

**Week 1 – Lecture  
Conceptual Design**

# Outline

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- Elements of Product Design
- Market Demands and Challenges
- Product Lifecycle Phases
- Conceptual Design Phase
- Digital Conceptual Sketching
- Autodesk SketchBook Designer
- Automotive Seat Project Introduction

# Product Design

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# Products are Always Improving

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# Defining Design

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- “Good design is good business.”  
Thomas Watson, Jr., President, IBM
- “Good design is good citizenship.”  
“Milton Glaser, Designer”
- “Design is the fundamental soul of a man-made creation that ends up expressing itself in successive outer layers of the product or service. Design is not just what it looks like and feels like. Design is how it works.”  
Steve Jobs, CEO, Apple

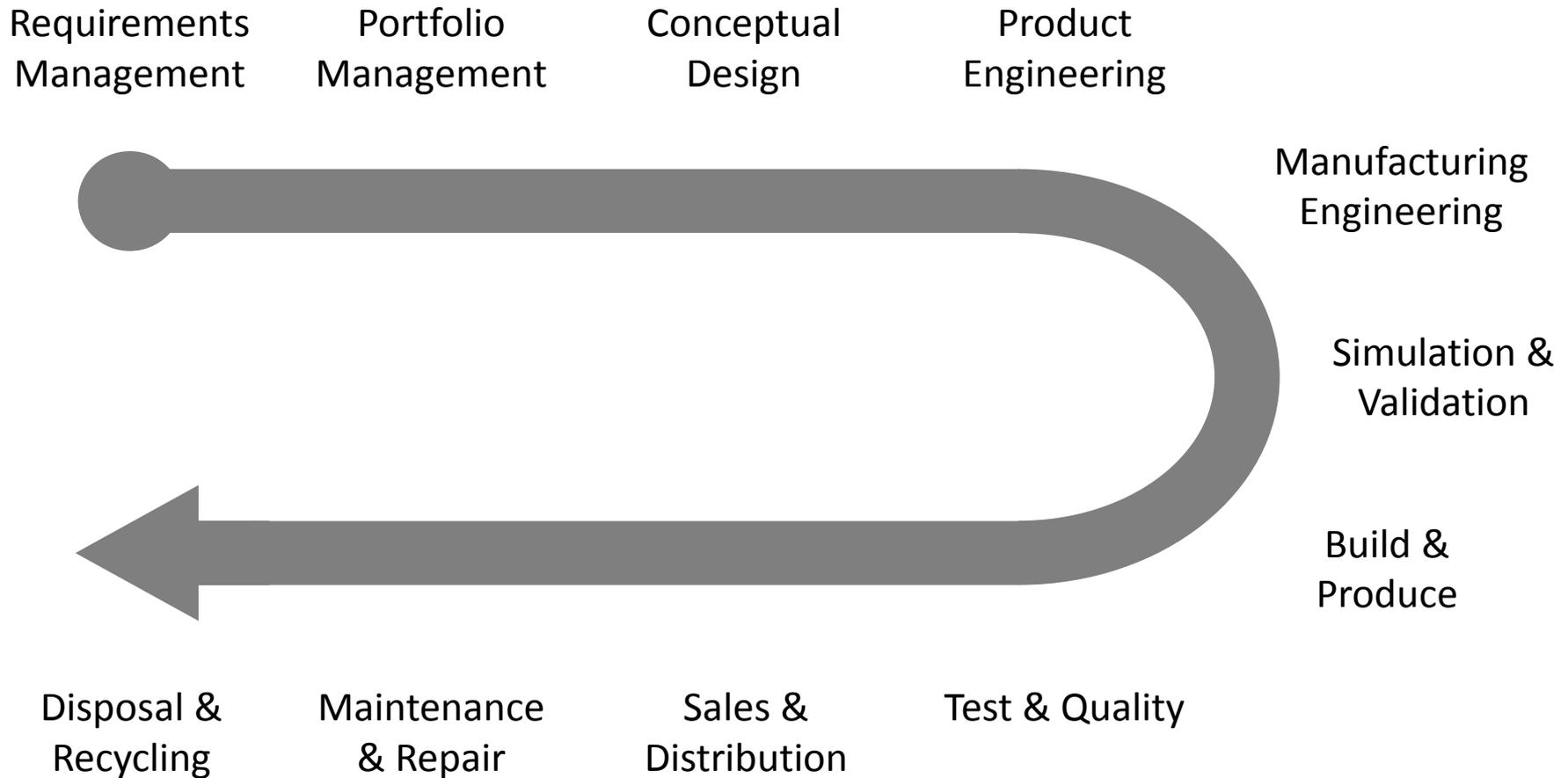
# Product Design Challenges

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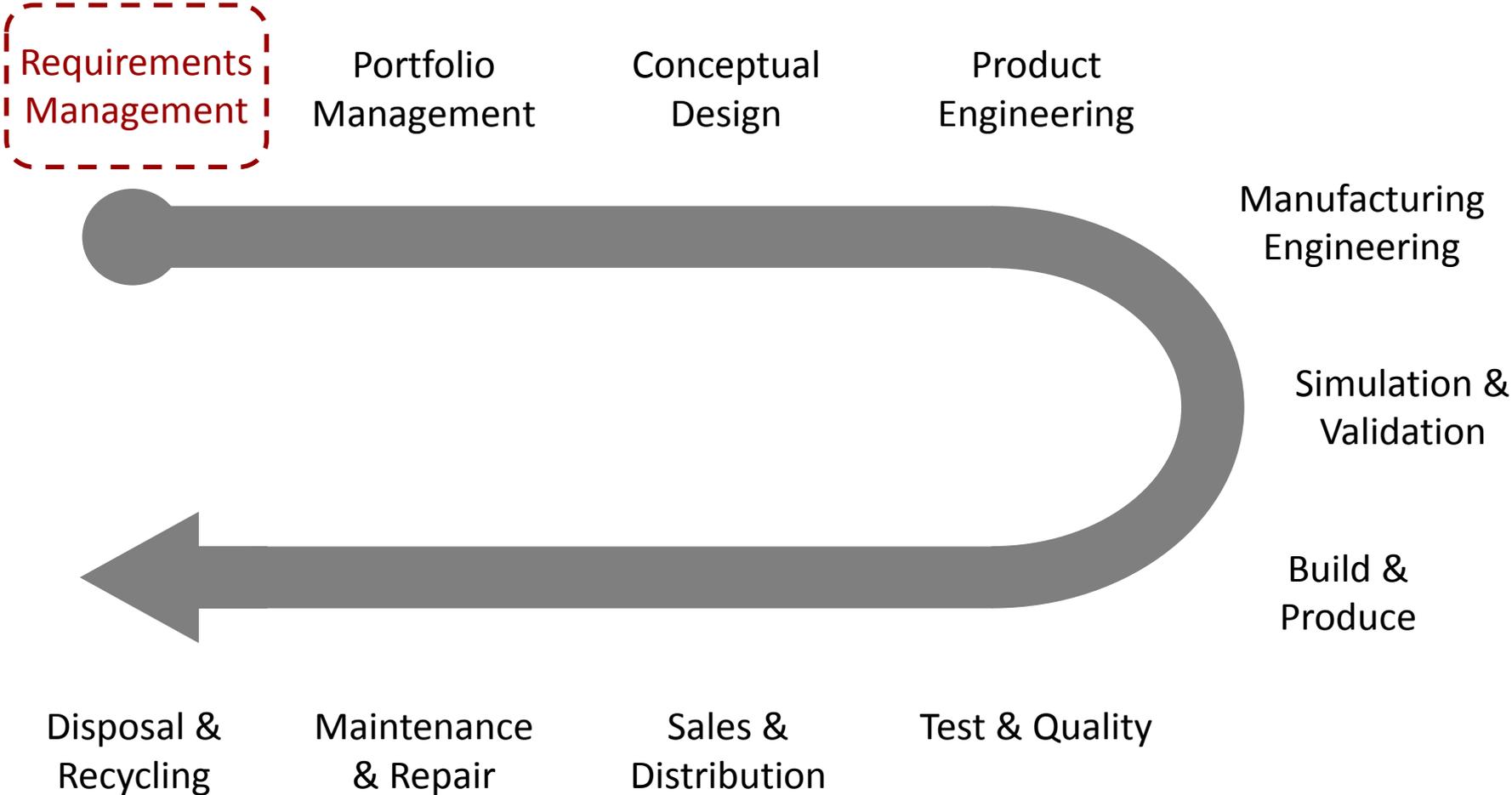
- High Quality
- Low Cost
- Shorter time-to-market
- Features & configurations
- Customized / personalized
- Green / sustainability / human right



