IED Semester Exam Review	Name	
Date and time of my exam	Per	Date

You must make a cheat sheet that is one sided & hand written 8.5"x11". You will be given a clean formula sheet for the test. You should make this as you study. You will need to have your calculator for the test also. The following lists cover most of the topics on the Exam. It's not exhaustive. Remember the PowerPoints for all units are in myPLTW.org.

#### Unit 1-Design Process:

-Border

-Sheet

	-6 steps		-Brains	torm		-Models		-Prototype/	'Mock Up	
	-Design Brief		-Engine	er's Note	ebook	-Portfolio		-Technical F	Report	
	-Deliverables		-Constr	aints		-Decision Matı	rix			
Unit 2	-Technical Ske	tching o	and Drav	ving:						
	-Perspective		-Explod	led		-Assembly		-Oblique		
	-Isometric		- # of r	needed vi	iews	-Multiview		-Orthograp	hic	
	-Best front vie	w	-Annota	ated Ske <sup>.</sup>	tch	-Detailed Drav	wing			
Unit 3-Measurement and Statistics:										
	-SI and English	n Units	-Estimo	iting Mea	isures	-Convert withi	n	-Convert be	tween	
	-Dimensioning	imensioning rules -Size and Location			-Mean, Mediar	n, Mode,	Range			
	-Standard Dev	iation	- + or -	sigma w/	'norma	l distributions		-Precision &	Accuracy	
	-Line Types:	-Cente	r	-	Hidde	n	-Objec	t	-Leader	
		-Const	ruction	-	Exten	sion	-Dimen	sion	-Hole &	Thread
		-Arrow	heads	-	Cente	r Mark				
Unit 4	-Modeling Skill	5:								
	Basic Inventor	Skills:								
	-Browser	-Ribbo	n	-Drawing	9	-Assembly	-Part	-Pre	sentation	
	-Dimensioning	Guidelin	es	-Constra	uints (n	nate, angle, etc	)			
Parts o	of a Drawing st	neet:								
	-Balloons		-Projec	ted View	S	-Base Views		-Parts List		-Title Block

-Dimensions

#### Applied Stats & Unit Conversions (Unit 3)

# **Applied Statistics** The following is from the 2012 Engineering Formula Sheet : 1 If two values occur with maximum frequency the data is If three or more values occur with maximum frequency the data is \_\_\_\_\_ List the following data sets as "one-mode", bi-modal, or multi-modal THEN EXPLAIN why a) 24, 24.5, 26, 29, 30, 30, 30, 33.8, 40, 40, 40, 45, 46, 47, 47 50 Explain why: b) 6, 7, 9, 10, 10, 11, 17, 18, 19, 19, 21. 21.5, 24, 24, 27, 30 \_\_\_\_\_ Explain why: c) 117, 117, 123, 125, 125, 125, 128, 128, 130, 131, 133, 133 Explain why: 2 a). The results of a 40-point Biology Quiz from 14 students is 22, 25, 25, 27, 28, 32, 33, 34, 34, 34, 35, 36, 36, 36, i). Find the Mean, Median, Mode and Range Mean (round to hundredth): Median: Mode: Classify the data as "one-mode", bi-modal, or multi-modal \_\_\_\_\_ Range: ii). The mean from this data (from the question above) should be 31.21

Since this was a 40-point quiz what percent score is the mean?

<sup>3</sup> The following conversions may need use of your PLTW Formula Sheet. Show work, round answers to nearest hundredth if applicable, include units.

- a) Convert 2.5 million deciliters into hectoliters
- b) One of the weights in the Weight Room says "4.54 kg" Find how many ounces this is.
- c) Find the perimeter of the following rectangle give your answer in centimeters



d) One Gigagram is how many milligrams?

## Line Conventions:



1-center line 2-object line 3-hidden line 4-dimension line 5-leader line 6-extension line

Line Precedence: Object>Hidden>Center>Cutting Plane Line>all others

### Degrees of Freedom:

A component floating in space has six degrees of freedom:

- 3 rotations around the X, Y, and Z axes.
- 3 linear translations along the X, Y, and Z axes.



### **Physical Properties:**

- volume-refers to the amount of space (design a 22 ounce bottle) (packaging-how big does the box need to be?)
- mass-refers to the quantity of matter in an object
- weight-is the force of gravity acting on an object (shipping weight limit)
- weight density-is an object's weight per unit volume (sinks or floats)
- surface area-the sum of all the areas of the faces of a three-dimensional solid (paint or powder coat)
- centroid (center of gravity) [something keeps tipping over]

Visual Design Elements	Visual Design Principles
• Line	Balance
Color	Rhythm
<ul> <li>Form/Shape</li> </ul>	<ul> <li>Emphasis</li> </ul>
Space	<ul> <li>Proportion and scale</li> </ul>
<ul> <li>Texture</li> </ul>	Unity
Value	

#### Words to be aware of:

Gantt Chart (A time and activity bar chart that is used for planning, managing, and controlling major programs that have a distinct beginning and end.)

Virtual Teams (Groups of people who primarily interact electronically)

axial mate ( a mate constraint applied between an axis of a part and the z axis)

auxiliary (slanted)

section (hidden interior)

hatch or section lines (diagonal lines that show internal material)

construction lines (Thin lines that serve as guides while sketching or drawing.)

histogram (vertical bar graph)

fluid power (Energy transmitted and controlled by means of a pressurized fluid, either liquid or gas.)

## Make a Model or Prototype

Mock Up: Also referred to as an Appearance Model. A model or replica of a machine or structure for instructional or experimental purposes.

Prototype: A full-scale working model used to test a design concept by making actual observations and necessary adjustments.

**Reverse engineering** (RE) is the process of taking something apart and analyzing its workings in detail, usually with the intention of understanding its function.

Stages of RE:

- Visual Analysis (Visual Design Elements and Principles)
- Functional Analysis (the product's purpose is identified; determine how the product functions; the system's inputs and outputs are listed)
- Structural Analysis (materials used; fastening methods)

#### Holes

Holes should be dimensioned using hole notes Holes are specified with numbers and symbols.

Ø Hole diameter

▼ Hole depth

Counterbore/Spotface diameter

Countersink hole diameter

#### Reading a hole note:

Ø0.25 ∓ 0.75 ∟ Ø0.50 ∓ 0.25

The Hole Diameter is .25" and will be drilled .75" deep. The Hole will be Counterbored to a .50"diameter and to a depth of .25"