

16.810 Design and RP

Introduction to idea sketching

What is idea sketching?

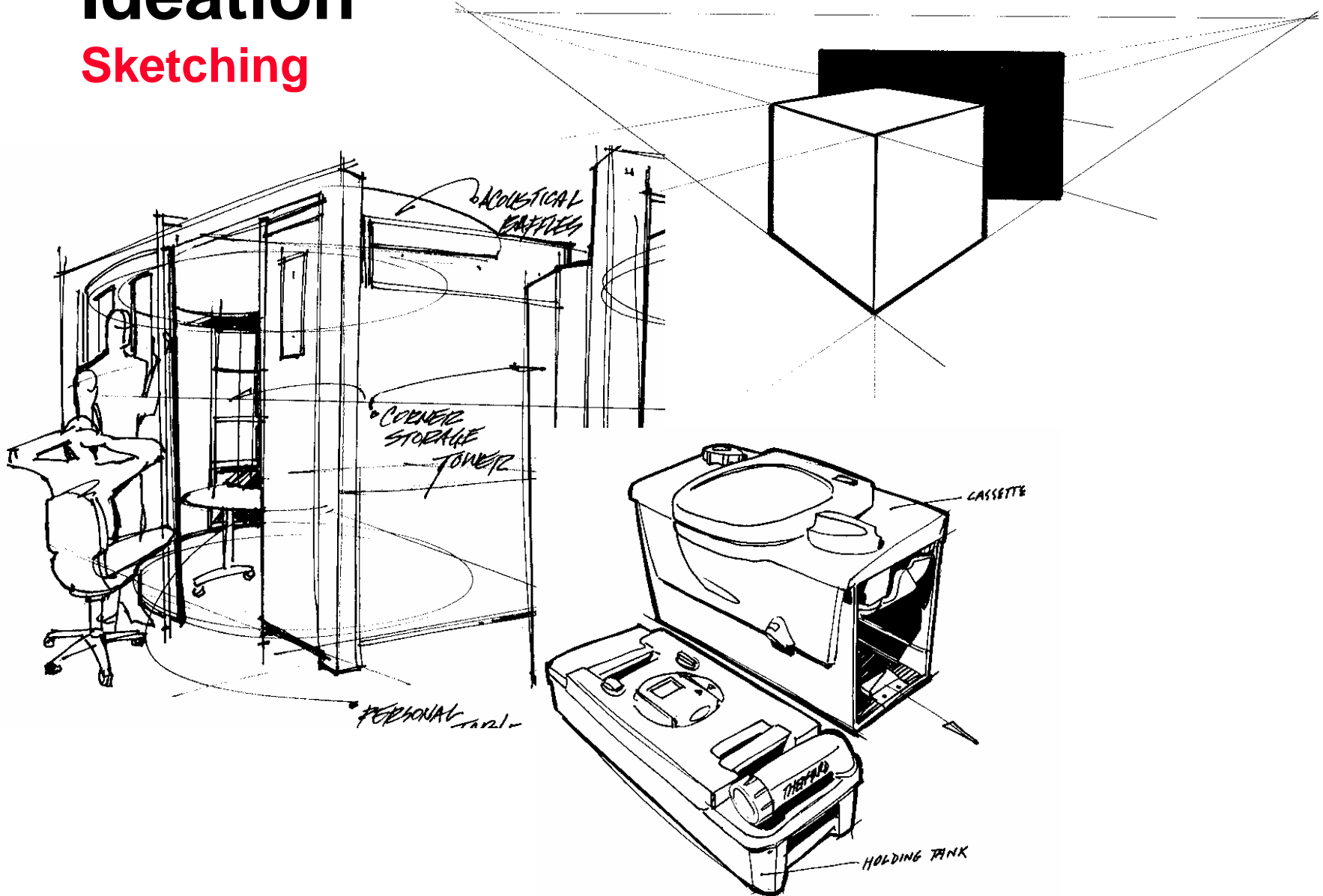
Sketching philosophy

Skills drawing basic shapes

Method to represent 3D objects in 2D

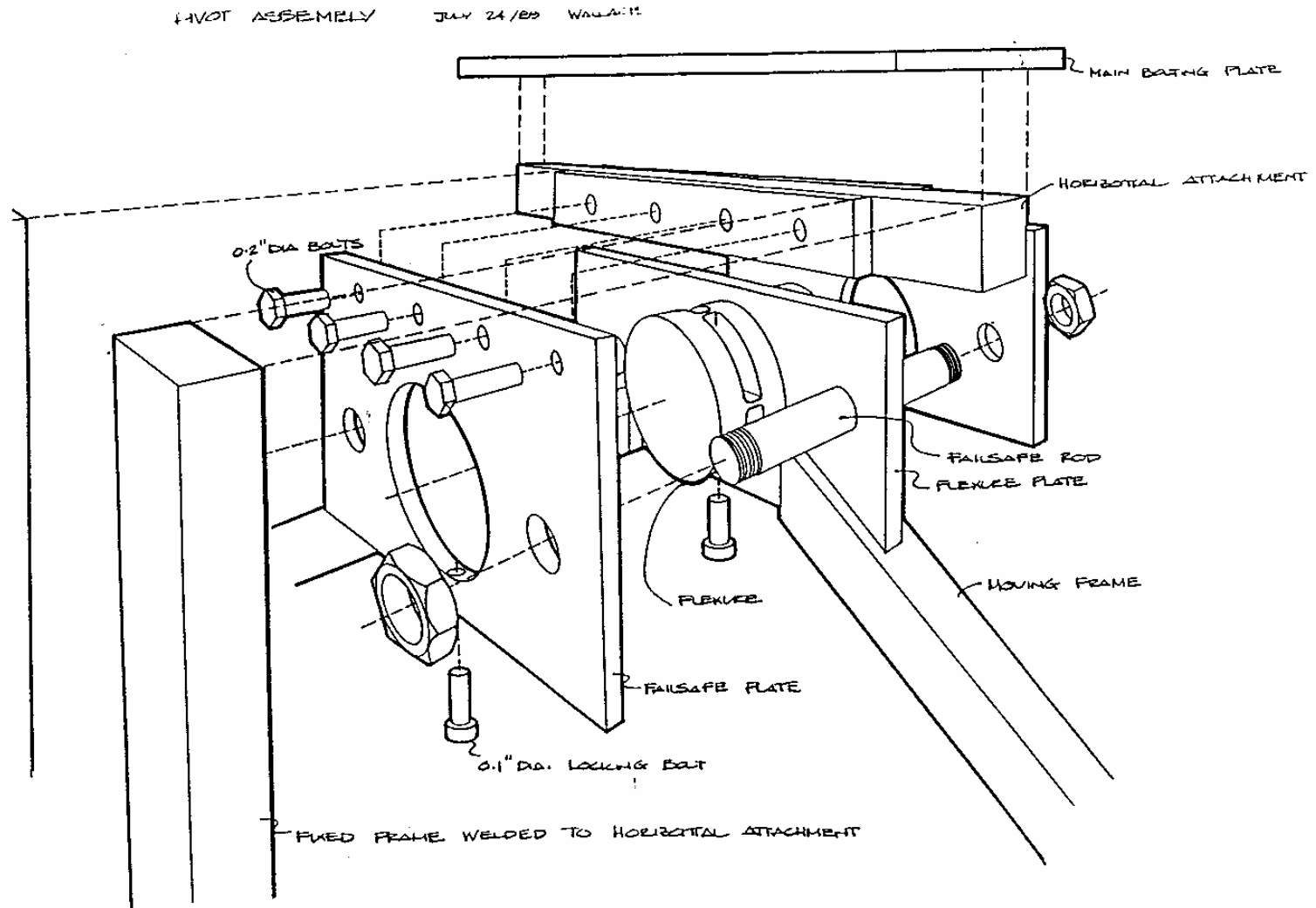
Ideation

Sketching



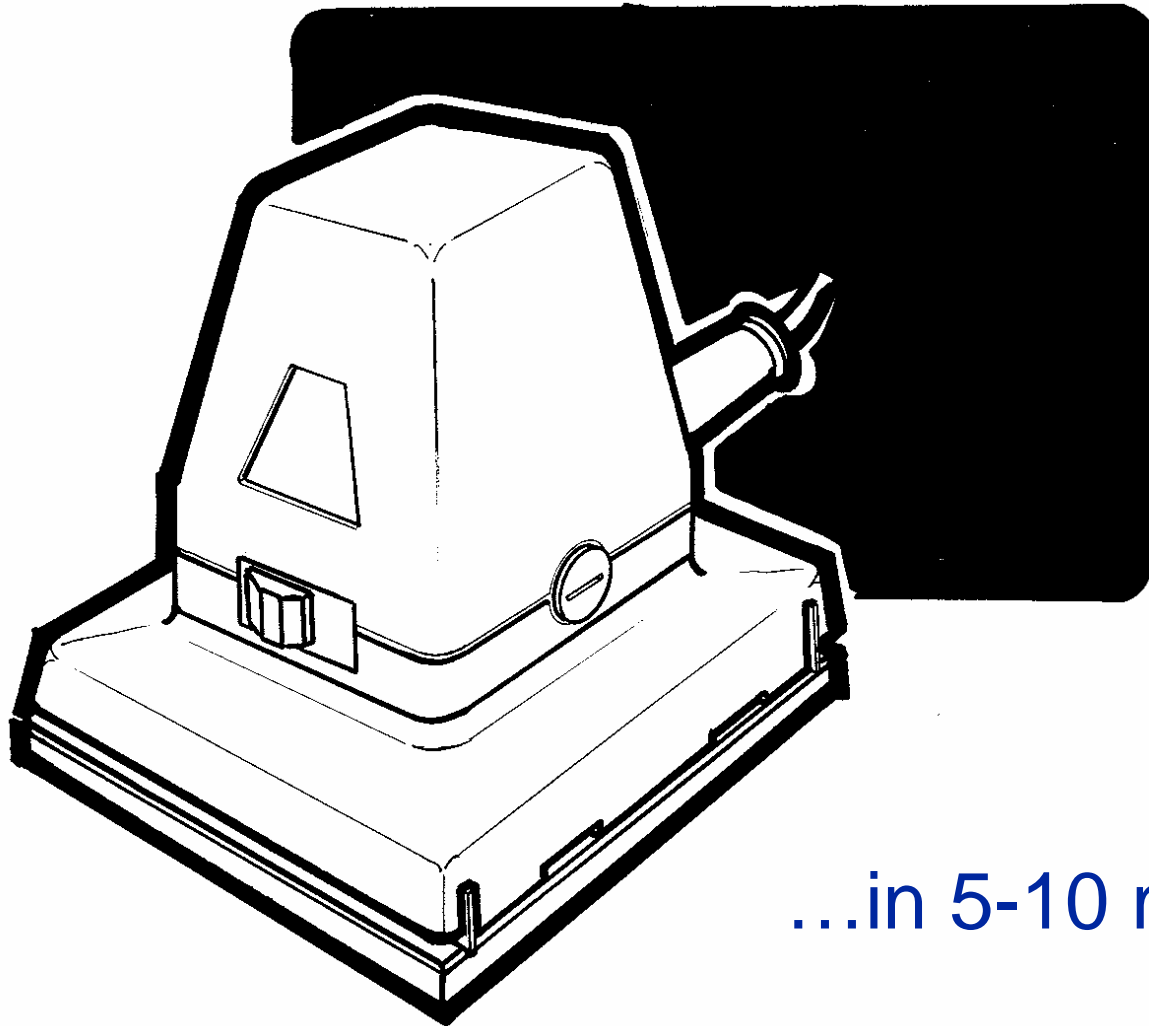