# Product Lifecycle



# Product Lifecycle



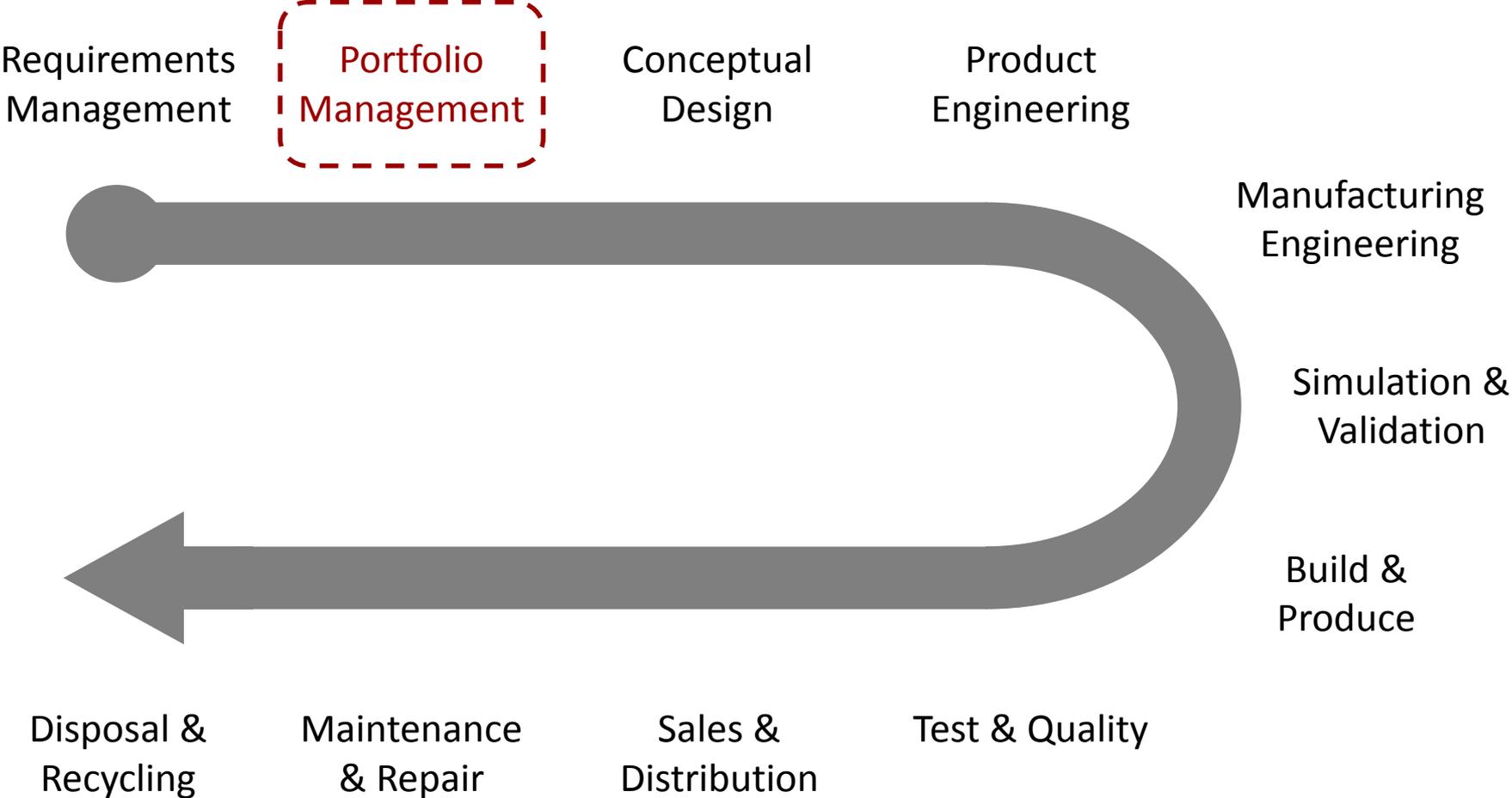
# Requirements Management

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The capturing, management, and tracking of all product requirements to ensure alignment for market success and reduced risk.

- Integration of requirements throughout the lifecycle
- Captured customer input and requirements
- Relation of final results to requirements
- Provides audit trail documentation

