



3D DESIGN PRINCIPLES

DIMENSION

1D line

2D shape / image

3D space

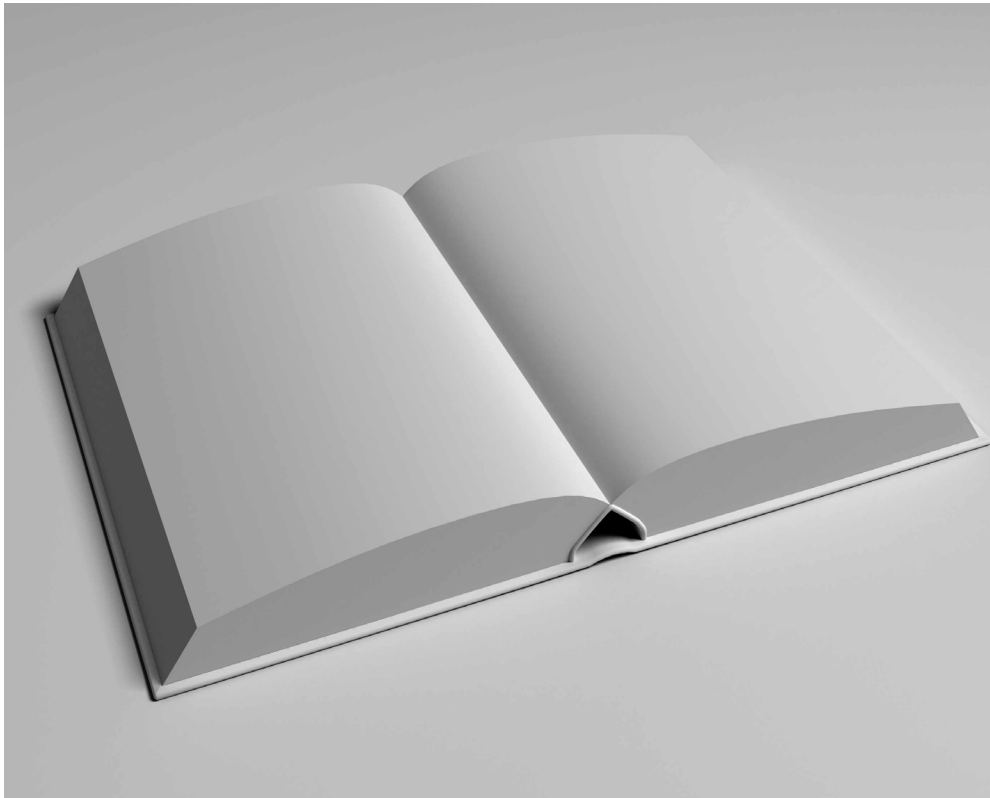
4D time

5D behavior

FORM & CONTENT

Form is the purely visual aspect.

Content implies the subject matter, story, or information the designer seeks to communicate to the viewer.



A. Form

Flemish envoys commissioned to conclude the marriage treaty between the Dauphin and Margaret of Flanders—had made its entry into Paris, to the great annoyance of Monsieur le Cardinal de Bourbon, who, to please the king, had been obliged to give a gracious reception to that rude train of Flemish burgomasters, and entertain them, at his Hôtel de Bourbon, with one of the rude dramatic exhibitions of the time, while a beating rain drenched the magnificent tapestry at his door.

But on the 6th of January, that which set in motion the whole *populaire* of Paris, as old Jean de Troyes tells us, was the double holiday, united since time immemorial,—the Kings' Day and the Festival of Fools.

On that day a bonfire was to be made in the Place de Grève, a maypole planted at the Chapelle de Braque, and a mystery performed at the Palais de Justice. Proclamation to that effect had been made the day before, by sound of trumpet, at the crossings of the streets, by the provost's men, dressed in fine sleeveless frocks of violet-colored camlet, with large white crosses on the breast.

