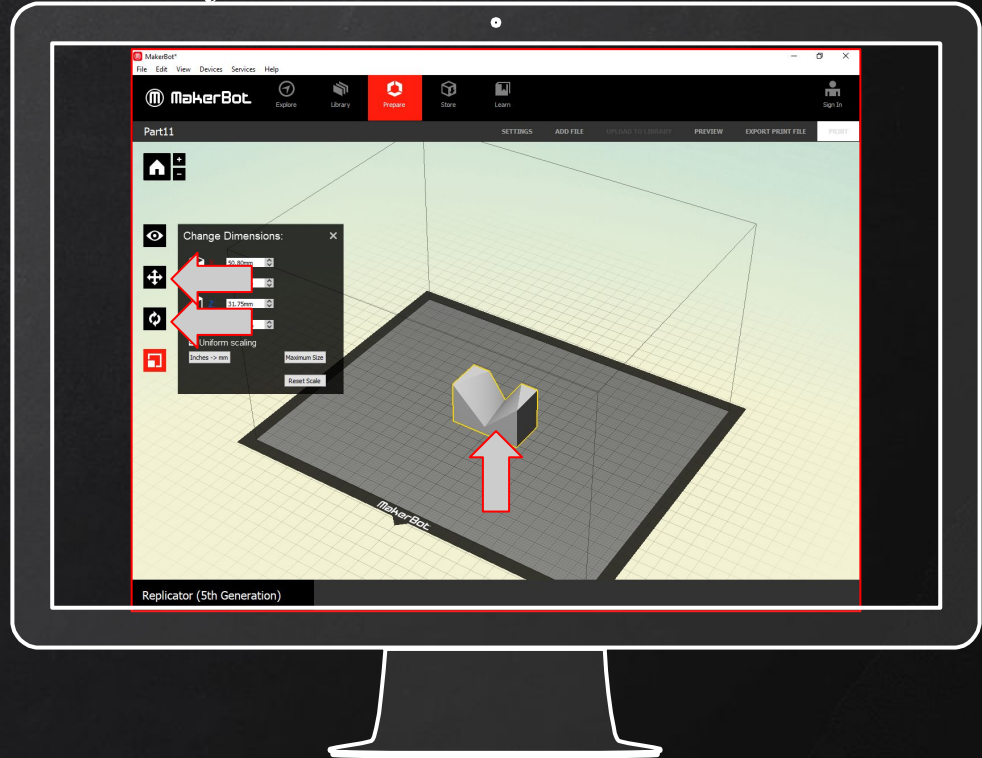




# Adjust Orientation of your STL file

Rotate and move your object so that it will print properly. You will need to keep in mind that the orientation of your object could affect your print!!!!

YOU MAY NEED TO WORK WITH RAFTS AND SUPPORTS DEPENDING ON YOUR FILE SHAPE!!!