# Product Lifecycle



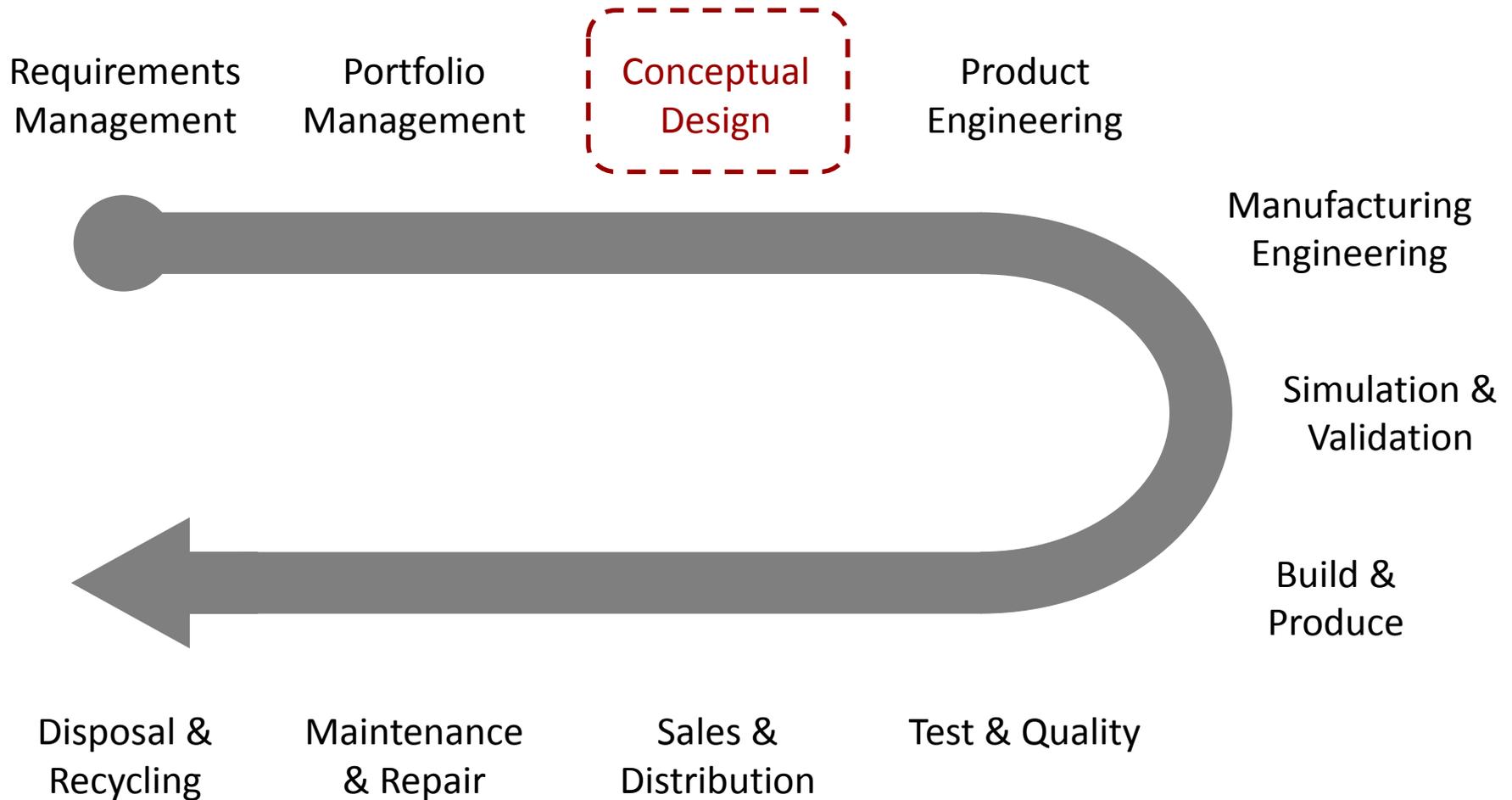
# Portfolio Management

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Product portfolio management is the planning of product lines and relationships of current and future products.

- Product Configurations
- Different Market Requirements
- Hierarchies & Relationships
- Future Expansion and Enhancements

# Product Lifecycle – Week 1

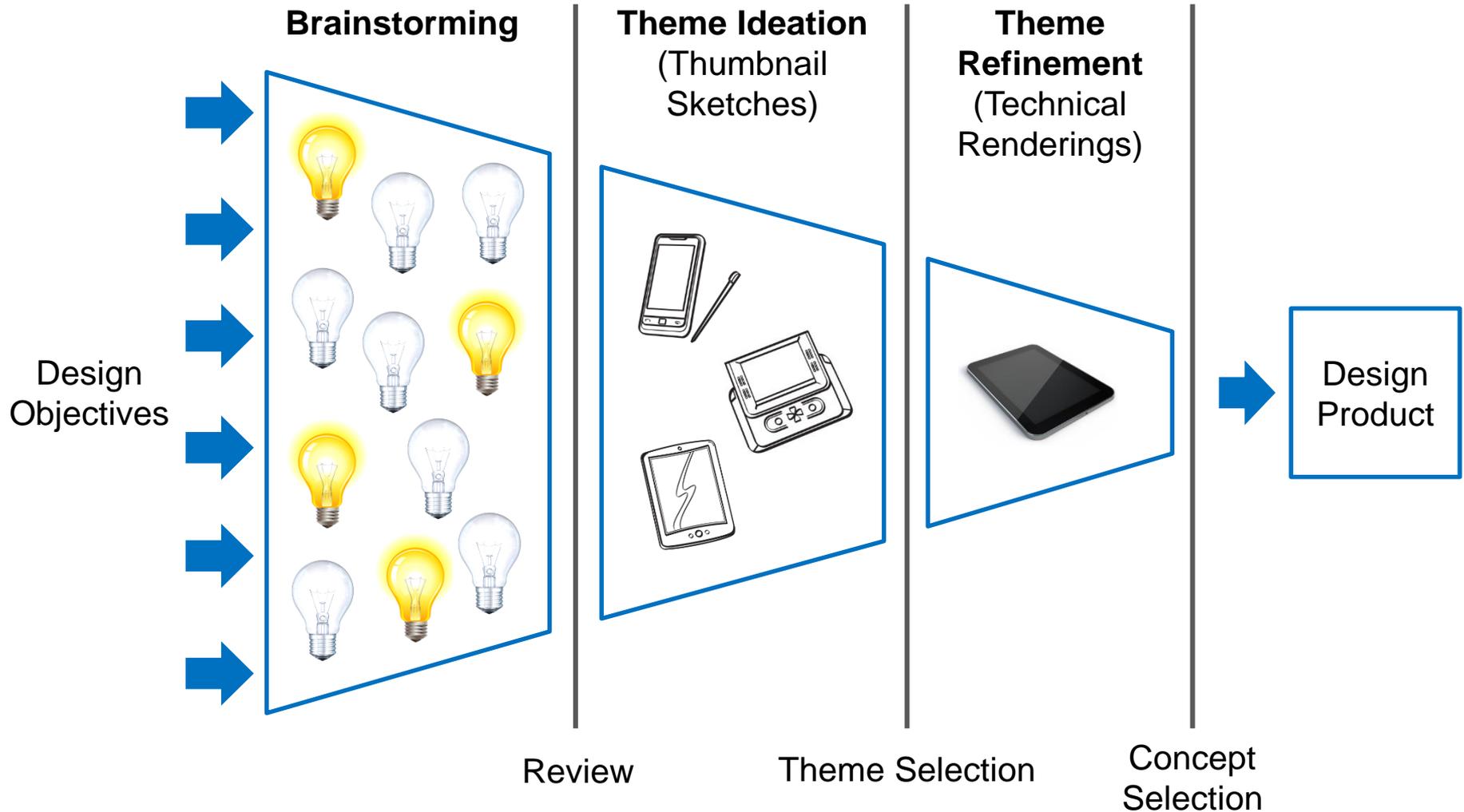


# Common Terms Used

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- **Ideation**  
The process of creating new ideas
- **Conceptual Design**  
Type of art which gives precedence to hypothetical function
- **Industrial Design**  
Improve the aesthetics, ergonomics, and usability of a product

# Conceptual Design Process



# Design Objectives

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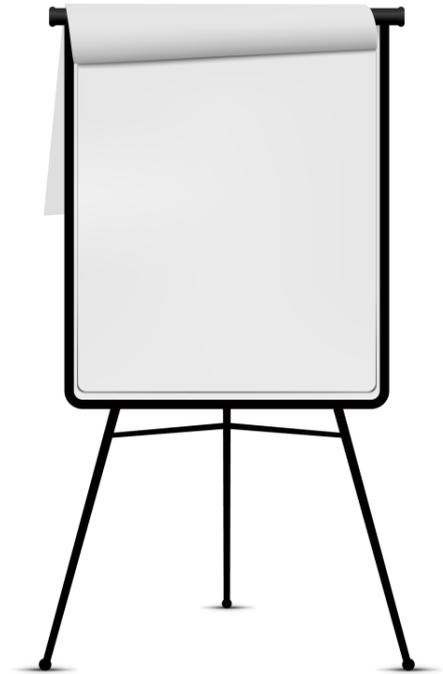
- Reference Products
- Technical Specification
- Feature Requirements
- Target Customer Profile
- Voice of Customer