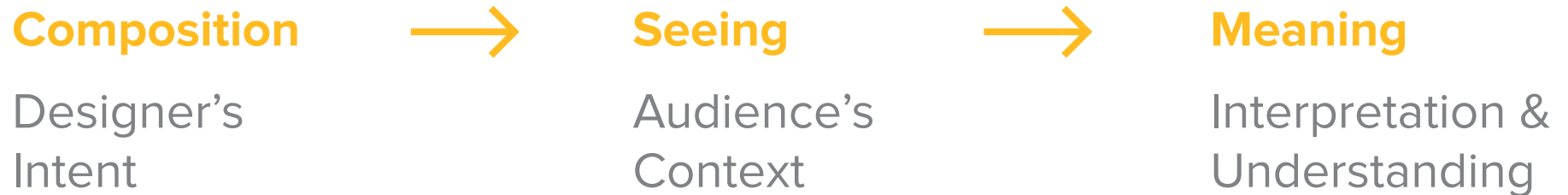
The crowd of people accordingly set out in the morning from all quarters of the town, leaving houses and shops shut up, towards one of the three places appointed. Each one had made his choice, for the bonfire, the maypole, or the mystery. It must be said, however, to the praise of the ancient good sense of the Parisian cockneys, that the greater part of the multitude directed their steps towards the bonfire, which was perfectly seasonable, or to-

B. Content



René Magritte, *The Treachery of Images* (1928), oil on canvas, 25" × 37"

VISUAL COMMUNICATION



Meaning is relative, it varies from culture to culture and changes over time. It is an interpretive act, requiring effort on the part of the viewer.

The ability to create meaning comes from using common visual syntax.

HAPTIC (TOUCH)

Haptic is form of nonverbal communication involving touch, or the experience of touch. It plays an important role in experiencing the 3D world.

The first learning experience of a child is through tactile awareness, followed by smelling, hearing and tasting.

Your appreciation of a good hammer is likely to be more tactile than visual—e.g. feel, weight, balance.

LEARNING TO SEE

The previous senses are quickly augmented and superseded by the ability to see, to recognize and understand environmental and emotional forces visually.

To expand our ability to see means to expand our ability to understand a visual message and, even more crucial, to make a visual message.

CONTEXT

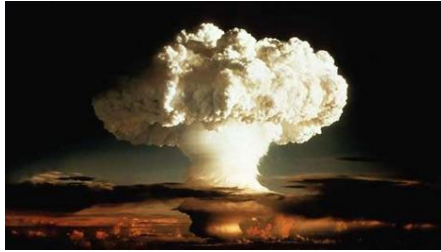
How we view the world affects what we see, and we all view it differently.

PSYCHOLOGICAL



Our individual emotions and perceptions.

CULTURAL



What we have learned from cultural experiences.

ENVIRONMENTAL



Physical surroundings around us and/or the object.

CREATIVE PROBLEM SOLVING

Design is a creative field because there are no predetermined answers to the problems. However, visual literacy is required to deliver meaning that is able to be recognized and understood.

The ultimate goal of design is to communicate visually with intent and meaning.

SOURCES FOR IDEAS

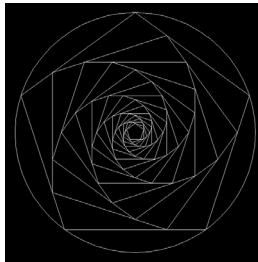
An idea can take many forms, varying from a specific visual effect to an intellectual communication of a message. Source material can come from anywhere; it need only to inspire and generate creative energy.

NATURE



The ultimate source for geometry, organic forms, color, texture, etc.

GEOMETRY



Mathematical shapes and angles of the built and natural world.

CULTURE



The objects, people, and situations that explain the way we live.

HOW DO WE VISUALIZE?

We express and receive visual messages on three levels:

REPRESENTATION

Imitations from our environment and experience.

ABSTRACT

Image or object reduced to the basic elemental visual components, emphasizing a direct, emotional message.

SYMBOLIC

Man made symbol systems which we have attached meaning.



DESIGN ELEMENTS

Dot	Form
Line	Mass / space
Shape	Plane
Direction	Time / Motion
Color	Dimension
Texture	Scale

The design elements are manipulated with shifting emphasis. The most dynamic visual technique is contrast.