Idea Exploration

Engineering style



Goal

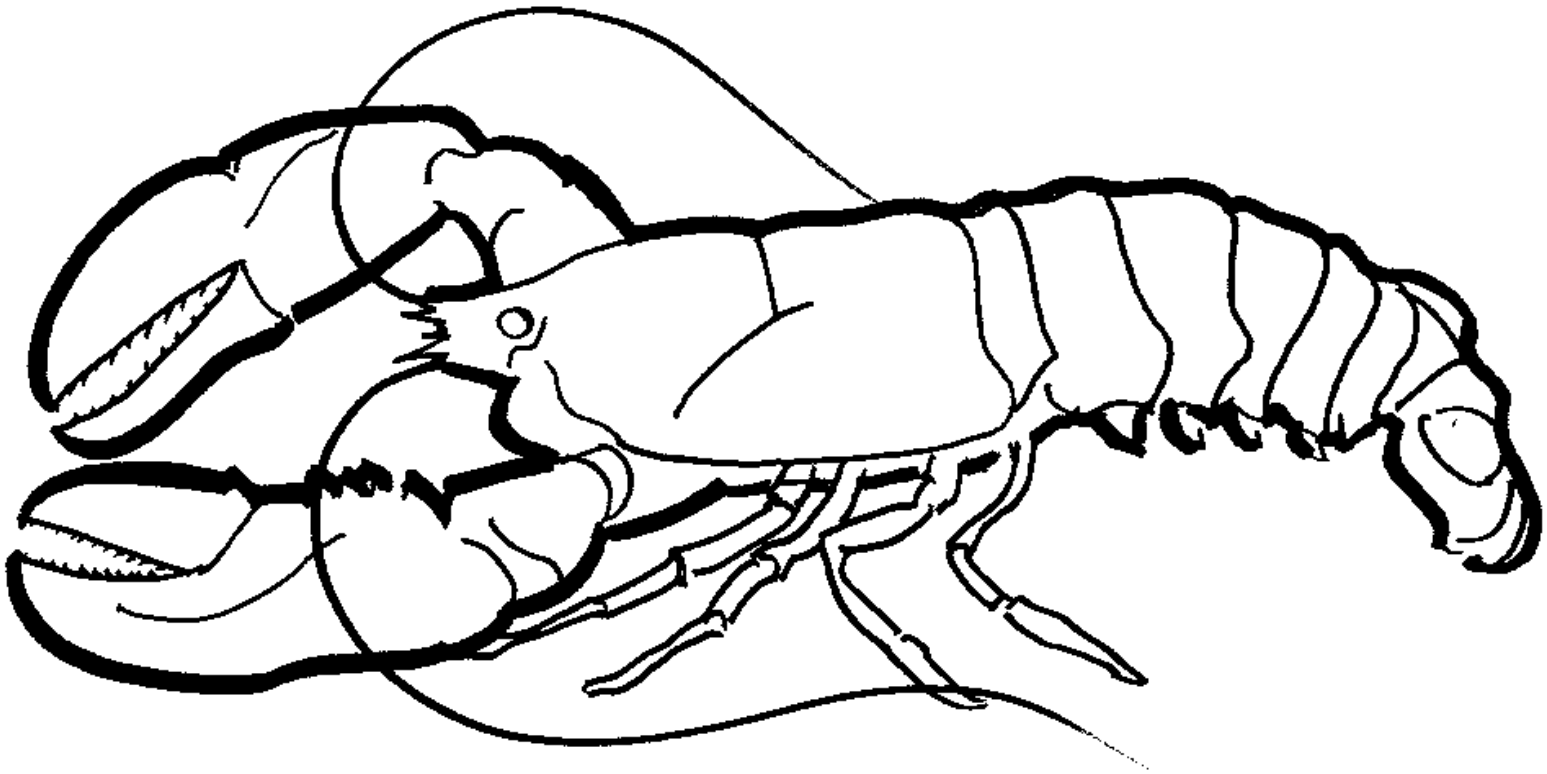
In a few weeks



...in 5-10 minutes

Sketching Philosophy

Technique and visual memory



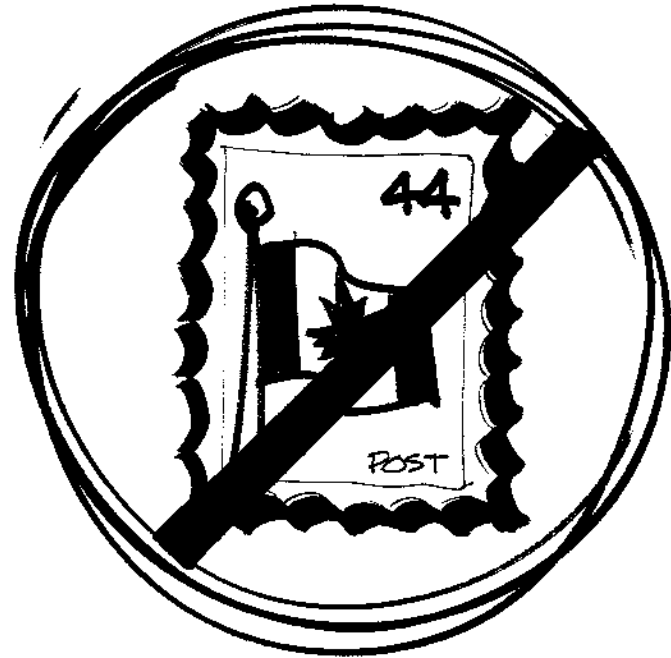
basic structure

proportion

necessary details

Technique

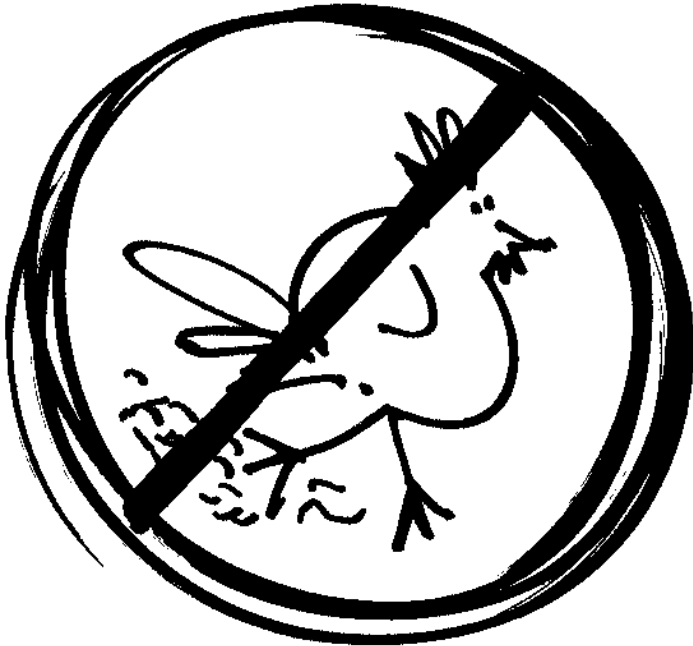
Rule number 1