# Brainstorming Phase

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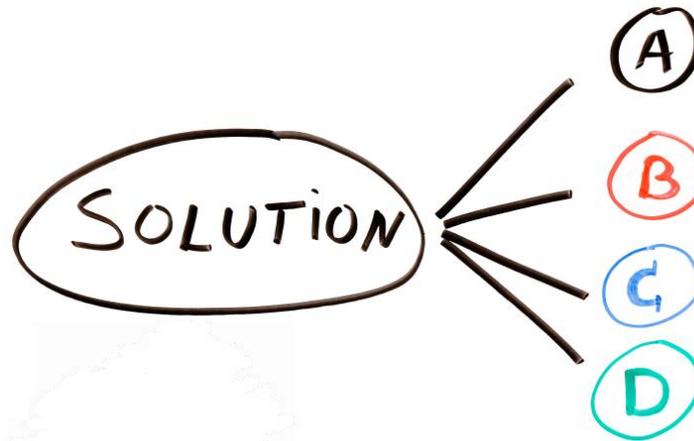
- Ensure Alignment to Design Objectives
- Combination of Individual Activity and Group Activity
- Typically Some Structured Sessions
- No Idea is a Bad Idea



# Theme Ideation Phase

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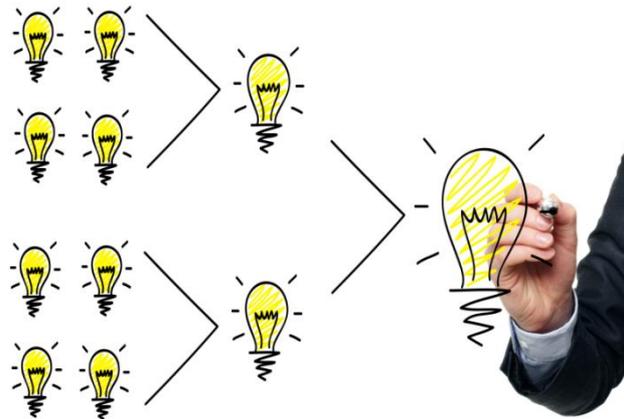
- Leverage Brainstorming Results
- Reference Back to Design Objectives
- Create Multiple Theme Thumbnail Sketches



# Theme Refinement Phase

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- Leverage Aspects of Multiple Themes
- Technical Feasibility and Manufacturability
- Quality, Cost, and Time-to-Market
- Compete Presentation of Design



