

Engineering Portfolio

Name:

Team:

Quarter:

2013-2014

Mr. Brennan & Mrs. Richardson

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Think about it! Who is an engineer? What does an engineer do? What does an engineer look like?
In the space provided below draw a picture of an engineer at work (put them in a setting).

In complete sentences please explain why you chose to draw your engineer the way you did:

Technology vs. Science



My Predictions:

Technology is the study of...

An example of technology is...

Science is the Study of...

An example of technology is...

Engineering Notes:

Technology is the study of...

An example of technology is...

Science is the Study of...

An example of technology is...

An invention is...

An innovation is...

✓

Name: _____

Team: _____

Invention to Innovation

Directions: Think about an early invention. How has that invention changed over time? In the table below sketch the earliest version of the invention you can remember and then five innovated versions of that product. Make any notes on the bottom of the table that you can about how the product has improved.

Sketches of your Invention and Innovated Designs					
Notes about each Innovated Design					

4

FORM	LIGHT & SHADOW
SPACE	MATERIALS & TEXTURE
LINE	COLOR

In the spaces provided below sketch an example for each of the Elements of Design.

Word	Definition
	The shape, outline, or structure of an object or product.
	By adding this element of design you can create a sense of depth.
	The six primary components in the creation of a design are the
	Used to separate and connect elements.
	Provides definition, interest, variety and change. Can also give a sense of different feelings.
	Simulated when combining patterns and colors
	Can be straight, curved, horizontal, vertical or diagonal. Produces a sense of movement.
	To create, fashion, execute, or construct according to plan.

Please complete during the presentation. Write the word that matches the definition.

Elements of Design Notes

Name: _____ Team: _____

Elements of Design

“Name Project”

As a designer, you are responsible to create a unique piece of artwork. You will be using your “first” name to do this design. Included in your design, you will use the six elements of design:

Line, Form, Color, Space, Materials/Texture and Light/Shadow. In your design, you will need to incorporate one fruit as a letter, one type of transportation as a letter, one type of animal, and one manmade structure/building as another letter. The rest of the letters are free for you to be as creative as you would like. In your name, you must also include at least three different examples of the six elements of design.

Have Fun!!

Name: _____ Team: _____

Elements of Design "Name Project" Checklist and Reflection

- I have created a unique piece of artwork using my name.
- I have included all 6 Elements of Design (explain how in the table below)

Elements of Design (EOD)	<u>Three</u> examples of how I have used each of the Elements of Design in my Name Project.
Line	1. 2. 3.
Form	1. 2. 3.
Color	1. 2. 3.
Space	1. 2. 3.
Materials and Texture	1. 2. 3.
Light and Shadow	1. 2. 3.

I have worked neatly, carefully and my time and effort shows in my work.

- I have drawn my name to fill the piece of paper.
 - Letter: _____ Building: _____
- I have used one type of Structure/Building as a letter.
 - Letter: _____ Transportation: _____
- I have used one type of Transportation as a letter.
 - Letter: _____ Animal: _____
- I have used one Type of Animal as a letter.
 - Letter: _____ Fruit: _____
- I have used one type of Fruit as a letter.

Complete the following prompts:

My favorite part of my name design is...

My least favorite part of my name design is...

If I could do this project again I would do _____ differently because...

I think that the Elements of Design are important in design and engineering because...

Thumbnail Sketching Notes

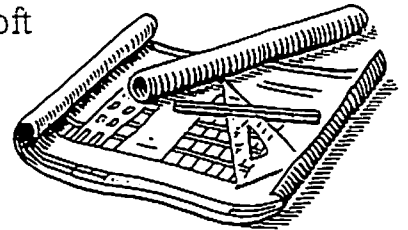


Name: _____ Team: _____

Designer Thumbnail Challenge

Directions:

1. Read each of the designer challenges.
2. Sketch and shade thumbnails for the products you will be designing— sketch from various views (front, back, sides, top, bottom).
3. If necessary enlarge certain parts of your sketch to show detail.
4. Label and include side notes that explain how your product works.
5. Pick one view from each challenge to create on Microsoft PowerPoint using the drawing tools.