no postage stamps

Technique

Rule number 2



no chicken scratches

Sketching Technique

Learning a visual language

Mental Model + Skills + Rules = Communication

cognition

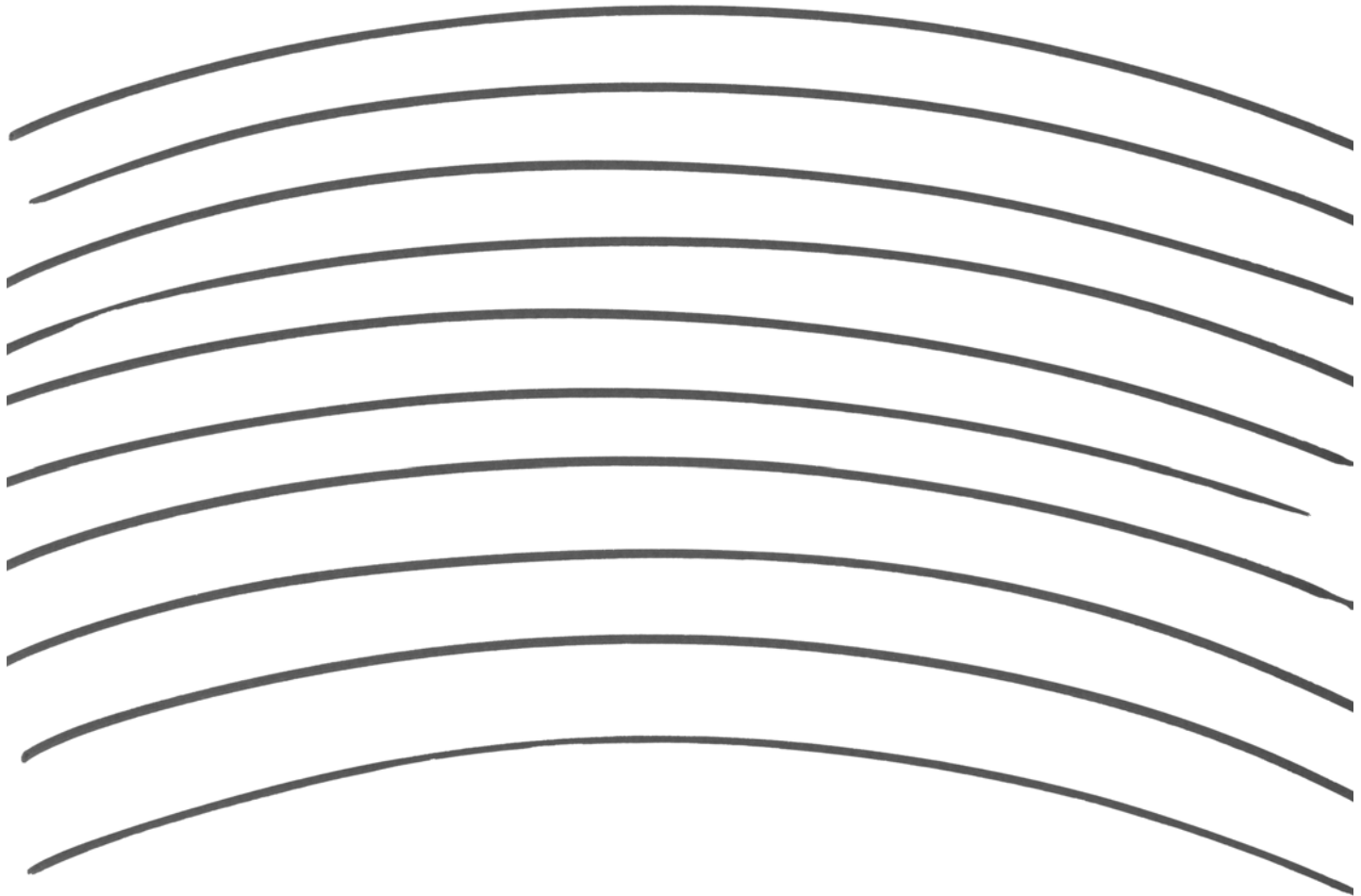
AABBCC

Spelling
Grammar

See spot run

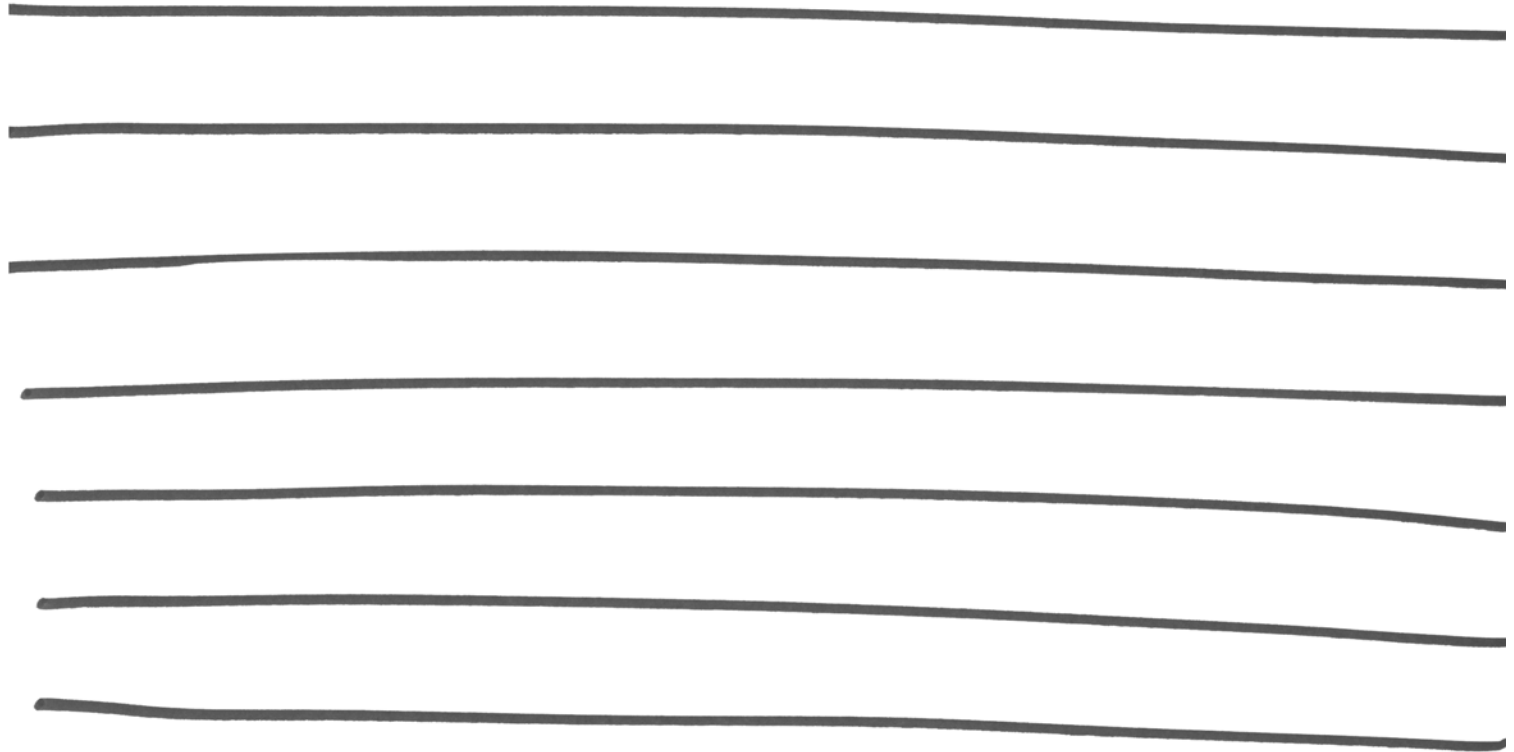
Learning Skills (abc)

