Hello!

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What is filtering/evaluation

Systematic process to figure out which ideas are the best

Attempt to reduce subjectivity and increase objectivity

Easy way to weigh options without building them first

Quick Recap of How Might We... (HMWs)

Main purpose of goal setting

Serves as the starting point for idea generation

You should have some from last week

What is a Concept Sketch

Quick way to show your idea with a 3D drawing to better communicate your thinking to teammates

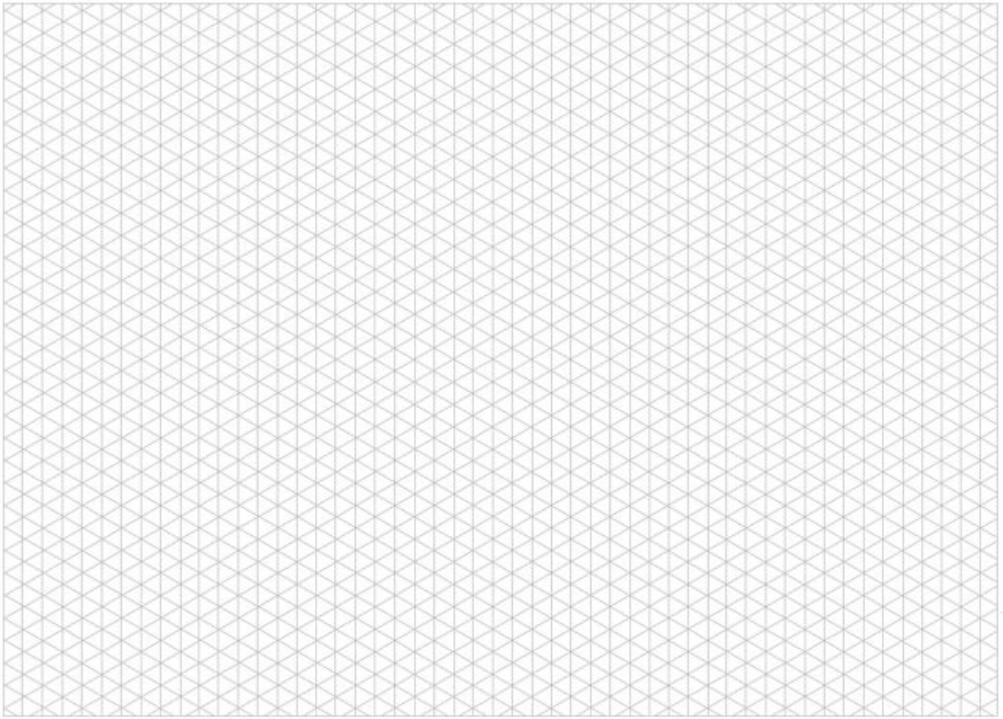
Generate disposable ideas quickly

HMW → concept sketch is the systematic way to get all options on the table

Isometric Paper

This is where most professional sketches are done

Easy to make isometric view drawings and other views with this paper



Isometric View

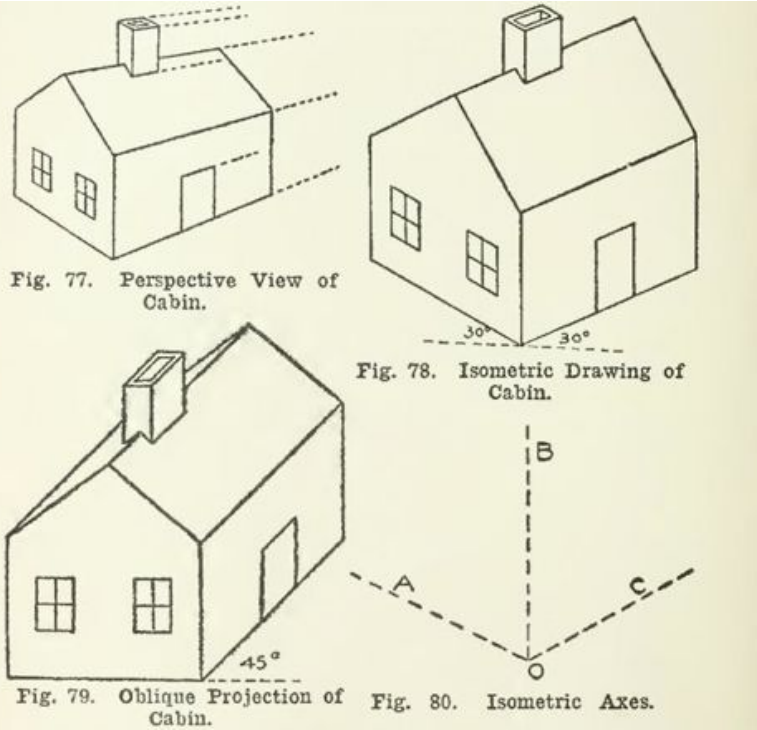
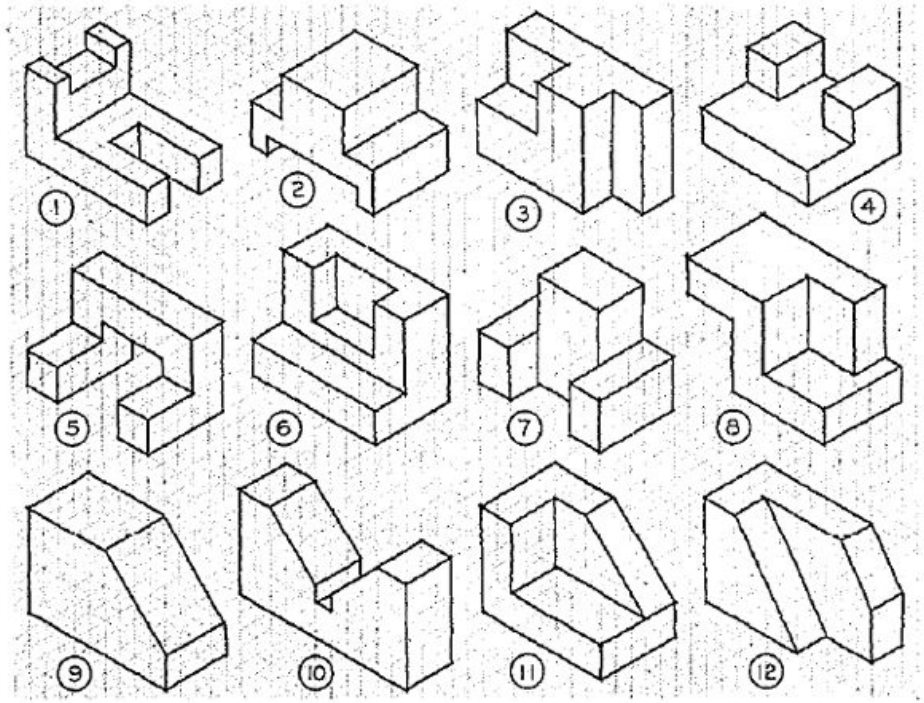


Fig. 77. Perspective View of Cabin.

Fig. 78. Isometric Drawing of Cabin.

Fig. 79. Oblique Projection of Cabin.

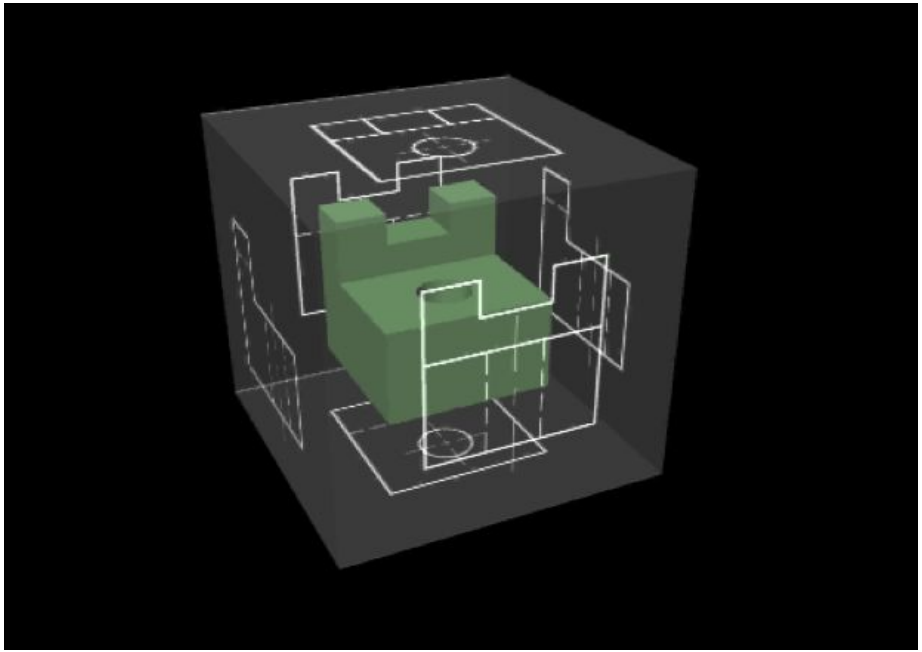
Fig. 80. Isometric Axes.