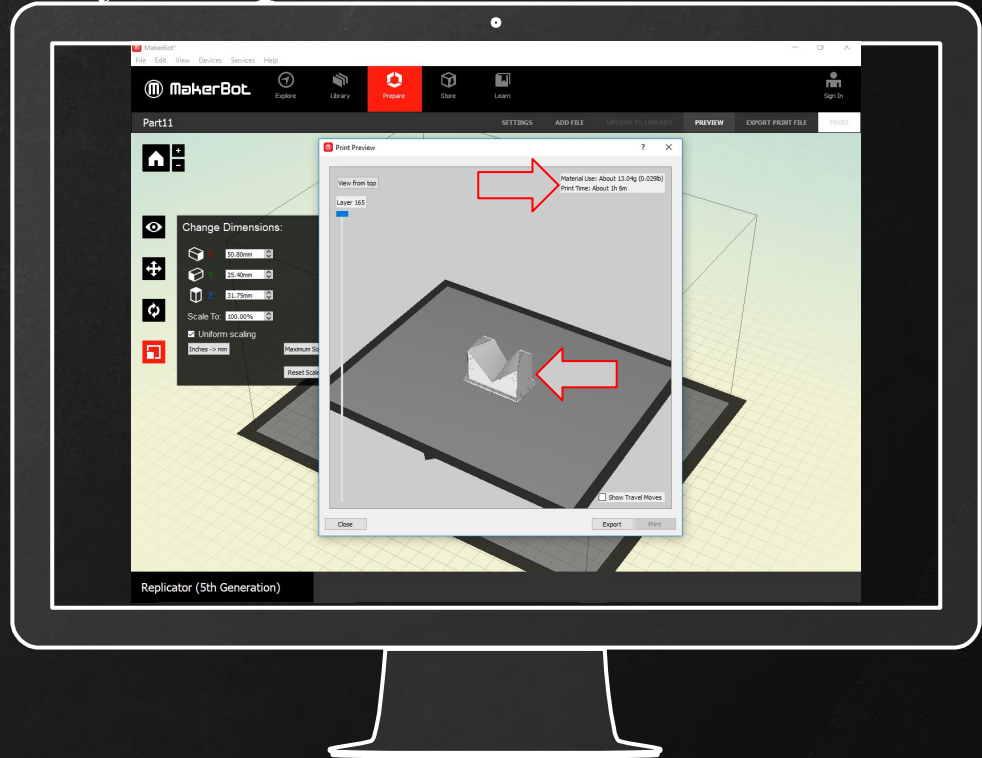






## Day 5 – Preview your print file

Click on the preview button. This will give you a chance to look at your file, all the layers to your file and tell you how long it will take. It will also tell you how much material it will use. The Makerbot filament costs 0.06 per gram.

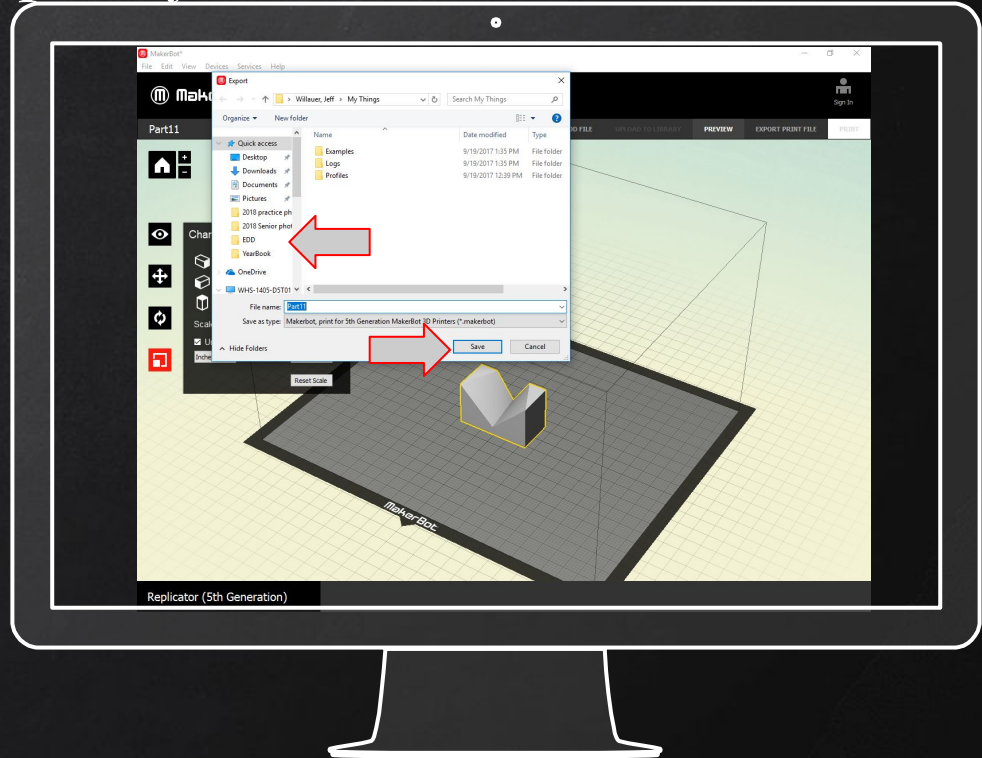






## Day 5 – Export your file

Once you are happy with your preview you can click the “export” button. Save your file to your flash drive and move down to the lab. Make sure you put your last name somewhere in the file name so we know who the file belongs to





## Day 5 – Inventor Work Day

### INVENTOR WORK DAY:

Today:

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  - b. 40 nickels
  - c. 50 dimes
  - d. 40 quarters
3. A device that neatly holds 4 toothbrushes
4. A device that organizes a set of earbuds and attached cord
5. Your print needs to fit within a 5” x 5”x 5” cube





## Day 6 - 3D printing





# Clean Up Jobs – 1B

## **Zach** – Computer lab Computers/Cups

All computers need to be logged off, straightened up and cups returned to black before you leave

## **Malachi**– Computer lab chairs

All chairs need to be pushed in before you leave the room

## **Chase**– Sweep Floor Innovation Center

The floors need to be spotless when you leave. Don't sweep too early.

