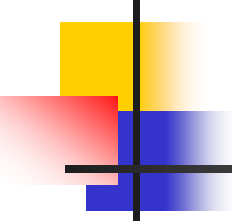


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Animation

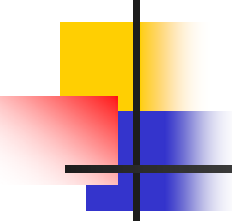
Visualization

- 👉 Visual thinking
- 👉 Hand and digital drawing
- 👉 3D spaces and transformations



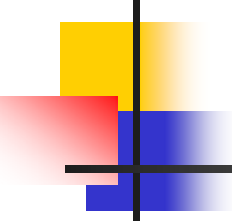
Visual Thinking

- Mental process through images not words
- Learning to look first
- Process is as important as the result
- Visualization as a means of:
 - Extending the thoughts
 - Communicating the thoughts

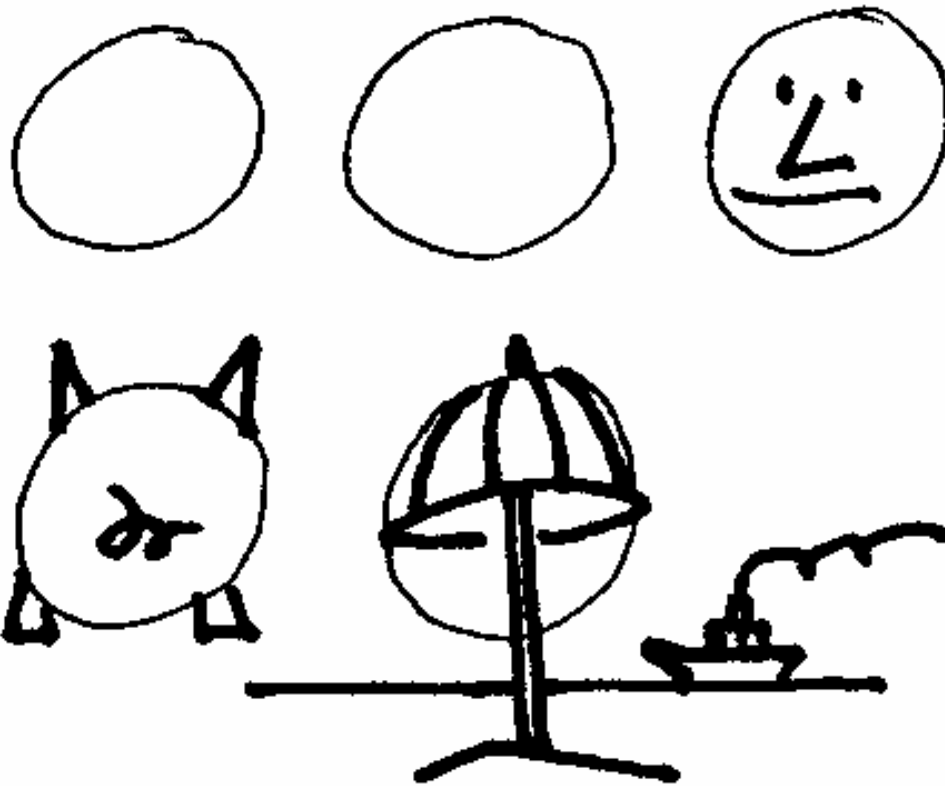


Drawing

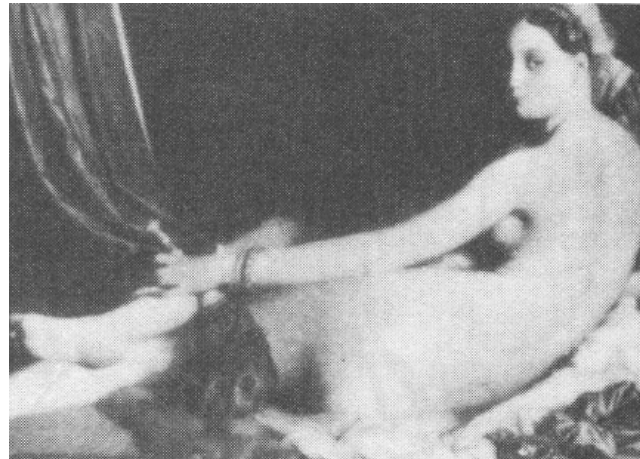
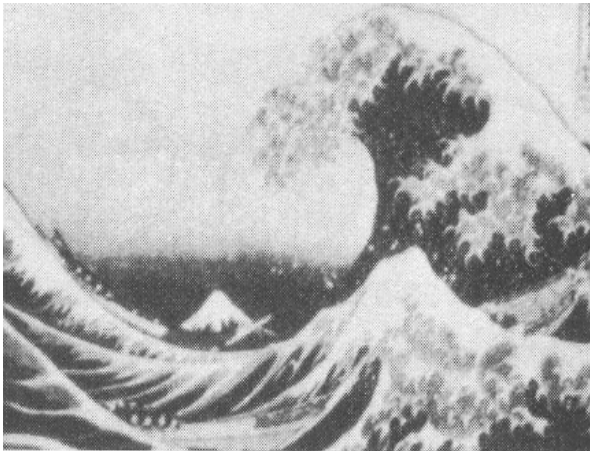
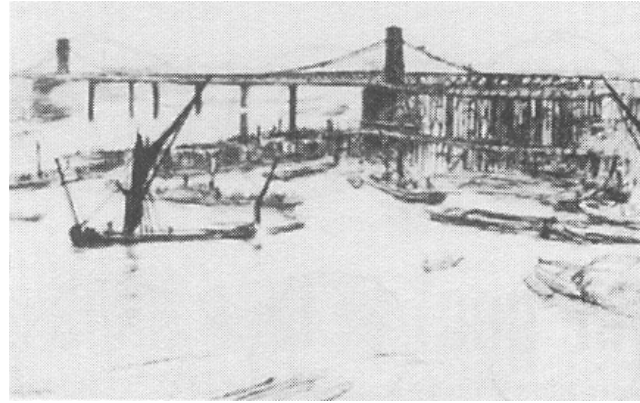
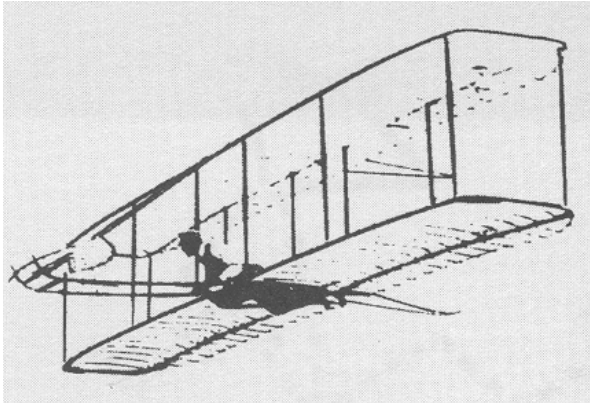
- Skills to exercise
- Improvise
 - Add details to basic shapes to create new
- Recycle
 - Copy scenes using quick strokes (basic shapes)
- Explore
 - Find objects in random lines
- Express
 - Add details to a basic head to create characters