Criteria:

- 5 Thumbnail sketches per challenge
- Sketches should be done in pencil (black and white)
- Shaded where appropriate
- Sketches are labeled

Challenges

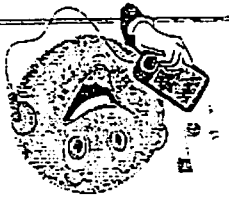
- 1) You have been asked by a modern-day appliance company, **Squirts**, to design a shower head that has adjustable settings, is 5" in diameter, and is "creative and trendy."



2) You have been contracted by **Gums**, to design a toothbrush that cleans teeth, massages gums, and prevents cavities. Your toothbrush may be hand, battery, or electricity operated.



3) **GADGETZ**, an electronic manufacturing company, has asked you to create an innovative and stylish mp3 player. The mp3 player must have a screen and controls to switch from song to song. It must also have a headphone port and charging capabilities.



TICTEMP

Directions: When viewing the PowerPoint presentation fill in the appropriate information

TECHNOLOGICAL RESOURCES

1. What are the seven technological resources?

TIME

2. It takes time to _____ products, and _____

3. Early people measured time by _____ and _____

INFORMATION

4. Information can be found in many places, such _____

5. Information can also help us determine the best way to use available _____

CAPITAL

6. Capital= _____

Technological Resources Shoe Application

Now that you have learned about the seven technological resources (TICTEMP), lets think about a product that we are all familiar with...shoes! Take a look at the shoes you are wearing. What resources are needed in order to design and manufacture your shoes? Fill in the table below.

Name of Shoes: _____

T Time	I Information	C Capital	T Tools & Machines	E Energy	M Materials	P People



Name: _____ Team: _____

TICTEMP Activity

Directions: 1. In your groups think about all of the resources used in creating the five different products below.

2. Next to the resource indicate which category it belongs to:

T=time, I=Information, C=capital, TM=tools and machines, E=energy, M=materials, P=people.

Toy Car	Pencil	Blueberry Eggo

T=time, I=Information, C=capital, TM=tools and machines, E=energy, M=materials, P=people.

Computer	Slice of Pizza	REFLECTION QUESTION
		Are all 7 technological resources (TICTEMP) necessary for all products? Why or why not?

THE DESIGN PROCESS

- A logical sequence of steps to develop the best solution to a specific problem.
- An engineering activity that takes a concept and makes it a reality.
- A series of stages and check-points where each step in the process can be reviewed and analyzed.

Vocabulary

Design Challenge- States the problem and lists the specifications for the design.

Informed Design- Method of making choices and then coming back to refine or revise those choices at any point in the process as often as necessary.

Requirements- What your design has to have or be able to do according to the challenge. The solution your design must fulfill. Your design goals.

Constraints- Limitations imposed on the design (often related to resources TICTEMP).

Brainstorming- Coming up with alternative solutions.

Prototype- A full scale, fully operational version of the solution.

The Design Process

Write the steps of the design process below:

1. _____

2. _____

3. _____

4. _____

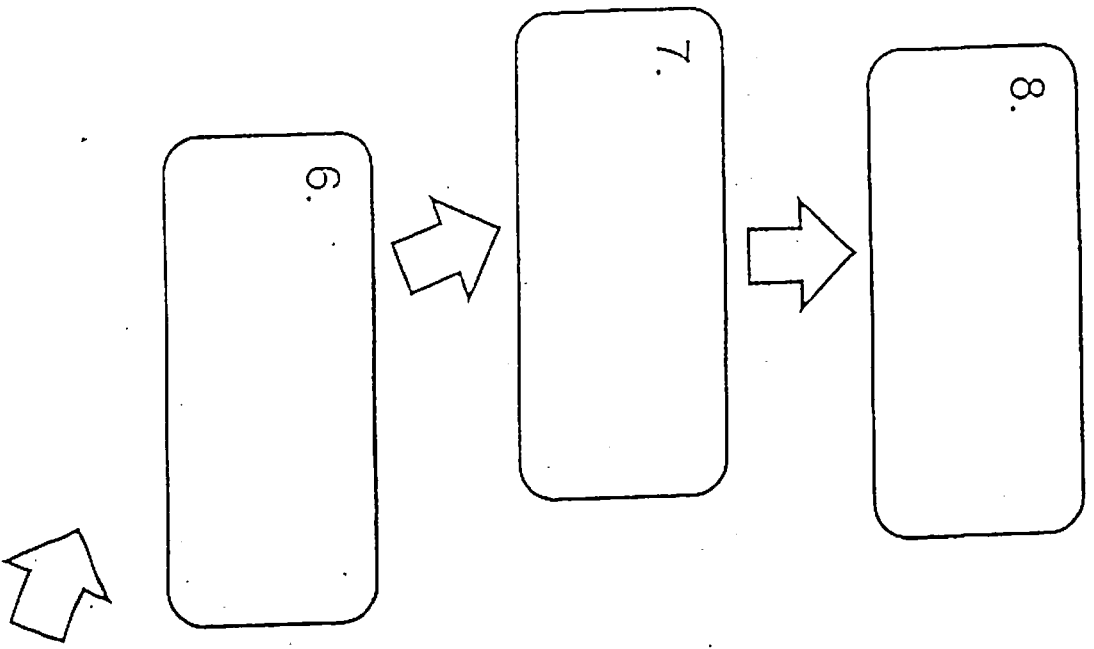
5. _____

6. _____

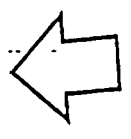
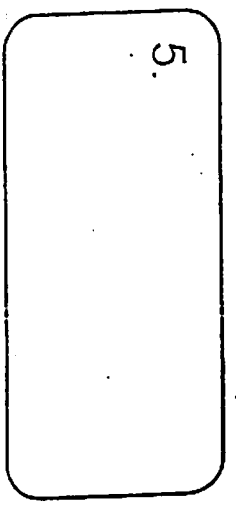
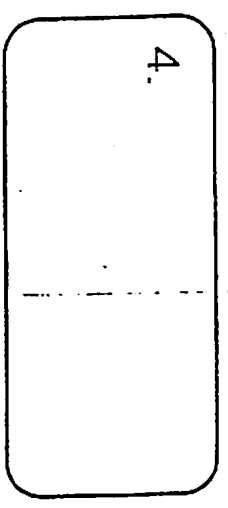
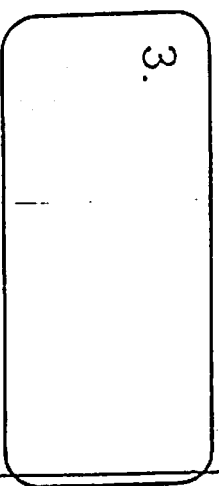
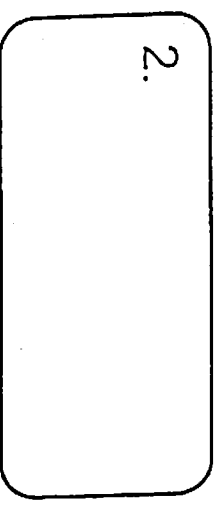
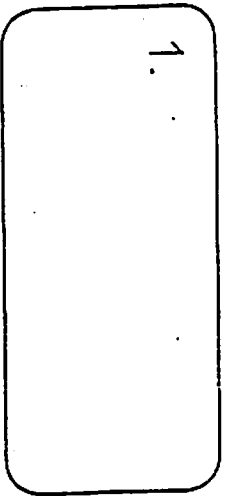
7. _____

8. _____

• Re-enter the design cycle at any step to revise product if necessary!



The Engineering Design Process Map



Sports Drink Campaign

You have just been hired by a Florida beverage company to design and market their latest sports drink called, *Sonic-Tonic*. This product has been created to enhance an athlete's performance by 25%-50%. It has a sharp grape flavor that tingles the tongue and warms the body.

Your challenge is to design the label, bottle shape and a slogan (catch phrase) to sell the product to athletes, as well as, to the everyday consumer.

Good Luck



Brainstorm—Think of a term, phrase, or idea related to the topic of engineering for each letter of the alphabet. Can you name more than one? Put your engineering thinking caps on!

Engineering Alphabet

Name: _____ Team: _____

_____	A-
_____	B-
_____	C-
_____	D-
_____	E-
_____	F-
_____	G-
_____	H-
_____	I-
_____	J-
_____	K-
_____	L-
_____	M-
_____	N-
_____	O-
_____	P-
_____	Q-
_____	R-
_____	S-
_____	T-
_____	U-
_____	V-
_____	W-
_____	X-
_____	Y-