Freehand arcs



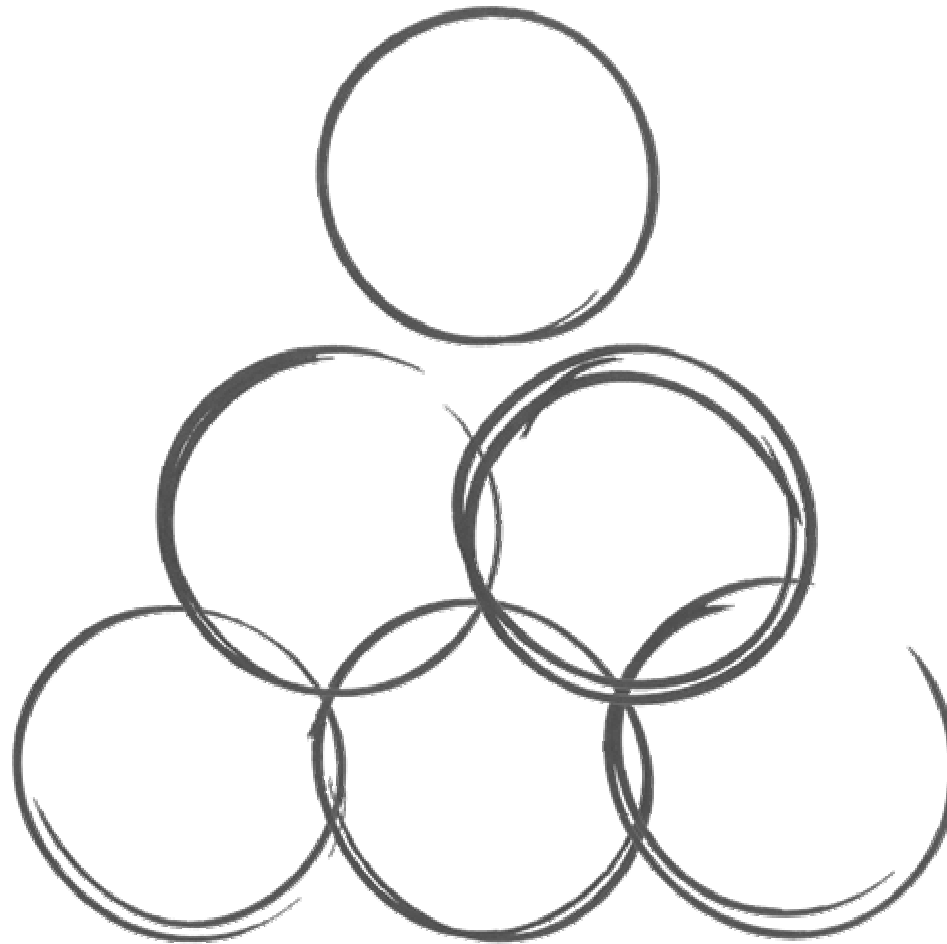
Learning Skills (abc)

Freehand lines



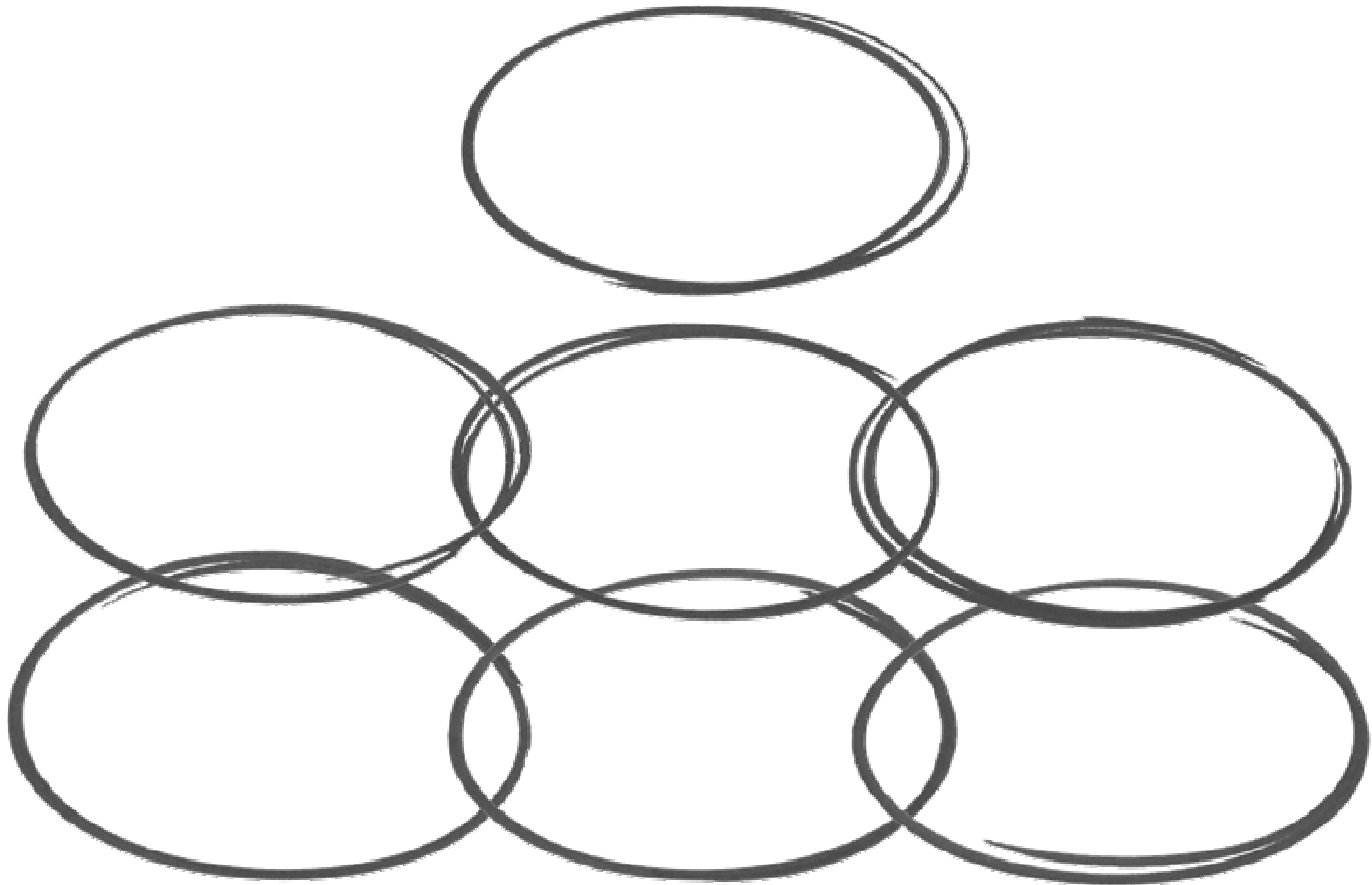
Learning Skills (abc)

Freehand circles



Learning Skills (abc)

Freehand ellipses (30 degree)



Learning The Rules (3D grammar)

Exploring space



"Excuse me for shouting—I thought you were farther away."