## **Kaden** – Dust Pan/sink

## **Vincent** – Innovation Center Chairs

All chairs need to be pushed in and in their correct spots

## **Drew** – Hold the door for Trash

## **Logan**– Safety Glasses

Put in case and all turned the same direction

## **Austin** – Large Table/Light Table Clean up

Clean up any paper, put away tools in labeled areas

## **Pavelt** – Take Trash out (Don't do this too early)

## **Steven**– Take Trash out (Don't do this too early)

## **Cooper**– Vinyl Cutter Clean – up

Put away tools, rolls of vinyl, check the floor

## **Daniel**– 3D printer Station

Recycle any unused filament, put away any tools/flash drives

## **Laren Gomez** – Sweep Floor Innovation Center

The floors need to be spotless when you leave. Don't sweep too early.

## **Jake** – Vinyl Drawer (Tools are organized)

## **Marissa** – Vacuum Carpet

The floors need to be spotless when you leave. Don't vacuum too early.

## **Ethan/Evan** – Vacuum CNC/Mill area and inside machines

## **Magnus** – Organize Tool Chest

## **Nate** – Duster

## **Sara**– Check computers for flash drives and make sure all flash drives are hung up

## **Max**– Laser Station Clean-up/Vacuum

All materials from the area need to be put away and tools, exhaust turned off

## **Laren Gruenloh** – Pick up job of missing student

# Clean Up Jobs – 3B

**Preston** – Computer lab Computers/Cups

All computers need to be logged off, straightened up and cups returned to black before you leave

**Willy**– Computer lab chairs

All chairs need to be pushed in before you leave the room

**Zach**– Sweep Floor Innovation Center

The floors need to be spotless when you leave. Don't sweep too early.

**Kai** – Dust Pan/sink

**Ella** – Innovation Center Chairs

All chairs need to be pushed in and in their correct spots

**Taylor**– Hold the door for Trash

**Carter**– Safety Glasses

Put in case and all turned the same direction

**Jake**– Large Table/Light Table Clean up

Clean up any paper, put away tools in labeled areas

**Graham** – Take Trash out (Don't do this too early)

**Nolan**– Take Trash out (Don't do this too early)

**Bailey**– Vinyl Cutter Clean – up

Put away tools, rolls of vinyl, check the floor

**Josh**– 3D printer Station

Recycle any unused filament, put away any tools/flash drives

**Harrison** – Sweep Floor Innovation Center

The floors need to be spotless when you leave. Don't sweep too early.

**Eric** – Vinyl Drawer (Tools are organized)

**Matthew** – Vacuum Carpet

The floors need to be spotless when you leave. Don't vacuum too early.

**Sam** – Vacuum CNC/Mill area and inside machines

**Isaac** – Organize Tool Chest

**Caeden** – Duster

**Elliot** – Check computers for flash drives and make sure flash drives are hung up

**Calvin**– Large Table Clean up

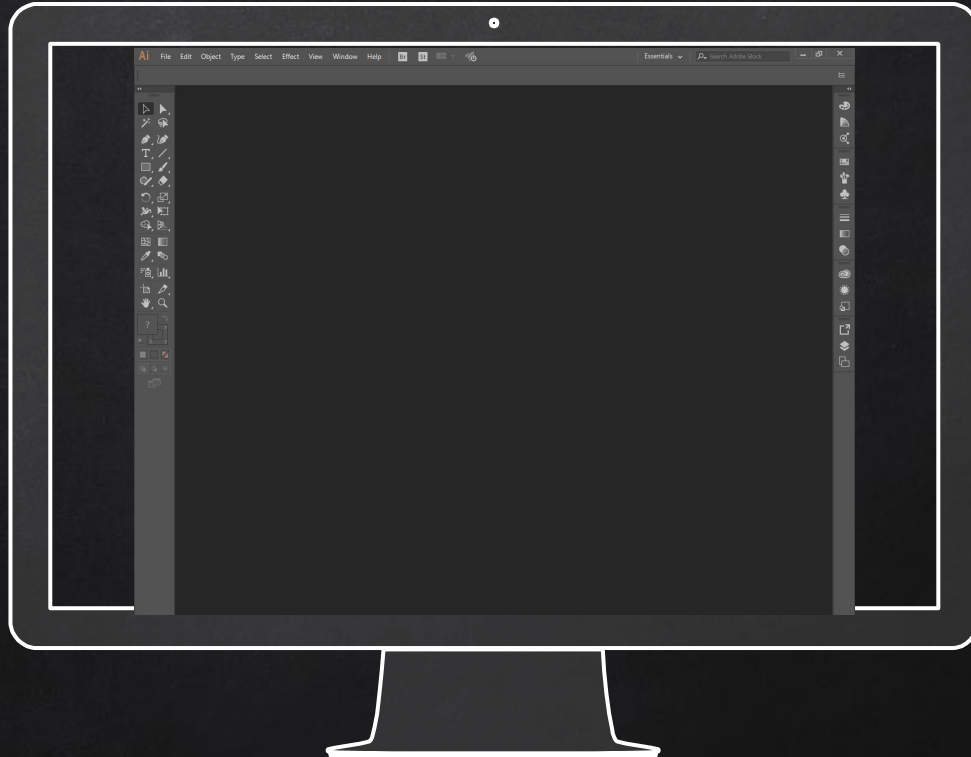
Clean up any paper, put away tools in labeled areas