Glass Box Concept

Pretend that there is a glass box around your design

Draw the least number of views needed to get the best picture of the design inside the glass box



Orthographic Projection

Three Angle Projection:

1) Top
2) Front
3) Right

- Included with the isometric view

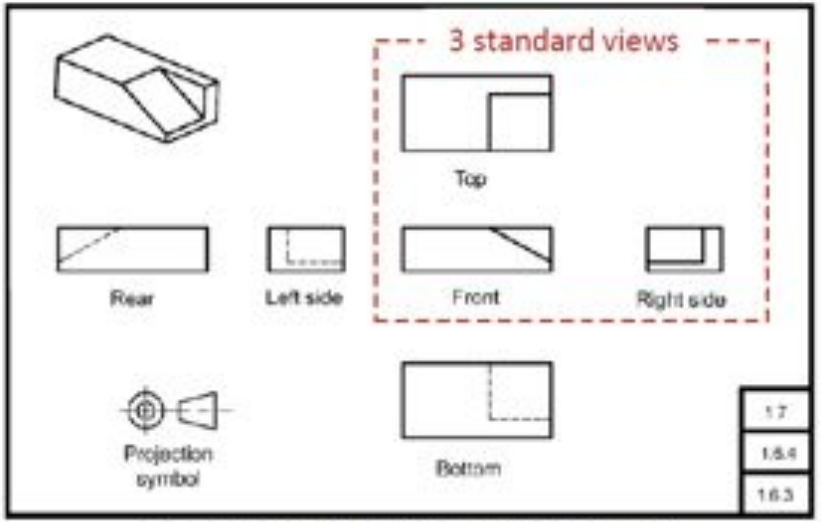


Fig. 4 Third Angle Projection Standard Arrangement of the Six Principal Orthographic Views

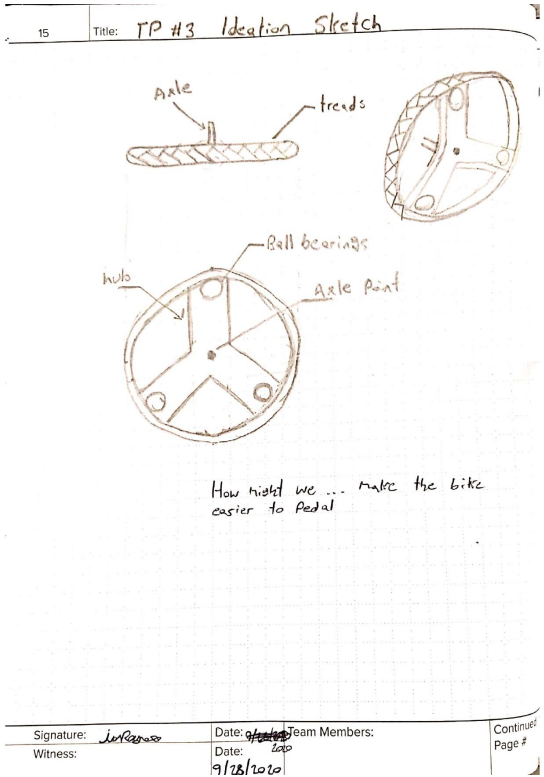
Characteristics of a Concept Sketch

1) Be on a single piece of paper
2) Have multiple views
    a) Isometric, left, right, top, bottom, etc
3) Labeled with the HMW it aims to address
4) Annotations of 1-5 words
5) Signed and dated
    a) For intellectual property's sake
6) Keep it simple and clear
7) Include reference objects for scale if necessary