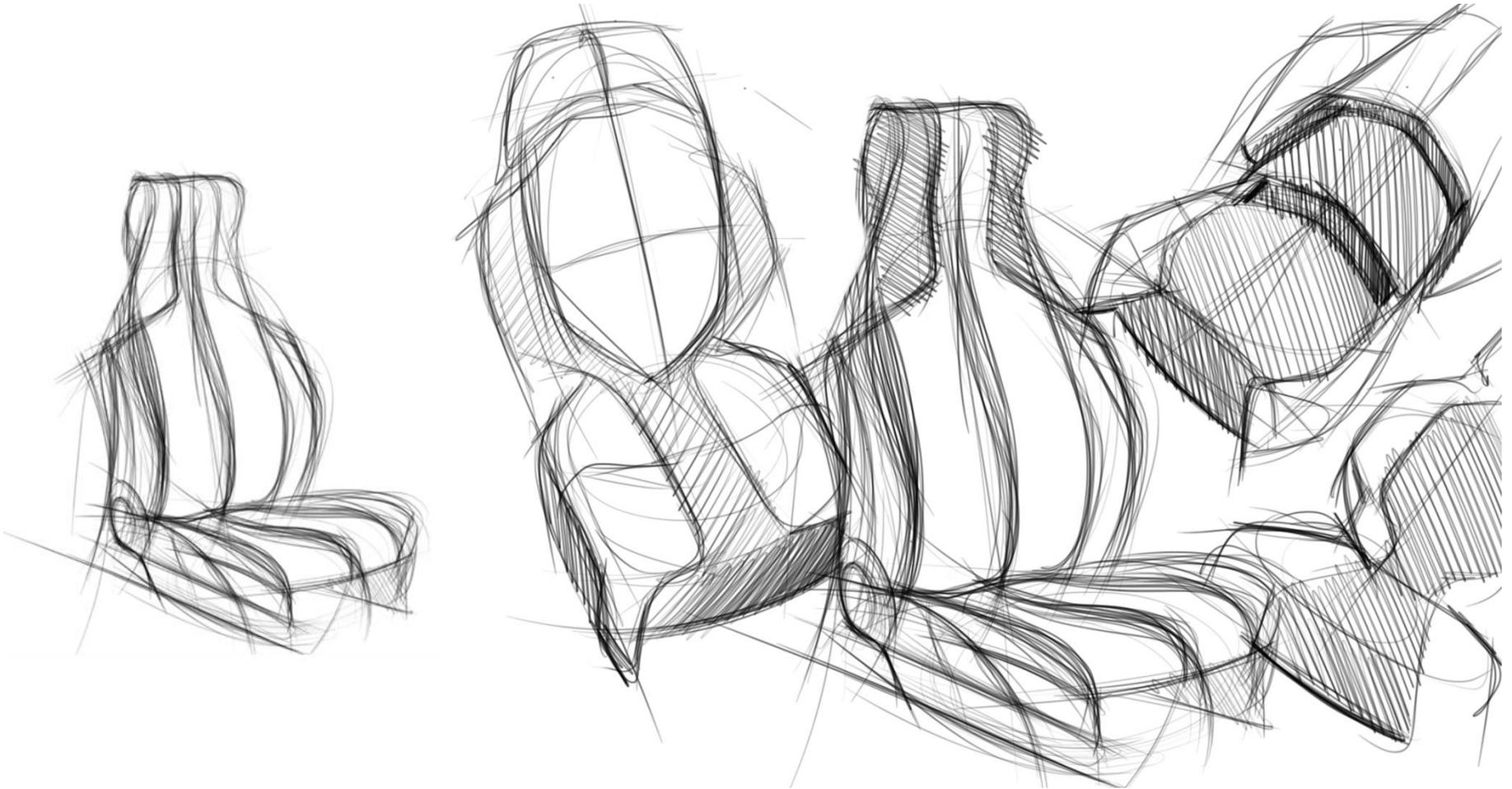
# Automotive Seat Introduction

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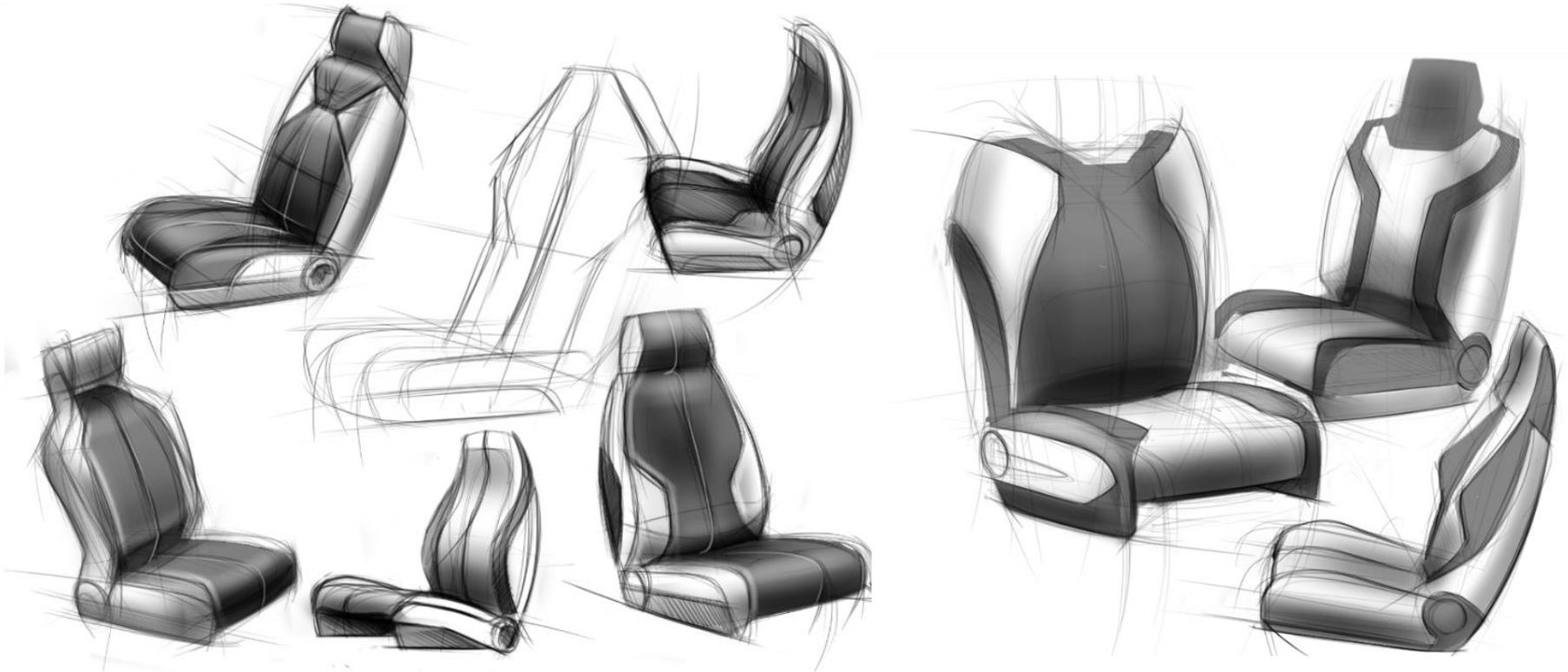
# Concept Brainstorming

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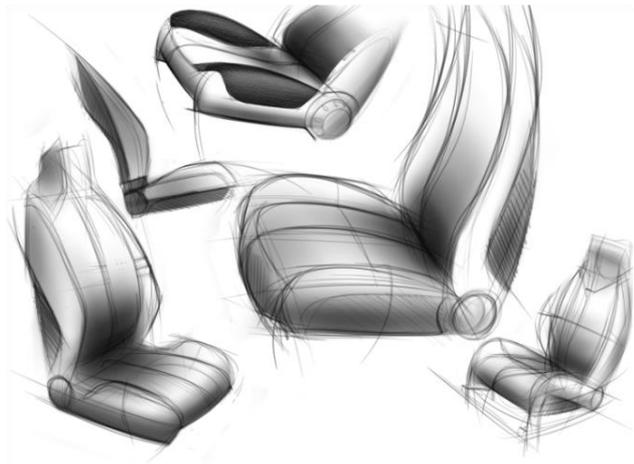
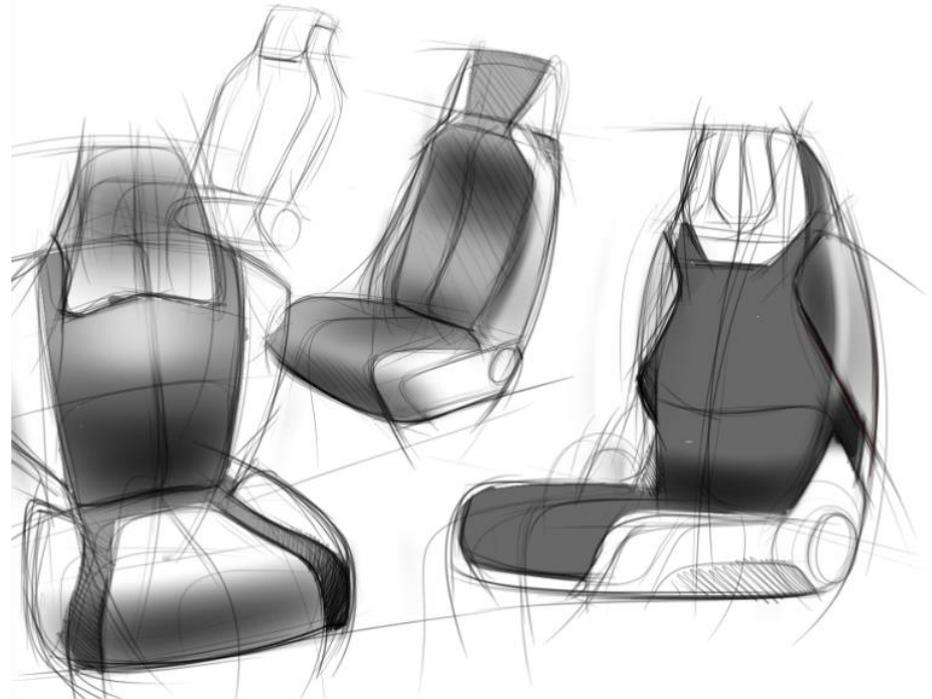
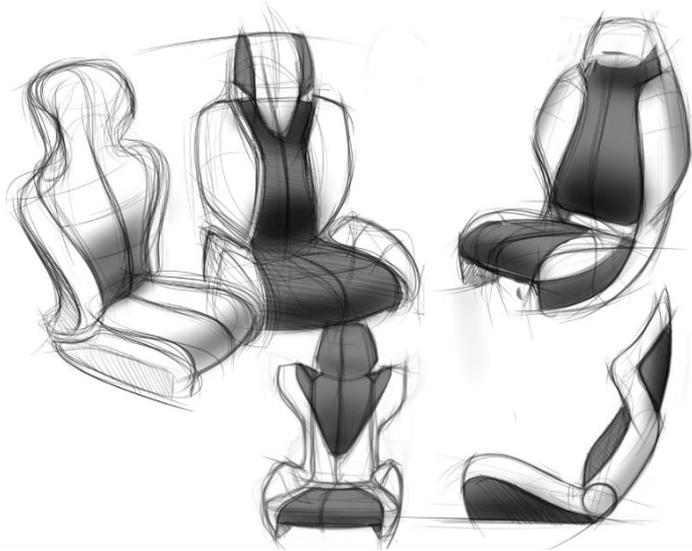


# Design Expressions (Thumbnails)

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# Design Expressions (Thumbnails)



# Theme Selection

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# Conceptual Design Surfacing / Modeling

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The conceptual design phase often includes the creation of high quality “A-Side” surfaces to define the products shape.