**Tyler** – Laser Station Clean-up/Vacuum

All materials from the area need to be put away and tools, exhaust turned off



# Day 7 -Illustrator





## Day 7 -Illustrator

### ILLUSTRATOR KEY IDEAS:

- Vector Design Software - 2D
- Used to create/Edit artwork used on the laser and vinyl cutter
- Can use files from Inventor if saved correctly
- Creates VECTOR art which can be scaled up or down with no distortion
- Part of the Adobe Suite which includes Photoshop and InDesign as well

Key terms: Vector Art, Raster Art

The difference between vector and raster graphics is that raster graphics are composed of pixels, while vector graphics are composed of paths connected by anchors. A raster graphic, such as a gif or jpeg, is an array of pixels of various colors, which together form an image. A vector graphic, usually saved as a pdf, is made up of shapes layered on top of each other that are often logos.



## Day 7 -Illustrator



vector



raster

*FLIKLI*





## Day 7 -Illustrator

### How does the laser work?

Our laser uses a CO2 laser to remove material from various materials. In order to do this the laser uses the color of lines in Vector art to burn and cut images. While we can custom setup the laser to recognize various colors the default colors that the laser can understand are as follows:

Red lines - Vector Cut

Blue Lines - Vector Engrave (sharp outlines)

All other color - Raster Engrave

In order to cut objects out you MUST have the line set to .0001 and be in RGB red.

# Key Chain Examples





## Day 7 – Wrapping up

### Reminders:

- 3D prints need to be done by **Friday 9/27**
- Inventor/3D webpage is due on **Monday 9/30** look at the rubric under the weebly resource tab to see what you should have on it.
- Notebook check due **Friday 9/27**
- We will finish work on individual 3D printing assignment at a later date during your rotations.
- Make your daily entry in your Designer Notebook
- Work on your keychain in Illustrator



## Day 8 -Using the laser





## Day 8 -Using the laser

### Today:

- Small groups will be learning how to set up and run their keychain on the laser
- While your group is waiting to use the laser you can:
  - Print off widgets
  - Finish updating your designer notebook and web page
  - Work on finishing your Illustrator keychain file
  - Work on your individual Inventor project in notebook
  - Start working on Illustrator design for Notebook in laser rotation
  - Start thinking about what you will do for your Laser projects by browsing [Thingiverse](#) for potential 3D printer and Laser projects





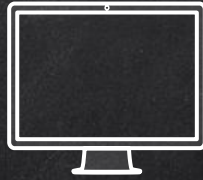
## Day 9 -Using the laser

### Today:

Finish Running Laser Keychains and learn how to work up vinyl design.

While your group is waiting to use the laser and learn vinyl you can:

- Print off widgets
- Finish updating your web page
- Work on finishing your Illustrator keychain file
- Work on designing your notebook for the laser rotation



# Illustrator website update

Once you have your final mini projects (keychain/vinyl) you can finish updating your “Illustrator” page. You should include these items on your page:

1. Description of what Illustrator is/does
2. Screenshots of your Illustrator files for the laser and your name/font for the vinyl cutter
3. Step by step instructions for using the laser with Screenshots/photos
4. Picture of your keychain cut out
5. Step by step instructions for applying a vinyl decal with photos
6. Picture of your vinyl decal placed on designer notebook
7. Summary paragraph of what you learned/accomplished in this introduction to Illustrator/Laser cutting/vinyl

IF YOU FINISH YOUR WEBPAGE – Start working on designing your notebook for the laser rotation: 2D laser cut and engrave cover for a notepad out of mat board. You must have both a cut process (Vector Cut – .0001 Red) and an engraved process (Raster engrave – Black/Grey). The notepad will be 4.25x5.5 in size. You will need to laser cut the front and back cover boards for your notepad.

# DAY 10 – Room 1113

## TO DO LIST FOR TODAY

### Webpages

- No slide shows
- Reminder of rubric on resources page
- Adding a link in Schoology to turn them in – PUBLISH!