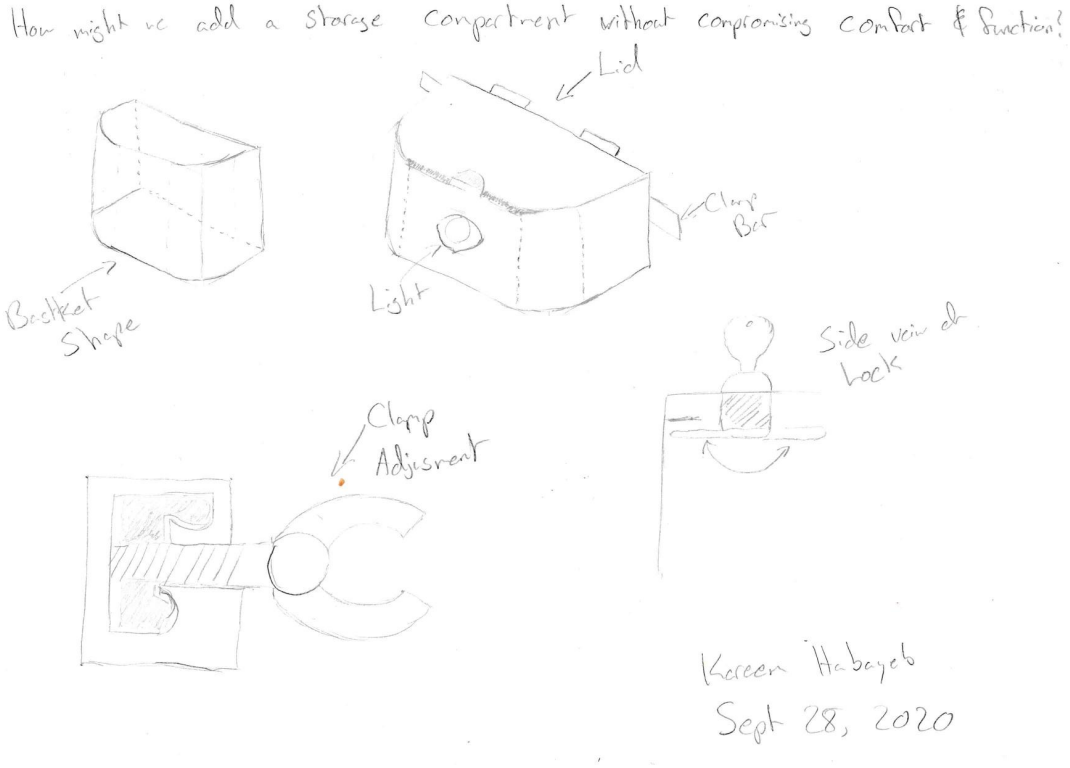
Today's Example: Bicycles

1) Defined User: Those who use a bike for transportation rather than comfort
2) How might we …
    a) make the bike more secure and less vulnerable to theft?
    b) make the bike easier to pedal?
    c) add more storage without sacrificing comfort and function?
    d) make the ride a more comfortable experience?

Examples of Concept Sketches



Examples of Concept Sketches



What is a Product Design Specification (PDS)

A PDS is structured document that has all the requirements of all aspects of an design to create a good and successful product

Very important in setting standards that all departments can meet

It’s a reference document for the design

Created at the beginning of the design but evolves as you go through the process

Product Design Specification (PDS)

1) Performance
2) Environment
3) Service Life
4) Maintenance
5) Target Costs
6) Competition
7) Shipping
8) Product Volume (Quantity)
9) Packing
10) Manufacturing Facility
11) Size
12) Weight
13) Aesthetics and Finish
14) Materials
15) Product Life Span
16) Standards, Specifications, and Legal Aspects
17) Ergonomics
18) Customer
19) Quality and Reliability
20) Shelf Life
21) Processes
22) Timescales
23) Testing
24) Safety
25) Company Constraints
26) Market Constraints
27) Patents, Literature, and Product Data
28) Political and Social Implications
29) Disposal

Example of PDS

1. Performance
    a. Should be able to hold a load of 300 lbs.
    b. Attachments should not make the bike slower
    c. Allows for the user to have a comfortable riding experience without exerting too much energy