- Used for complex styled free formed shaded objects
- Used for high “Class-A” surfacing requirements

# Digital Sketching Benefits

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- **Sharing & Collaboration**

The digital file can easily be shared with others without scanning

- **Productivity – Faster**

Ability to sketch faster and make edits to explore more design options

- **Leverage Existing Assets**

Use existing digital files like photos and CAD files for reference

- **Downstream Use**

Reuse the digital sketch vectors and graphics for 3D model creation

# Digital Sketching Input Devices

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- **Mouse**

All general computer mouse devices

- **Touch**

Tablet based mobile or computer devices like the Apple iPad

- **Stylus / Pen**

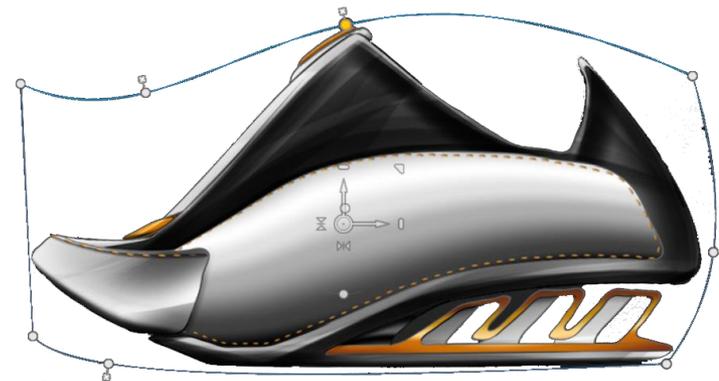
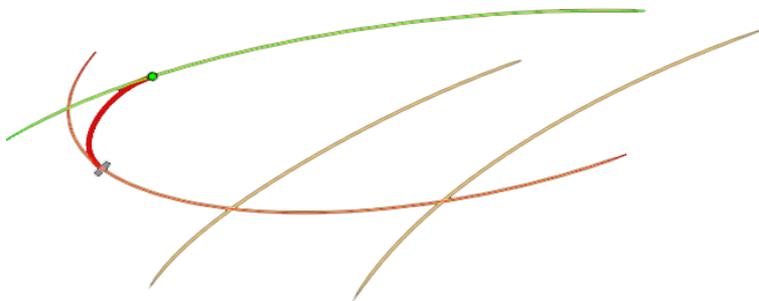
Wacom Cintiq devices are industry leading pen-and-screen devices



# Autodesk® SketchBook® Designer



- Explore concepts and product stunning artwork with a hybrid paint and vector workflow.
- SketchBook Designer provides the functionality creative professionals need to quickly transform ideas into compelling design iterations.



# Autodesk® SketchBook® Family

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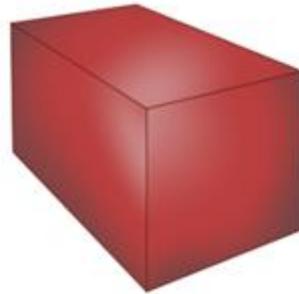
- **Autodesk® SketchBook® Mobile**  
Sketch on the go designed for mobile phone devices
- **Autodesk® SketchBook® Pro for iPad**  
Premium sketching app for the Apple iPad tablet
- **Autodesk® SketchBook® Pro**  
Robust full version for paint based digital sketching
- **Autodesk® SketchBook® Designer**  
Highest level version with all features of Pro and vector workflows  
**Note:** *You use this version in class.*

# Computer-Cluster Project (CP1)

# Cluster Project 1

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Cluster project instructions for sketching and shading basic shapes to learn Autodesk SketchBook Designer 2013.



# Cluster Project 2

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Cluster project instructions for sketching a water bottle design.



# Cluster Project 3

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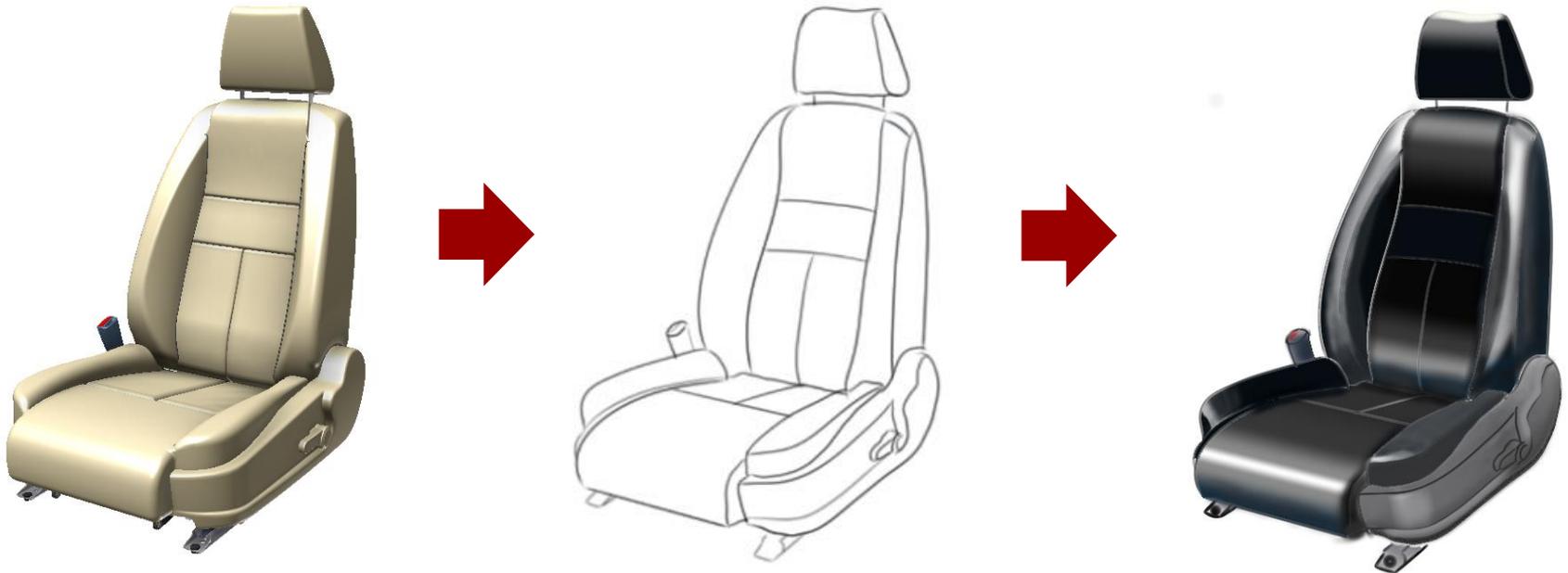
Cluster project instructions for creating an automotive wheel design.