Perspective

Learning The Rules (3D grammar)

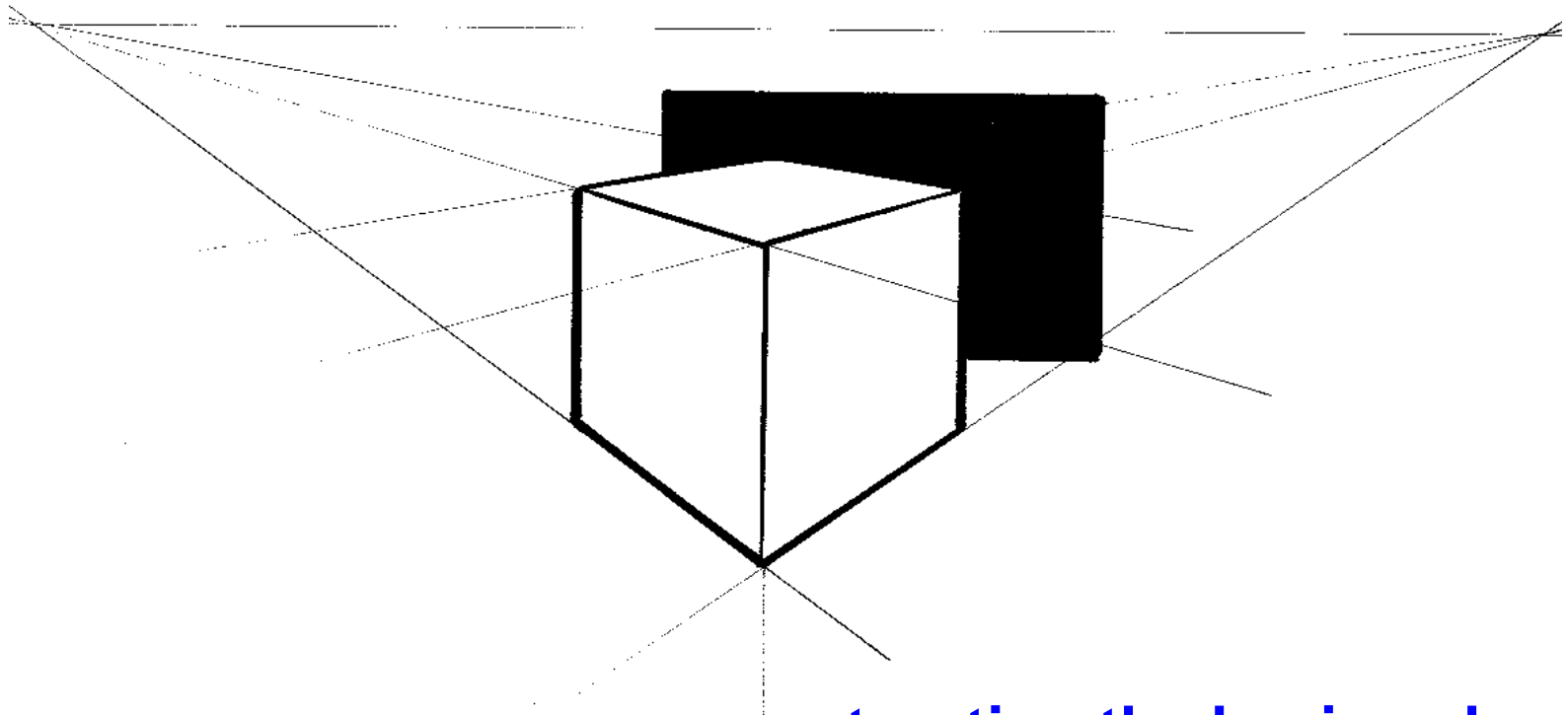
Perspective

"Perspective is nothing else than seeing a place behind a plane of glass, quite transparent, on the surface of which the object behind the glass are to be drawn".

Leonardo Davinci

Learning The Rules (3D grammar)

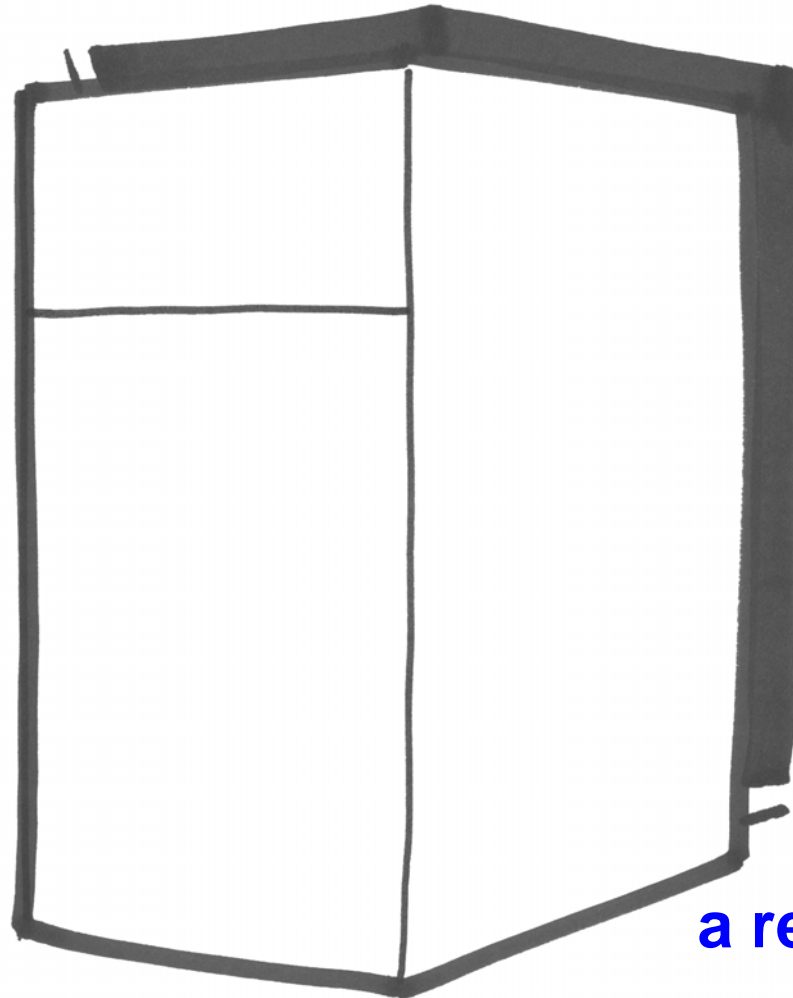
Two point perspective



constructing the basic cube

Learning The Rules (grammar)