How rotations work

What are the projects for each rotation

Webpage requirements

Design notebook for Laser Rotation



## How Rotations work

- Rotations consist of 4 days of work time
- The first three days are straight work/design/production time for students
- Day four is used as a transition day. Students should be using the transition day to:
  - Finish up production
  - Update their website
  - Update their Notebook
  - Start Working on their next Rotation
- Students who DO NOT finish work during their rotation time in class MUST come in during contact time to finish their assignments.
- Students must check in with Mrs. Proctor before starting production of their assignment.



# Individual 3D printing Assignment

## Assignment:

For your 3D printing assignment you must use a Design software to create one of the following items. MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section in your notebook titled “INDIVIDUAL 3D PRINTING ASSIGNMENT”

1. A decorative holder that successfully holds your cell phone (cord management optional)
2. An organizational device that neatly holds no less than:
  - a. 50 pennies
  - b. 40 nickels
  - c. 50 dimes
  - d. 40 quarters
3. A device that neatly holds 4 toothbrushes
4. A device that organizes a set of earbuds and attached cord





# Individual Laser Assignments

## Assignment:

For your laser assignment you must complete each of the following items. MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section in your notebook titled “INDIVIDUAL LASER ASSIGNMENT” and document the steps needed to complete the laser projects from start to finish.

1. 2D laser cut and engrave cover for a notepad out of mat board. You must have both a cut process and an engraved process. The notepad will be 4.25x5.5 in size. You will need to laser cut the front and back cover boards for your notepad. 20 pages inside the notebook/
2. Laser engrave a water bottle given to you by your instructor. The design should include both text and an image.
3. Laser cut a 3 Dimensional item that you found on Thingiverse or created yourself using Adobe Illustrator/Inventor.....These items must be signed off on by Mrs. Proctor and fit on one sheet of material no bigger than 18x32 (size of the laser bed. Keep in mind that we can scale and move files around to make them fit.....



# Individual Vinyl Assignment

## Assignment:

For your vinyl cutting assignment you must use a vector design software to create a multi color vinyl decal. MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section in your notebook titled “INDIVIDUAL VINYL CUTTING ASSIGNMENT” and document the steps needed to vinyl cut a decal from start to finish.

Requirements:

Must use at least three colors in your design

Must have a photo of your finished item on your website

Can be no larger than 12x12 inches in size

Must be applied to an actual item of YOUR OWN. Material will NOT be supplied by Mrs. Proctor!!!

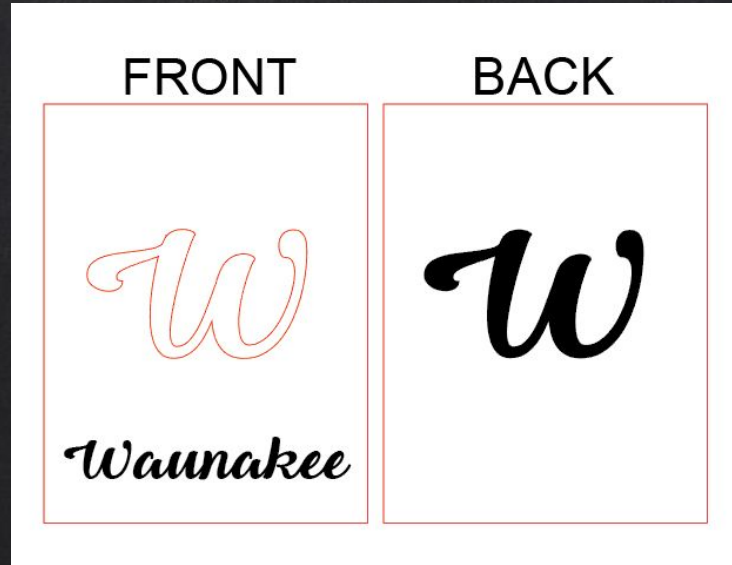


# Individual Assignment website Requirements

Now that you are working on your individual assignments you should include create a new page for each of your individual assignments on these pages you should include:

1. Full documentation from inception of the idea to creation of the final project
2. Sketches from your designer notebook
3. Step by step “recipe” of how you completed the assignment. This can be a combination of paragraphs and photos. I DO NOT need a step one, step two, step three type of narrative.
4. Screenshots showing your digital documents
5. Screenshots photos of you using the machines
6. Summary paragraph of what you learned in rotation

**YOU WILL ALSO BE REQUIRED TO WRITE A DAILY ENTRY IN YOUR DESIGNER NOTEBOOK TO SHOW DAILY PROGRESS!!!!**



2D laser cut and engrave cover for a notepad out of mat board. You must have both a cut process (red .0001) and an engraved process (black or grey) on the front and just the engrave process on the back. The notepad will be 4.25x5.5 in size. You will need to laser cut the front and back cover boards for your notepad. 20 pages need to be in the notebook.