# Problem Set Assignment

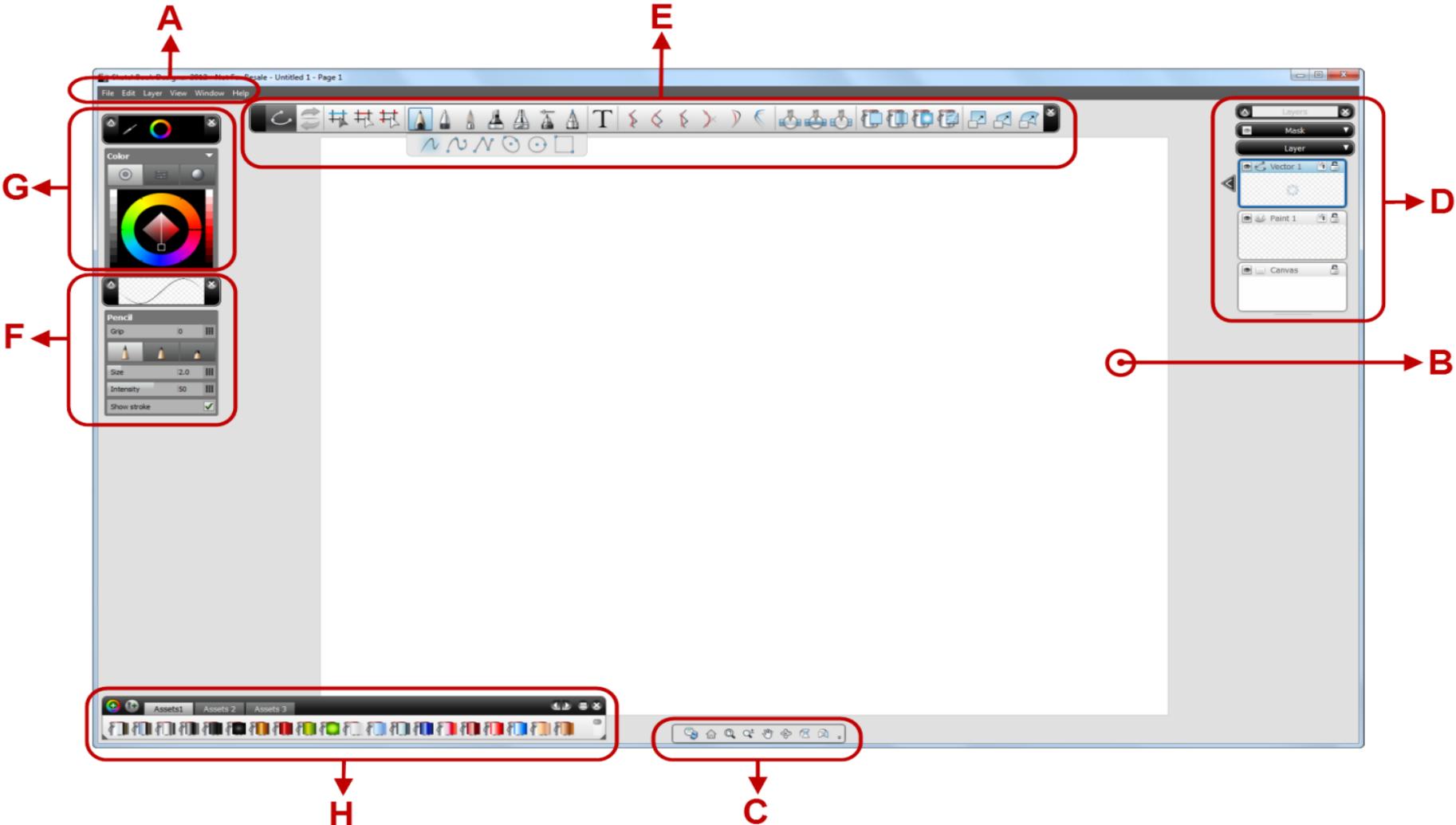
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## Problem set assignment overview

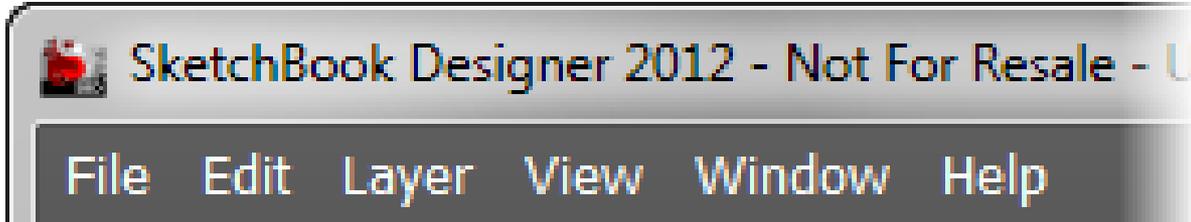


# Demo: SkechBook Designer

# User Interface



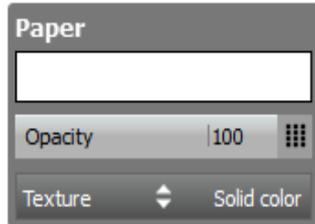
# Area A – Menu Bar



The standard general file and software commands are located here like:

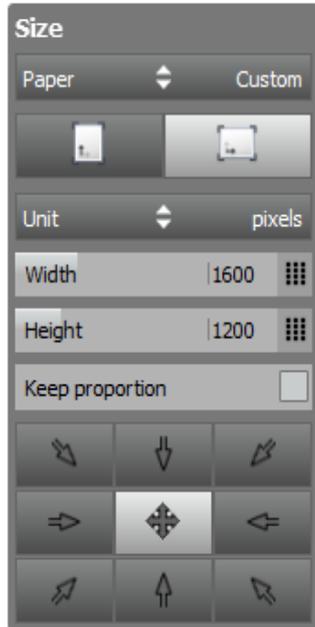
- Open
- Save
- Print
- Import and Export
- Software preference settings

# Area B – Canvas Manager



Canvas (sheet of paper).

- Sketching take place
- size
- color
- resolution
- opacity



# Area C – Navigation Bar

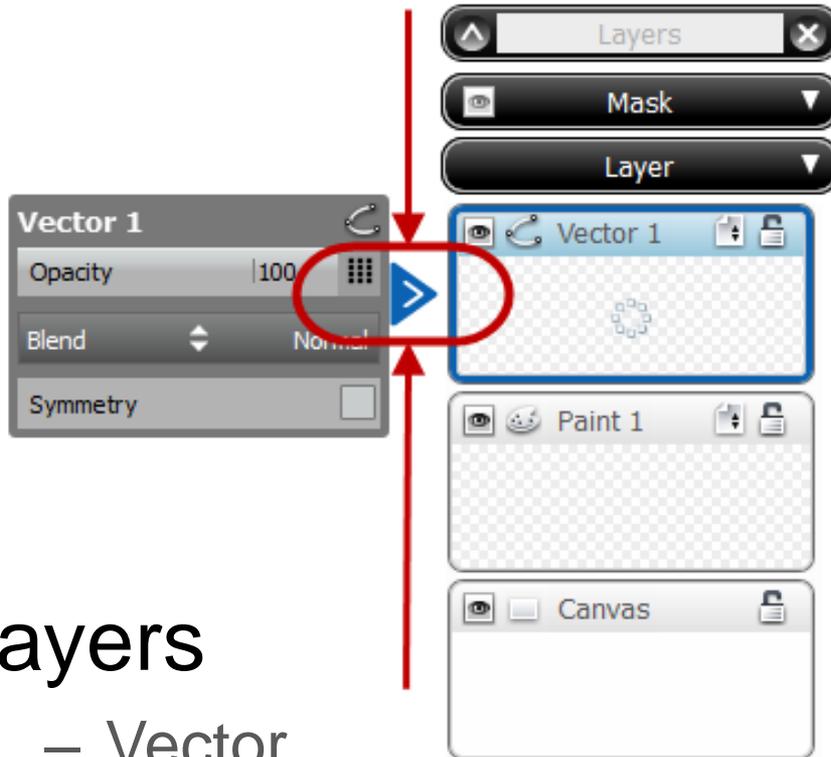


-  Zoom in and out
-  Reposition the canvas
-  Fit to view
-   Flip the canvas
-  Rotate the canvas
-  Show actual size