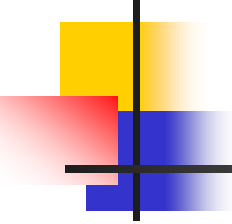


Improvise

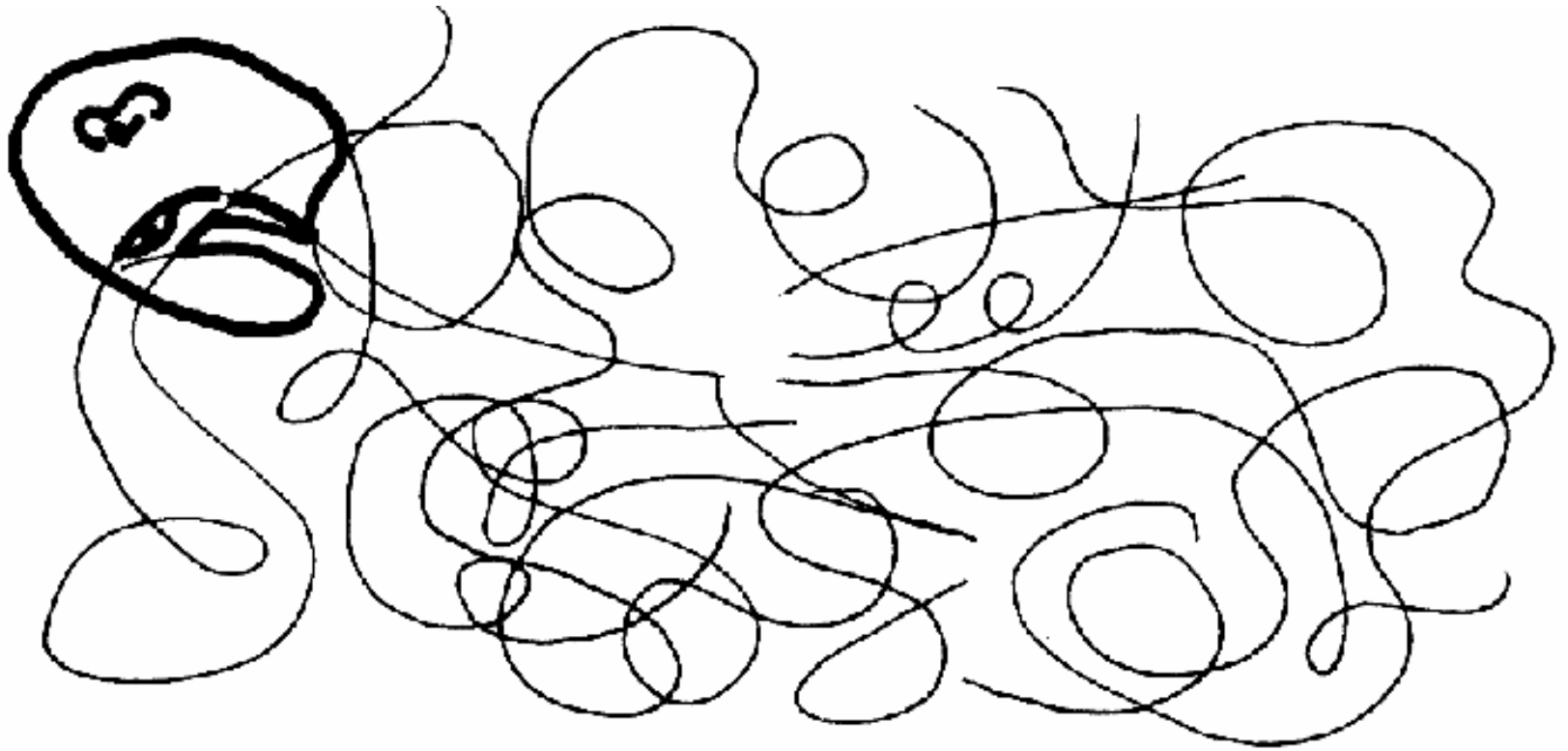


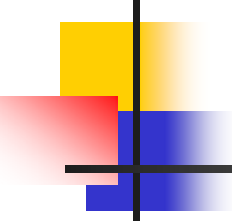
Recycle



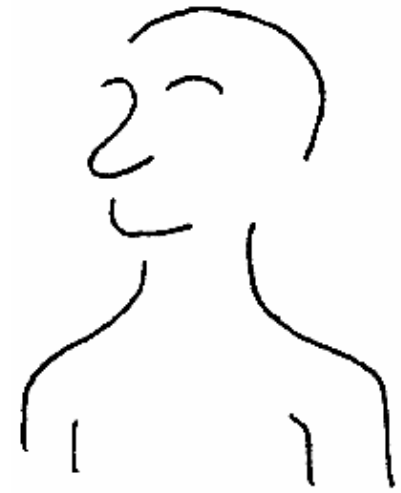
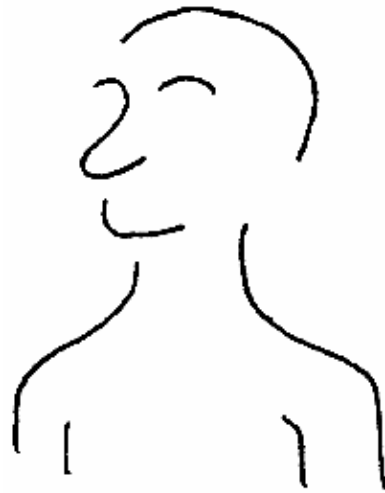
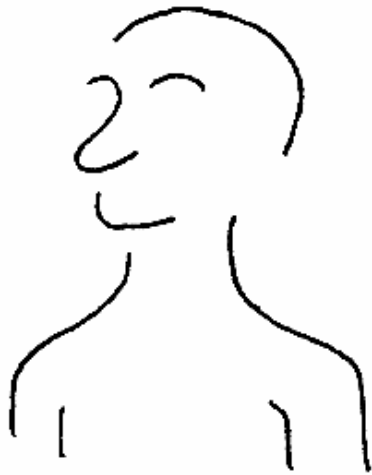


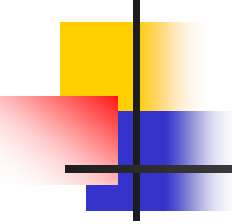
Explore





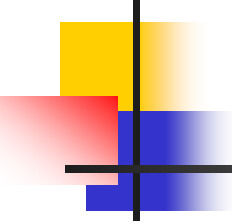
Express





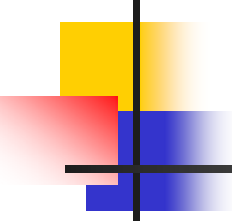
Visual Language

- Creative Clichés
- Deep Structure
- Less is more!
- Graphic Styling
- Line and body language
- Background
- Color psychology



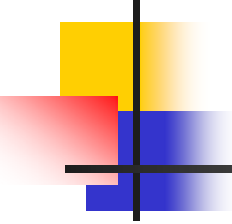
Some Visual Cues

- Heavier lines come forward
- Foot placement indicate ground
- Use more details in foreground
- Employ perspective lines
- Place shadows
- Place horizon line high in the frame



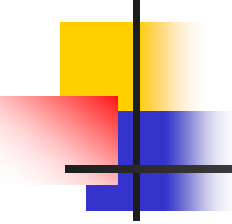
Going Digital

- Digital Images
 - Bitmap
 - Vector
 - 3D
- Paint/Draw programs
- Input devices
- Some things never change!