# Rotation 1 Groups

**3D Printing Assignment-  
Middle Group**

**Laser Assignments-  
Window Group**

**Vinyl Assignment-  
Wall Group**





# First Day of Rotation 1 – Day 11

You should be doing the following:

- Read the individual slide for your current rotation assignment
- Create a new page for your assignment on your weebly page
- Formulating a plan on how to accomplish the rotation assignment
- sketching/working out your idea in your designer notebook
- Ask any questions you may have
- Start working
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation

Last 5 Minutes of class are clean up!



## Second Day of Rotation 1

You should be doing the following:

- Finish collecting any items that you need for your assignment
- Finish any “pre”search you may need for your assignment
- Start working on the actual design of your project using software
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation



## Third Day of Rotation 1

You should be doing the following:

- Create plan to finish up your projects (last day in class on these machines is next class)
- Start updating your website for your individual assignments
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation



## IMPORTANT- PLEASE READ

NOTEBOOKS WILL BE DUE TODAY AT THE END OF CLASS!!!!!!

ILLUSTRATOR/LASER/VINYL CUTTER WEBSITE WILL BE GRADED STARTING TOMORROW MORNING -  
YOU SHOULD BE USING THE GRADING RUBRIC ON THE WEBSITE.



# Final Day of Rotation 1

You should be doing the following:

- Finish up your projects (today is the last day in class on these machines)
- Complete updating your website for your individual assignments using the rubric
- Start working ahead on next rotation
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation





# INDIVIDUAL ASSIGNMENT WEBSITE REQUIREMENTS

Now that you are working on your individual assignments you should include create a new page for each of your individual assignments on these pages you should include:

1. Full documentation from inception of the idea to creation of the final project
2. Sketches or “pre”search from your designer notebook
3. Step by step narrative of how you completed the assignment in your own way. This can be a combination of paragraphs and photos. I DO NOT need a step one, step two, step three type of narrative necessarily but someone should be able to understand how you got from start to finish.
4. Screenshots showing your digital documents/files
5. Screenshots/ photos of you actually using the machines
6. Summary paragraph of what you learned/accomplished in this rotation

**YOU WILL ALSO BE REQUIRED TO WRITE A DAILY ENTRY IN YOUR DESIGNER NOTEBOOK TO SHOW DAILY PROGRESS!!!!**



## IMPORTANT- PLEASE READ

Rotation 1 web sites are due this Friday March 9th!  
There will also be a designer notebook check.

# Rotation 2 Groups 4B

**Vinyl Assignment**

**3D printing Assignment**

**Laser Assignments**



# First Day of Rotation 2

You should be doing the following:

- Read the individual slide for your current rotation assignment
- Create a new page for your assignment on your weebly page
- Formulating a plan on how to accomplish the rotation assignment
- sketching/working out your idea on paper in your designer notebook
- Ask any questions you may have
- Start working
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation
-



## IMPORTANT- PLEASE READ

Rotation 1 web sites are due this Friday March 9th!  
DO NOT plan to have in class time to work on them.  
There will also be a designer notebook check.

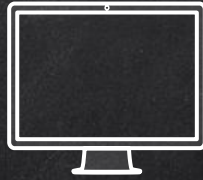




## Second Day of Rotation 2

You should be doing the following:

- Finish collecting any items that you need for your assignment
- Finish any “pre”search you may need for your assignment
- Start working on the actual design of your project using software
- Ask any questions you may have. If you have questions use your resources. You now have 5 other students in class that have worked on your assignment aside from Mrs. Proctor! These people can help too!
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation



## Third Day of Rotation 2

You should be doing the following:

- Create plan to finish up your projects (last day in class on these machines is next class)
- Start updating your website for your individual assignments
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation
-



## IMPORTANT- PLEASE READ

Rotation 2 Webpage Due on March 29th  
Take your screenshots, snipping tools and notebook  
home so you can complete the webpage over spring  
break! DO NOT wait until the last minute.