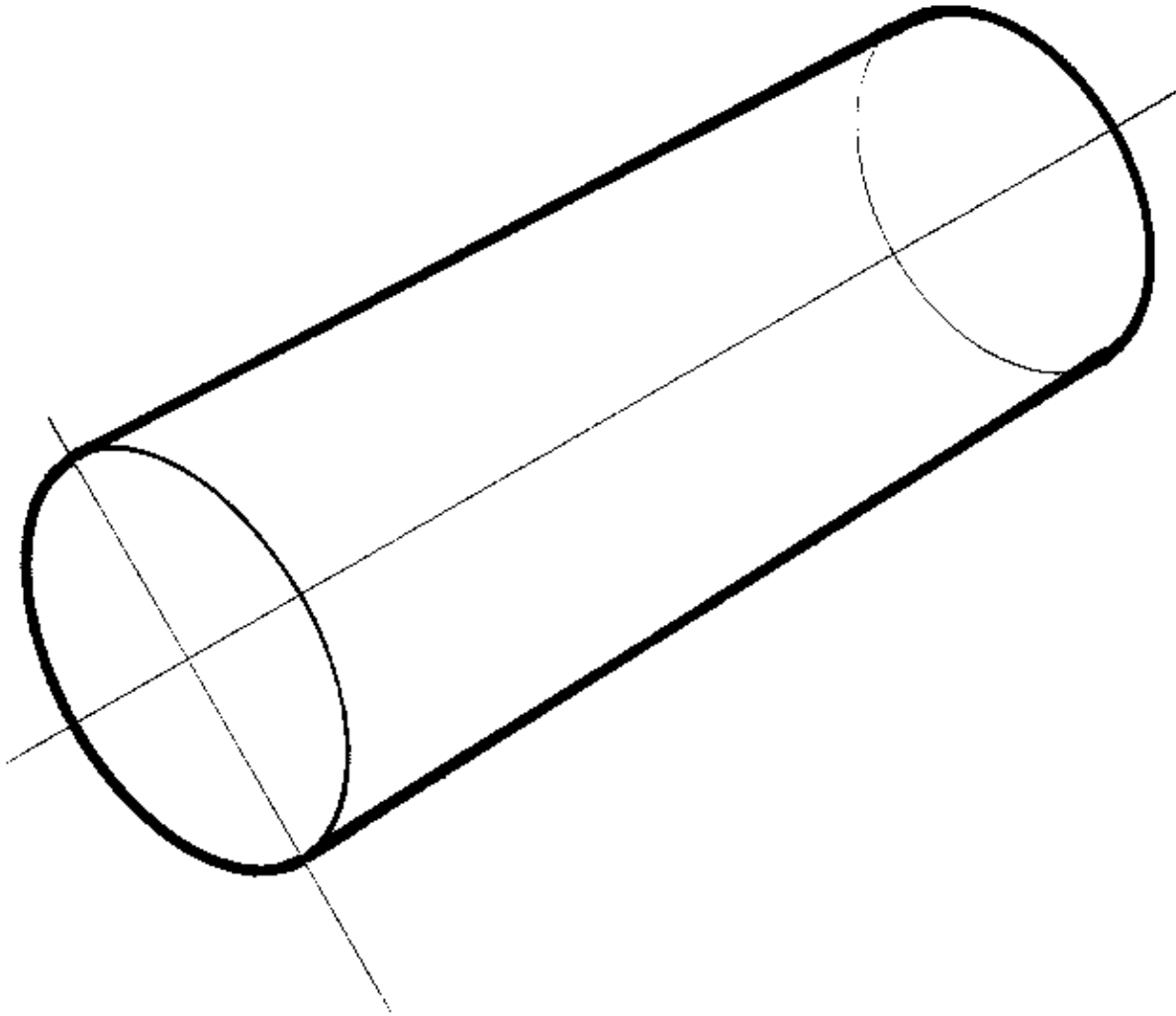
Position relative to horizon



a refrigerator?

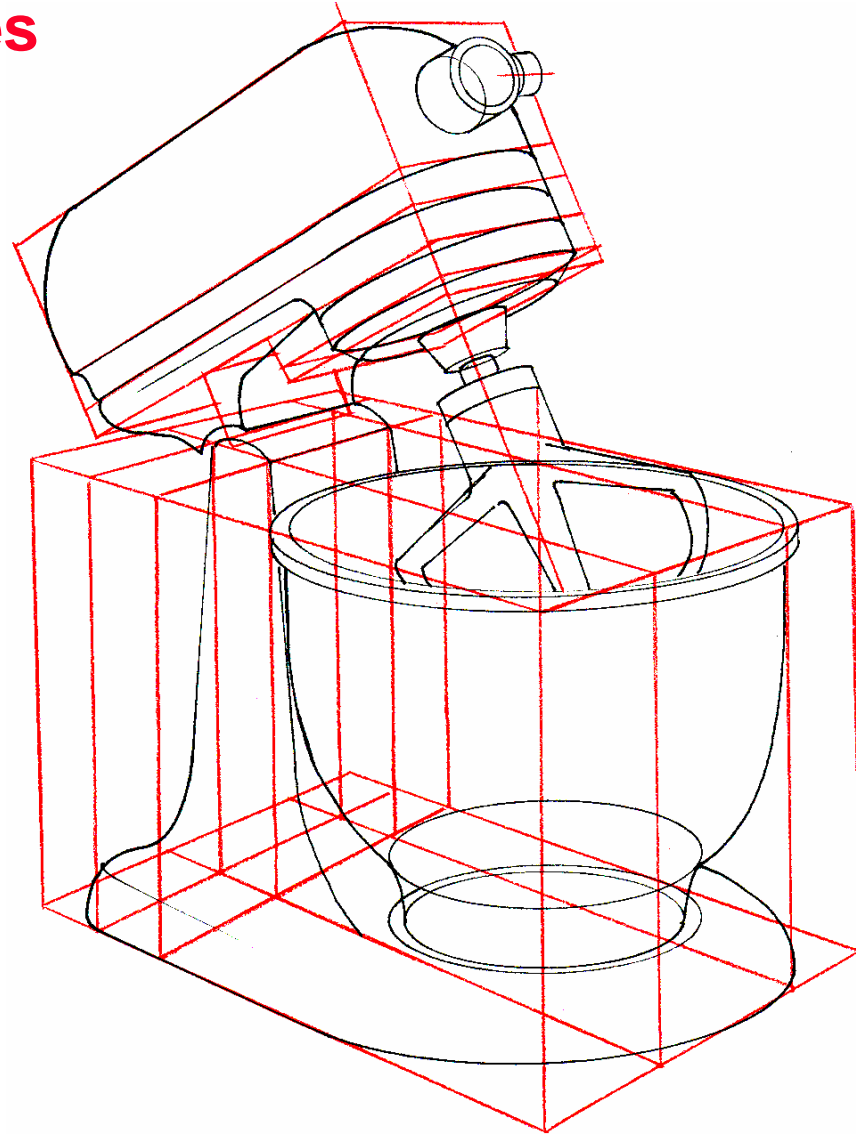
Learning The Rules (3D grammar)

Cylinders



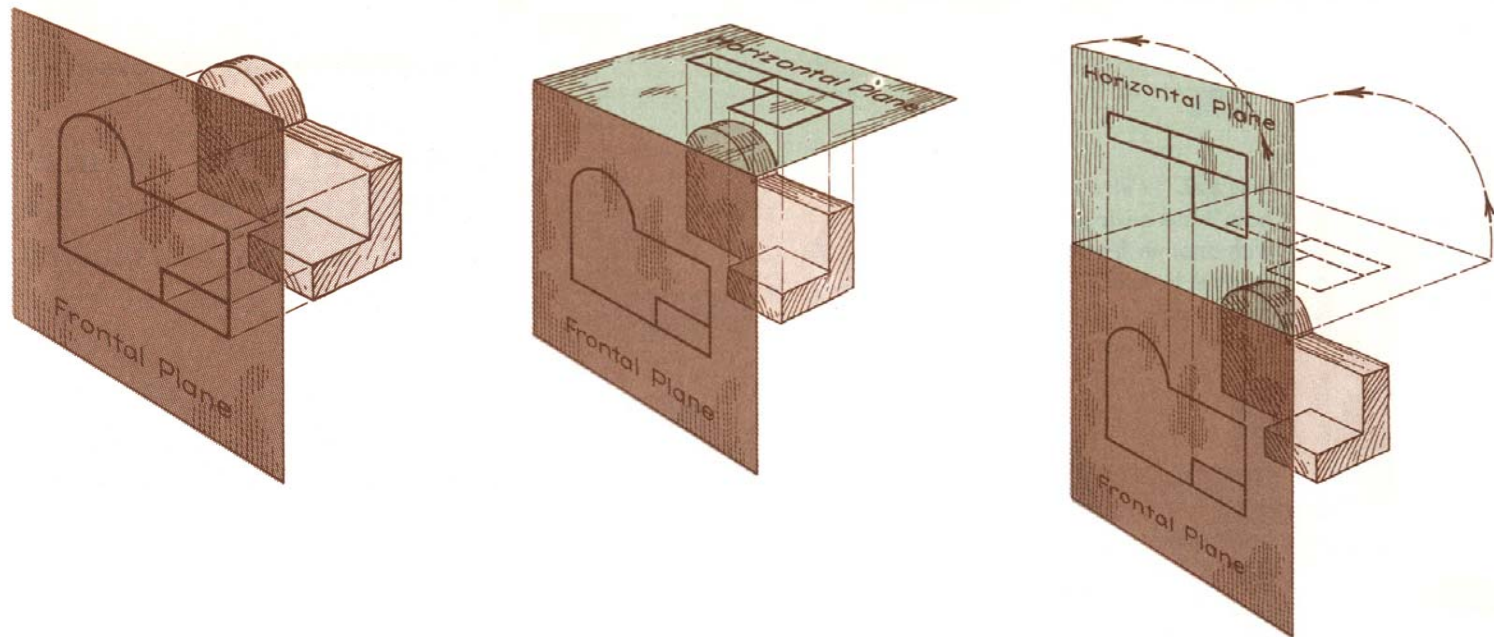
Complex Shapes

From simple shapes



Learning The Rules (2D grammar)