Hold down the **spacebar**

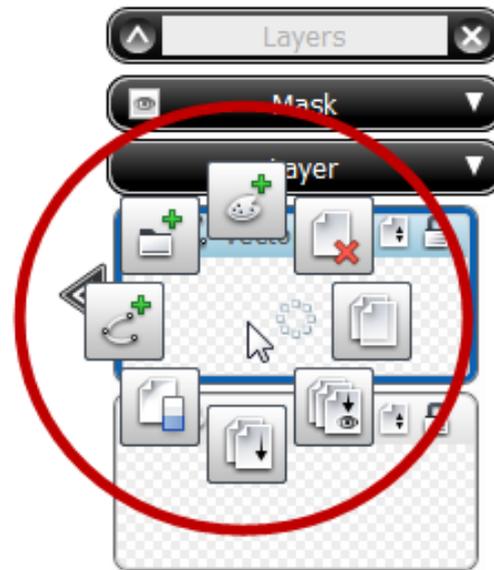


# Area D – Layer Manager



## Layers

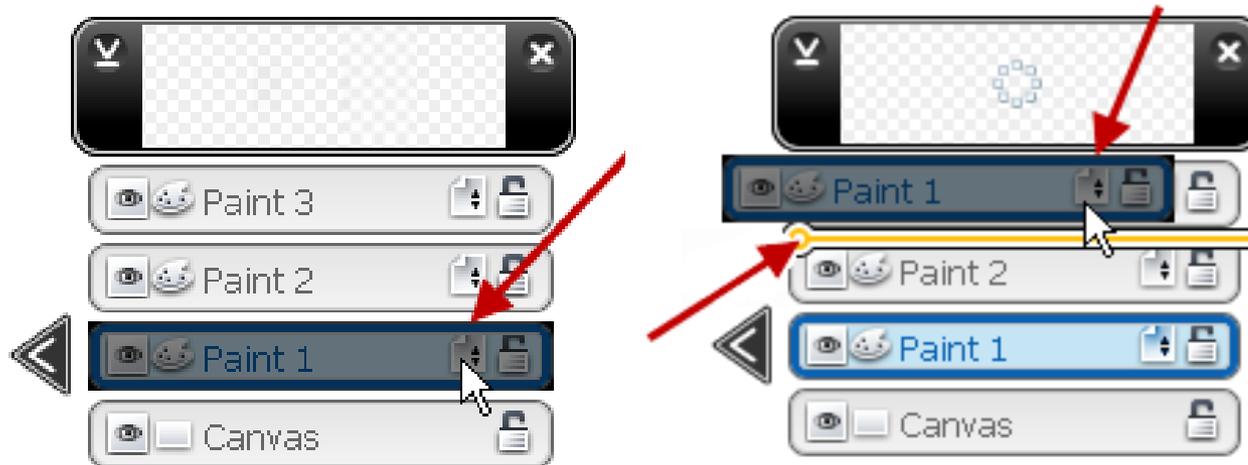
- Vector
- Paint
- Opacity
- Symmetry



## Layer Marking Menu

- Create New
- Duplicate
- Merge
- Delete
- Clear

# Area D – Layer Manager Cont'd

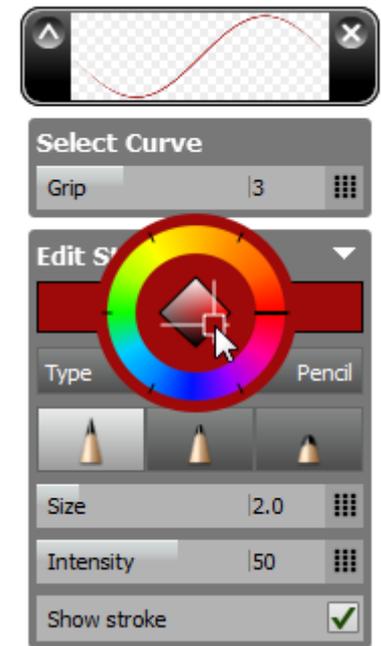
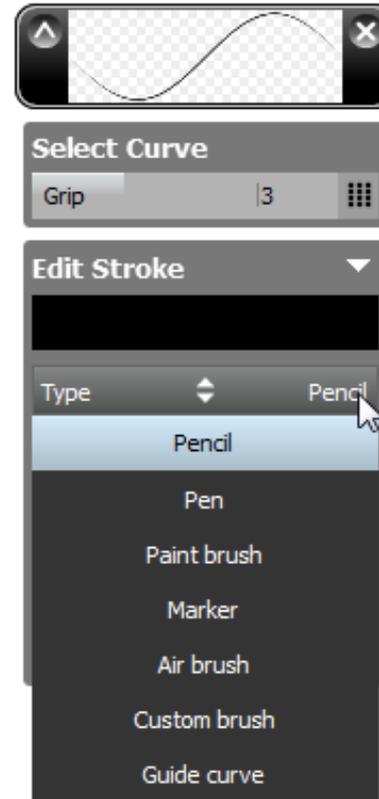
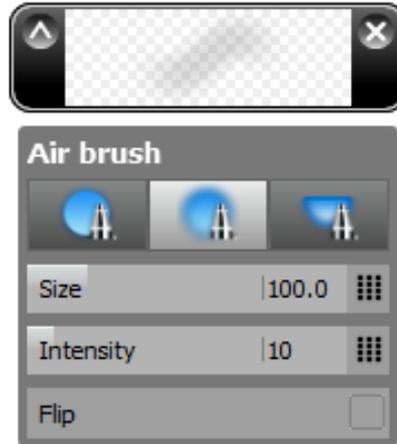
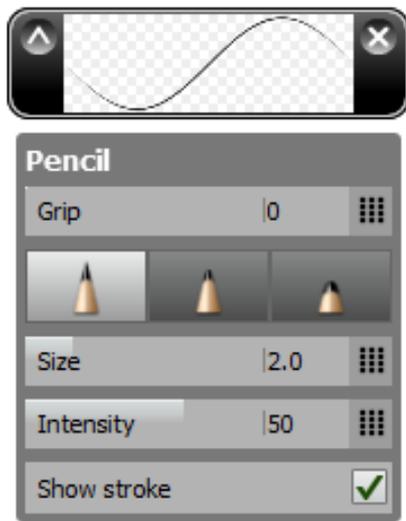


## Rearranging Layers

- Top Layer covers all the layer/sheets of paper below it
- Click the icon and drag to rearrange layers



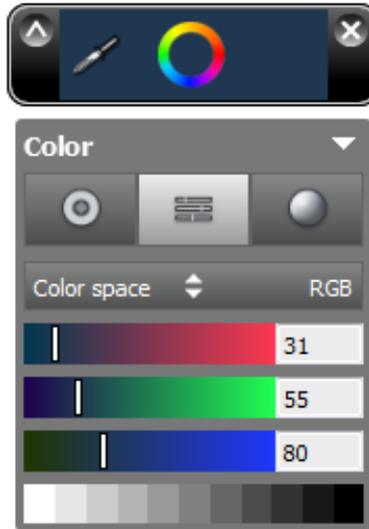
# Area F – Attribute Editor



## Editing properties

- Width
- Color
- Type

# Area G – Color Editor



## Editing Colors

- Color Picker
- Wheel
- Sliders
- Reference



# Area H – Custom Palette

- Custom Fill Palette



- Custom Color Palette



- Custom Brush Palette