## Final Day of Rotation 2

You should be doing the following:

- Finish up your projects (today is the last day in class on these machines)
- Complete updating your website for your individual assignments (next slide)
- Start working ahead on next rotation
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation
-



# Individual Assignment website Requirements

Now that you are working on your individual assignments you should include create a new page for each of your individual assignments on these pages you should include:

1. Full documentation from inception of the idea to creation of the final project
2. Sketches from your designer notebook
3. Step by step “recipe” of how you completed the assignment. This can be a combination of paragraphs and photos. I DO NOT need a step one, step two, step three type of narrative.
4. Screenshots showing your digital documents
5. Screenshots photos of you using the machines
6. Summary paragraph of what you learned in rotation

**YOU WILL ALSO BE REQUIRED TO WRITE A DAILY ENTRY IN YOUR DESIGNER NOTEBOOK TO SHOW DAILY PROGRESS!!!!**





FEATURING  
**MIKE ROWE**

Don't Follow Your Passion

# Rotation 3 Groups 4B

**Laser Assignment**

**vinyl Assignment**

**3D printer Assignments**



# First Day of Rotation 3

You should be doing the following:

- Read the individual slide for your current rotation assignment
- Create a new page for your assignment on your weebly page
- Formulating a plan on how to accomplish the rotation assignment
- sketching/working out your idea on paper in your designer notebook
- Ask any questions you may have. If you have questions use your resources. You now have 5 other students in class that have worked on your assignment aside from Mrs. Proctor! These people can help too!
- Start working
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation



## IMPORTANT- PLEASE READ

Rotation 2 Webpage Due on THURSDAY

Take your screenshots, snipping tools and notebook home so you can complete the webpage before next class!

There will also be a designer notebook check.

END OF THE QUARTER IS 4/5/18



## Second Day of Rotation 3

You should be doing the following:

- Finish collecting any items that you need for your assignment
- Finish any “pre”search you may need for your assignment
- Start working on the actual design of your project using software
- Ask any questions you may have. If you have questions use your resources. You now have 5 other students in class that have worked on your assignment aside from Mrs. Proctor! These people can help too!
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation





## Third Day of Rotation 3

You should be doing the following:

- Create plan to finish up your projects (last day in class on these machines is next class)
- Start updating your website for your individual assignments
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation



## Final Day of Rotation 3

You should be doing the following:

- Finish up your projects (today is the last day in class on these machines)
- Complete updating your website for your individual assignments (next slide)
- Start working ahead on next rotation
- Ask any questions you may have
- Take Photos as you work
- Create daily entry in your notebook to document your daily work on this rotation

**WEBSITES FOR THIS ROTATION WILL  
BE DUE ON 11/20**



# Individual Assignment website Requirements

Now that you are working on your individual assignments you should include create a new page for each of your individual assignments on these pages you should include:

1. Full documentation from inception of the idea to creation of the final project
2. Sketches from your designer notebook
3. Step by step “recipe” of how you completed the assignment. This can be a combination of paragraphs and photos. I DO NOT need a step one, step two, step three type of narrative.
4. Screenshots showing your digital documents
5. Screenshots photos of you using the machines
6. Summary paragraph of what you learned in rotation

**YOU WILL ALSO BE REQUIRED TO WRITE A DAILY ENTRY IN YOUR DESIGNER NOTEBOOK TO SHOW DAILY PROGRESS!!!!**



## MOVING FORWARD

- Today Starts the CNC Router and Mill Rotations
- You will have until the end of the semester to finish your projects and web pages (CNC Router and CNC Mill)
- Each person will have a project on each machine
- The next three classes will be work time on these two rotations
  - All work will be done in Inventor/Fusion 360
- Starting in a few weeks we will talk about the final project

YOU GUYS ARE DOING AWESOME!!!!!!

**WEBSITES FOR THIS ROTATION WILL BE  
DUE ON JAN 3rd**



## CNC Mill

### Assignment:

For your CNC Mill assignment you must complete each of the following items. MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section in your notebook titled “INDIVIDUAL CNC MILL ASSIGNMENT” and document the steps needed create a small maze from start to finish.

1. Draw the part “Brake Bracket” using Inventor and upload to Fusion 360
2. Use Fusion 360 to generate tool paths and G-code to cut out this part. You will be required to use two different processes and tools to complete this part.
3. Use the CNC Mill to complete a mock-up of the Brake Bracket out of blue/pink foam





## Assignment:

# CNC ROUTER MAZE

For your CNC Router assignment you must complete each of the following items. MAKE SURE TO INCLUDE ANY “PRE”SEARCH or **RESEARCH IN YOUR DESIGNER NOTEBOOK!** You will need to start a new section in your notebook titled “INDIVIDUAL CNC ROUTER ASSIGNMENT” and document the steps needed create a small maze from start to finish.