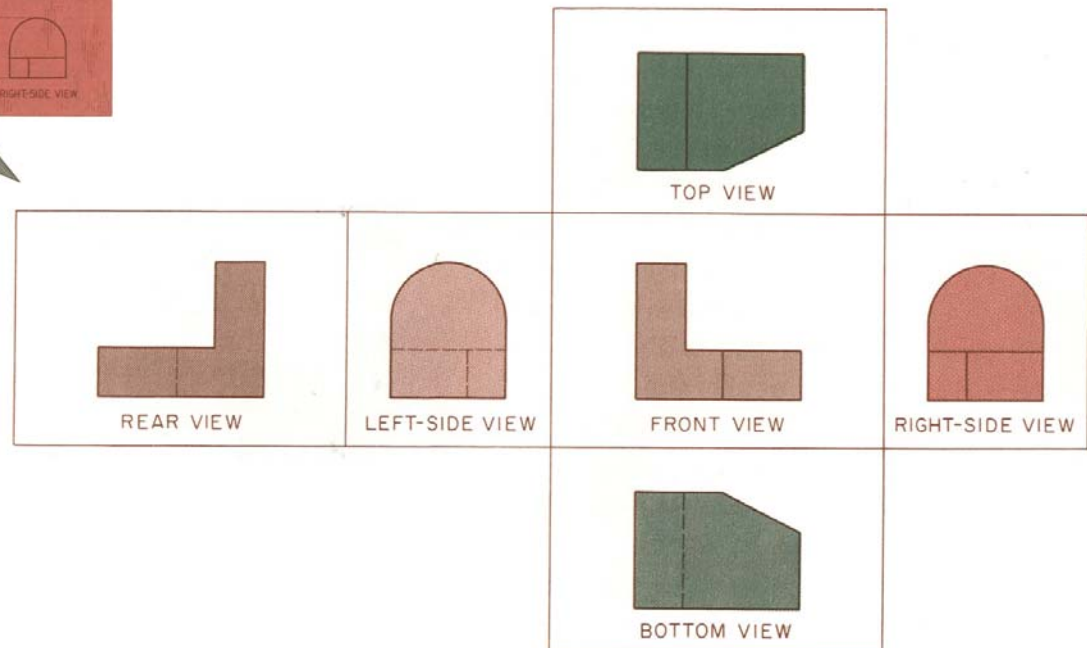
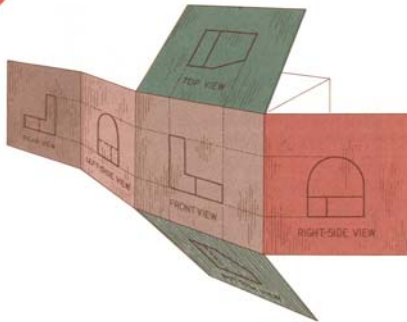
Unambiguously define shape



Orthographic projection

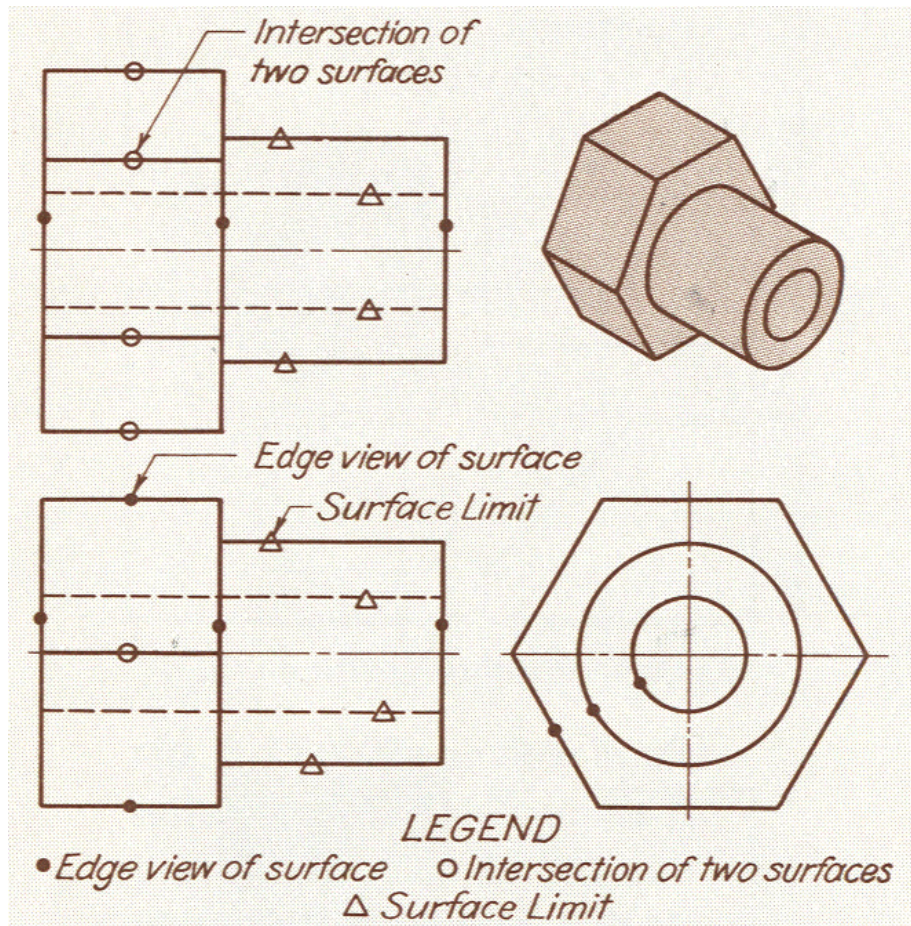
Learning The Rules (2D grammar)