3D Spaces

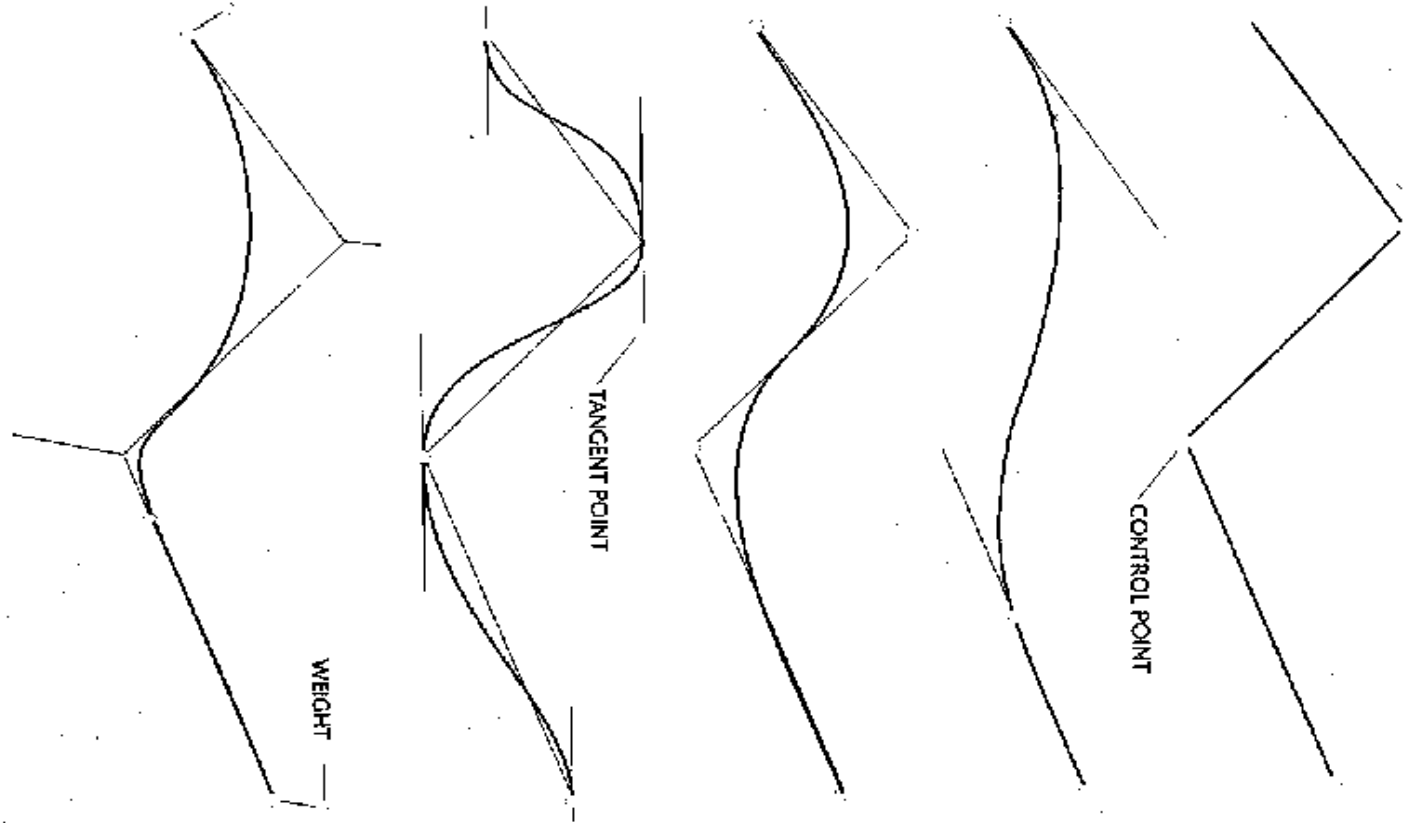
- Dimensions
- Coordinate systems
 - Cartesian
 - Spherical or azimuthal
 - World/global vs. object/local
- Numbers
 - Integer vs. floating point
 - Decimal vs. hexadecimal

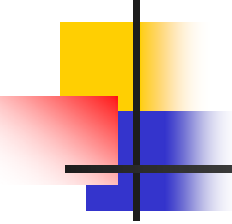


Basic Shapes

- Point
- Line (straight and curve)
 - Spline
 - Linear, cardinal, b-spline, Bezier, and NURBS (Non-Uniform Rational B-Spline)
- Surface
 - Edge and vertex
 - Orientation and surface normal
 - polygons

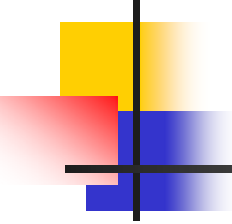
Splines





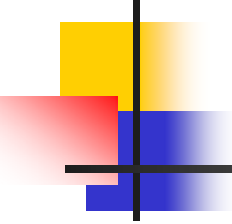
Geometric Primitives

- Cubes and Spheres
- Cylinders and Cones
- Toruses
- Polyhedra
- 2D shapes and sweeping
 - Extrusion
 - Free-form sweeping
 - Lathe



3D Transformations

- Transformation matrix
- Translation
- Rotation
- Scaling
- Perspective projection
- Camera navigation



File Formats

- Image
 - BMP, JPG, GIF, TGA, TIFF
- Structured image
 - PhotoShop, Corel, etc
- Movie
 - AVI, MPEG, Real, QuickTime
- Modeling
 - DXF, 3DS, VRML, etc