1. Create a maze **no bigger than 8.5x11 inches**. These mazes can be any shape as long as it fits on the dimensions given.
2. Use Inventor to create a 3D maze. These mazes should have a **3/8 inch border around the perimeter** and have **5/16 inch wide, 1/4 inch deep channels** for the ball to travel. The material will be  $\frac{3}{4}$  inch thick foam to start. There must be a definite start location and finish location.
3. You will use the CNC router to cut out the entire maze including channels, start/finish and perimeter





**CAM!!!!!!!**





CAM!!!!!!!





# Final Project

## Assignment:

For your final IDEA assignment you must complete the following challenge: With the clock mechanism given to you by Mrs. Proctor, make a clock that uses at least 3 of the machines in the Innovation Center.

MAKE SURE TO INCLUDE ANY “PRE-WORK or RESEARCH IN YOUR DESIGNER NOTEBOOK! You will need to start a new section in your notebook titled “FINAL PROJECT” and document the steps needed in completing this assignment from start to finish. You may use any of the equipment in the Innovation Center and woods lab if you have had training on them.





# Final Project

## Required Items:

1. Complete documentation in your Design Notebook showing daily entries, sketches, research and steps on completion including all works cited.
2. A web page on your Weebly site showing the entire project
3. The use of at least 3 machines (not including poster printer) in the Innovation center.
4. 1-2 prototypes depending on the size. Mrs. Proctor will determine how many items you will have to make.

Your project should be a combination of items that you can produce using the equipment in the lab. Mrs. Proctor will not be purchasing any “materials” for you but you will not be charged for things like vinyl, laser time, 3D printer filament or scrap materials available in the lab. BEFORE YOU START YOU MUST GET THE OK FROM MRS. PROCTOR. You may work as individuals or in groups of 2 people and your project must be proportionate to the amount of people in your group!





Please kindly note, 2 reasons  
may cause the clock movement  
stop moving or the accuracy



1. Please don't install the  
brass hex nut too tight

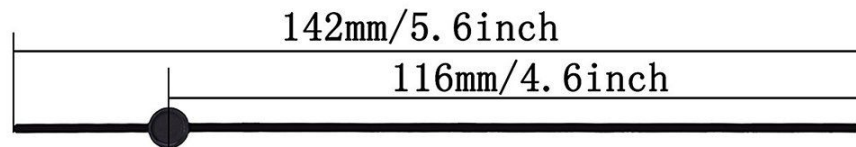
2. You don't put second hand in right position,  
please kindly help to check if the second hand  
has been pressed down hard



14mm  
(3/5inch)

20mm  
(4/5inch)

suitable for 8-11mm(3/10-11/25inch)  
thickness clock panel





# Looking Forward to June

DUE DATES FOR THE REMAINING ASSIGNMENTS:

**May 24th** - Your CNC Router and CNC Mill web pages are due. You will have to due a separate web page for each assignment because they are different set-ups.

**May 31st** - Final Project web page is due. THERE WILL BE NO WORK TIME DURING FINAL EXAM WEEK. You will be expected to come in during your final exam time and help clean up the lab and machines for the summer.



<https://willbrezenski.weebly.com/final-project.html>

<https://cameronewerner.weebly.com/rrr-project.html>

<https://elizabethsidea.weebly.com/final-project.html>

<https://margot-ideas.weebly.com/final-project.html>

<https://mandyidea.weebly.com/final-project.html>

<https://iangrau.weebly.com/final-project.html>

<https://ideatjade.weebly.com/individual-project.html>

<https://rmerk.weebly.com/final-project.html>

<https://lmilleridea.weebly.com/final-project.html>

<https://codymakiidea.weebly.com/final-project.html>

<https://ideajacobelvewaunakeeinnovation.weebly.com/final-project.html>





## 5/30/18 – Finishing up

- Seniors All final projects and late assignments sheets will be graded at the end of the day on Friday for final input into the gradebook.
- Seniors please take the end of class survey here:
- Seniors you need to do an end of year clean-up job from the next slide (must complete before you leave today).
- Underclassmen – Your final projects and late work must be completed before the end of class on Friday.
- ALL NOTEBOOKS Will be graded and ready to be picked up by the end of the day on Monday. Any notebooks left on Friday of Final Exam week will be discarded.
- Underclassmen your final exam time is MANDATORY and will occur on Thursday June 7th at 2:05pm. You will receive a grade for showing up and helping get the lab ready for summer.
- Take home ALL projects and materials you are not using. Anything left will be tossed

[https://tinyurl.com/  
whsctesurvey](https://tinyurl.com/whsctesurvey)