Convention



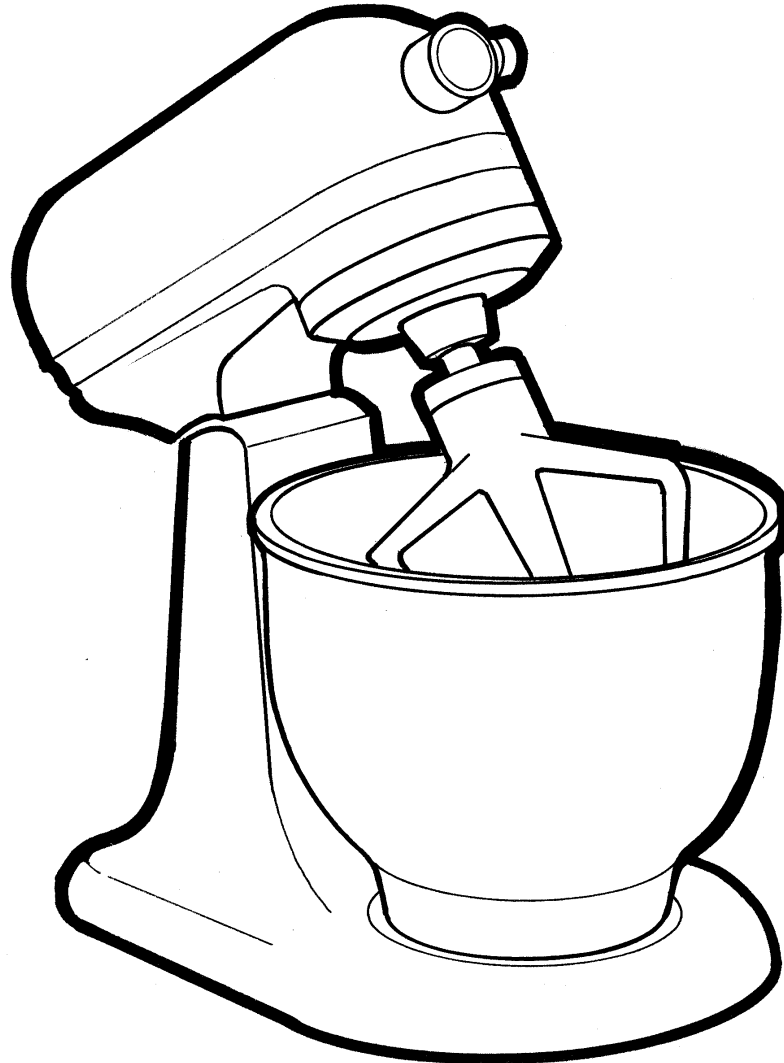
Orthographic Projection

Lines



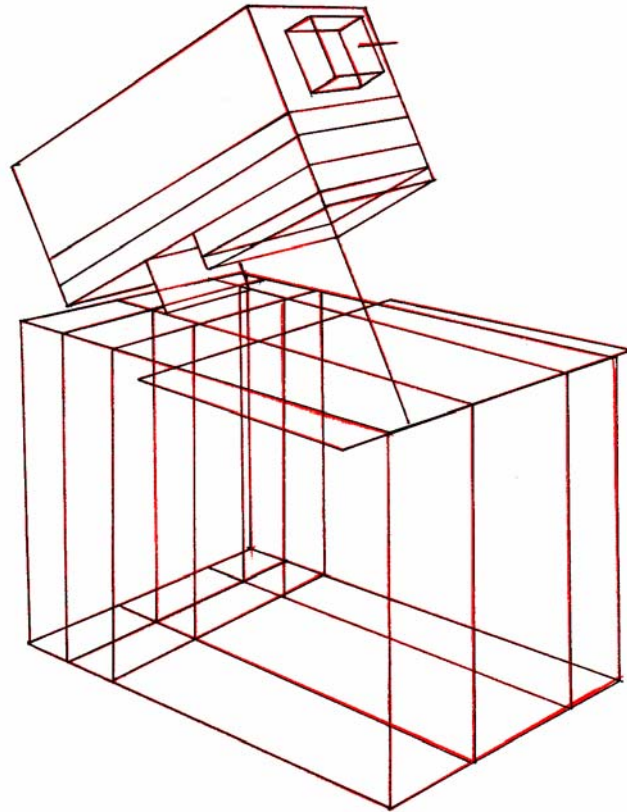
Drawing A Product

Process



Drawing A Product

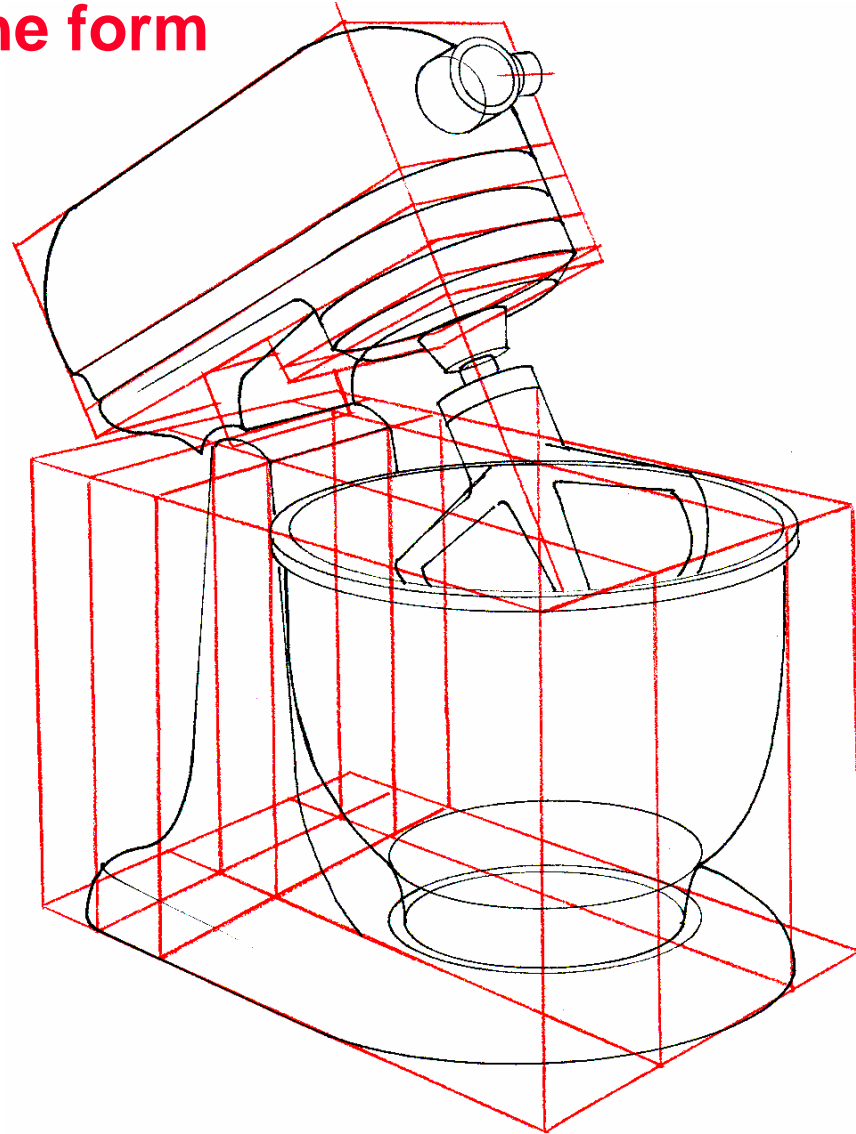
Step 1: Block out proportions



you may want to create an underlay

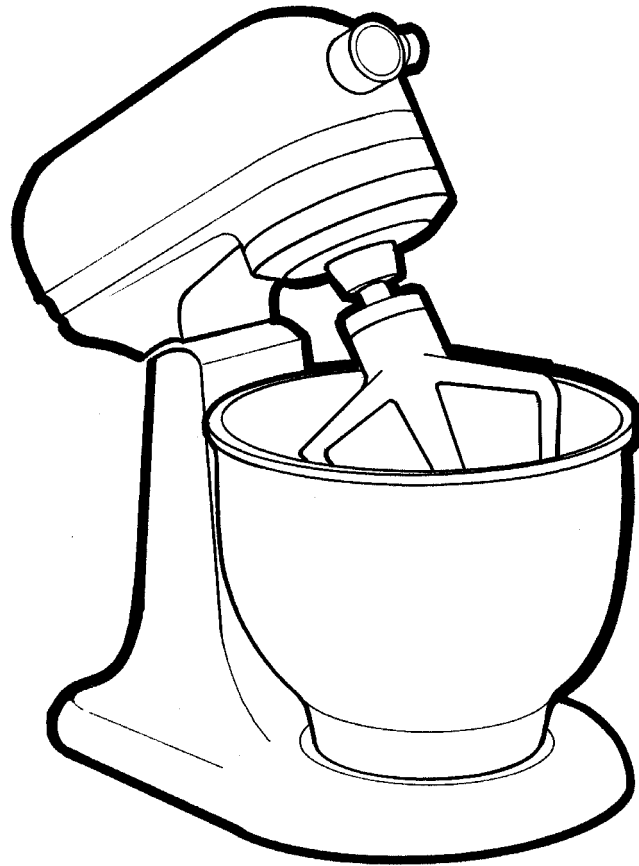
Drawing A Product

Step 2: Sketch in the form



Drawing A Product

Step 3: Sketch in the form



on an overlay?

Sketching Process

2D or 3D

Block out (position, proportions)

H pencil

Necessary detail

H Pencil

Darken in

fine liner (hidden and low visibility)

sign pen (interior)

chisel (exterior)

Exercise

Make a 16.810 underlay

Block out full scale (grid)

Necessary detail (hard points, freedom, forbidden zone)

Darken in

fine liner (freedom)
sign pen (hard points)
chisel (forbidden)