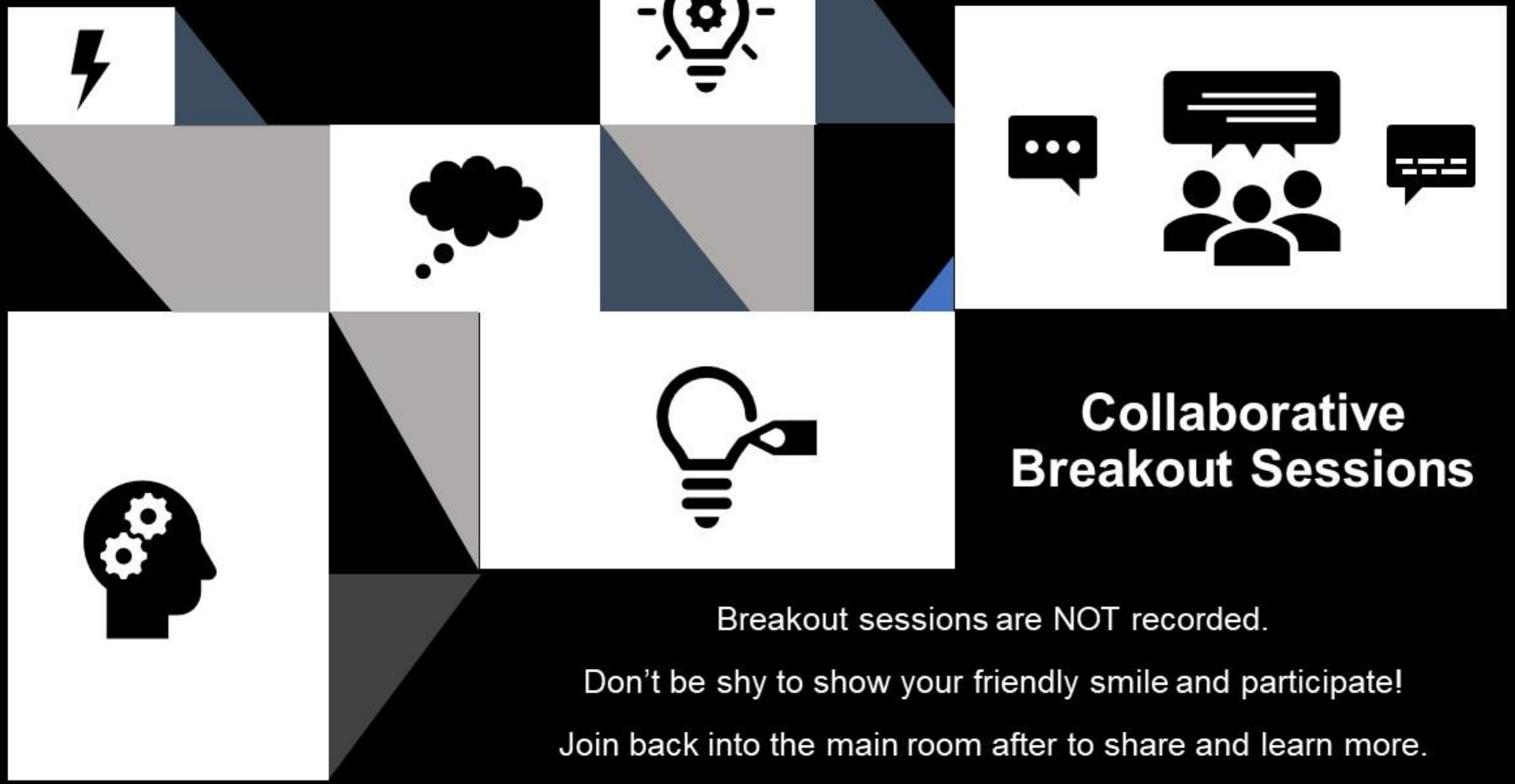
2. Weight
    a. Total weight of the bike with attachments should be about 25 pounds

Your Task - Breakout Rooms

Create a list (in order) of the top ten most important Product Design Specifications for the design of an improved bike

You don’t really need to have a specific design in mind, just the overall vision of a better bike

This step is important in prioritizing your goals



Collaborative Breakout Sessions

Breakout sessions are NOT recorded.

Don’t be shy to show your friendly smile and participate!

Join back into the main room after to share and learn more.

Breakout

We'll have a couple people share what points they thought were important to the design of the product

Unweighted Evaluation Matrix

Pros: Equally looks at all characteristics of a design to decide which is best

Cons: Not all characteristics are born equal, some are more important than others and varies design to design

What is a Pugh Matrix

An alternative method (weighted one) of comparing different designs to a datum (AKA one that already exists or one of your own)

It’s also known as controlled convergence

Steps to a Pugh Matrix

1) Develop concept sketches
2) Create a table (matrix) and the list the concepts to be compared on the top of the table
3) List important customer criteria down the left of the table
    a) Often taken from the PDS

Steps to a Pugh Matrix Cont.

4) Select a datum (an existing design or one of our own)

5) Compare each design with the datum using:

+ = better than, costs less than, less prone to, etc

- = worse than, more expensive than, more difficult than, etc.

S = more or less than same as the datum, ambiguity

6) Total the scores and examine the ones that have good strengths and acceptable weaknesses

7) If no design stands out, change the datum and run it again

Criteria (PDS Selection)	Weight	DATUM (Regular Bike)	Lock Concept	Basket Concept	Seat Concept	Wheel Concept
Processes	5		-	-	-	-
Product Life	2		+	S	S	-
Maintenance	4		-	S	-	S
Material	3		-	-	-	-
Safety	3		+	+	+	S
Performance	4	D	+	+	+	+
Environment	3	A	S	-	-	S
Reliability	3	T	+	+	+	+
Target Cost	2	U	-	-	-	S
Size	1	M	S	-	-	S
Sum			+4 -4	+3 -5	+3 -6	2+ 3 -

Concept Selection: Lock Concept

Thank You!