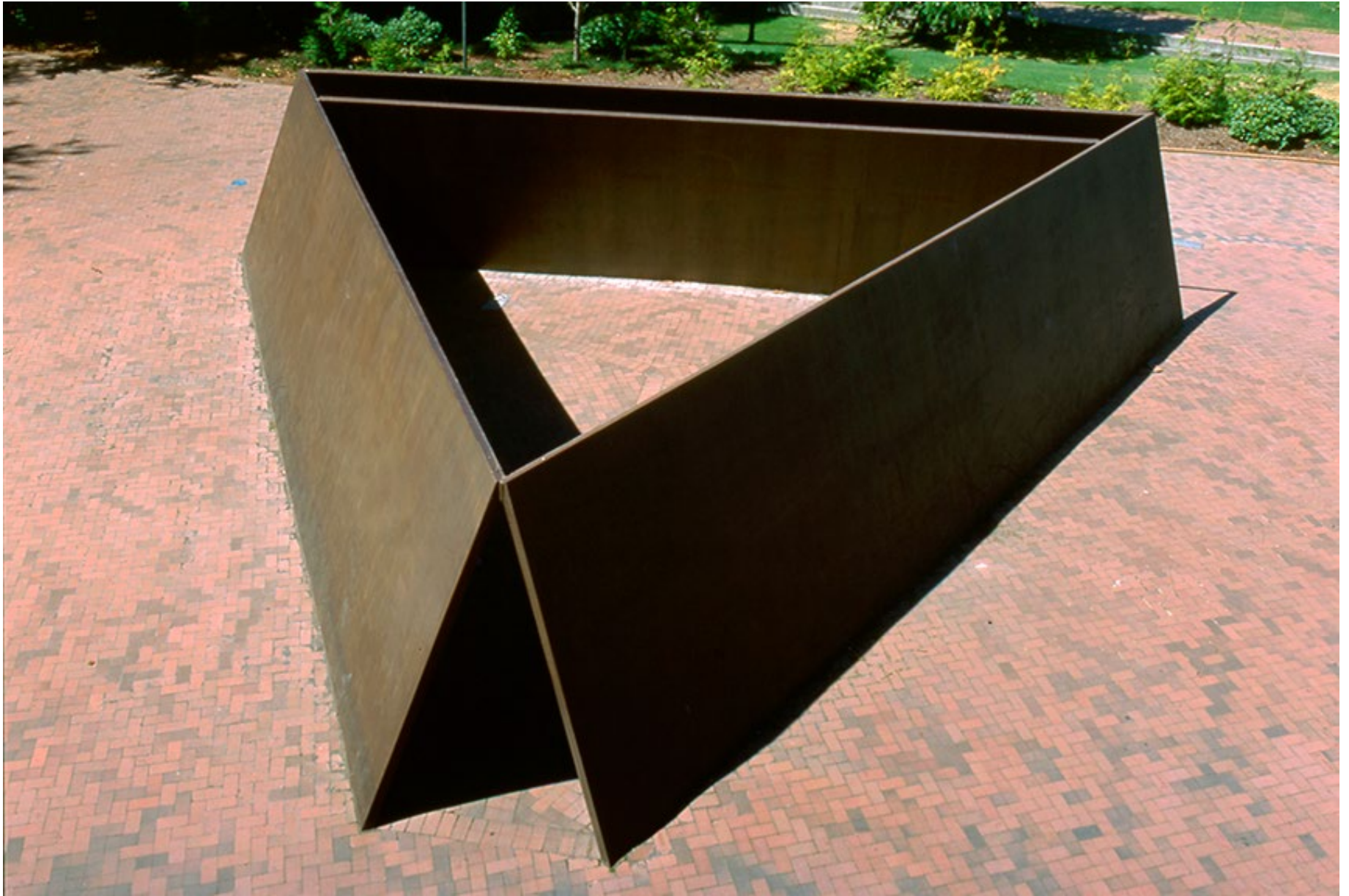
FORM

Form is the overall 3D shape of an object, the complete configuration of its mass. The word form—or, **formal**—is also used to describe all visual/structural aspects of an object.

Form is powerful. We empathize with its characteristics such as **curvilinear**, **geometric**, **concave**, **convex**, **static**, and **dynamic**. It can also have an interior and exterior or pockets of negative space.



Richard Serra, *Sequence* (2006), weatherproof steel. 12'9" x 40'8 3/8" x 65' 2 3/16"



Richard Serra, *Wright's Triangle* (1978), corten steel. 9' x 42 3/4'

FORM FOLLOWS FUNCTION

Form follows function is a principle associated with modern architecture and industrial design in the 20th century. The principle is that the shape of a building or object should be primarily based upon its intended function or purpose. This is also seen in nature—e.g. flowers, and can be translated to any designed object intended for functional use—e.g. airplanes, paper clips, tablets.

Ergonomics engages the idea that designed objects must interact compatibly with the user's body—e.g. ski poles, game controller, chair.



MASS AND SPACE

Mass is a body of matter, a collection of incoherent particles, parts, or objects regarded as forming one body.

Space is the negative or interstitial realm surrounding or enclosed by mass.

Mass and space always exist in tandem, matter defines a space—whether an object is pierced by voids or is an object surrounded by space.



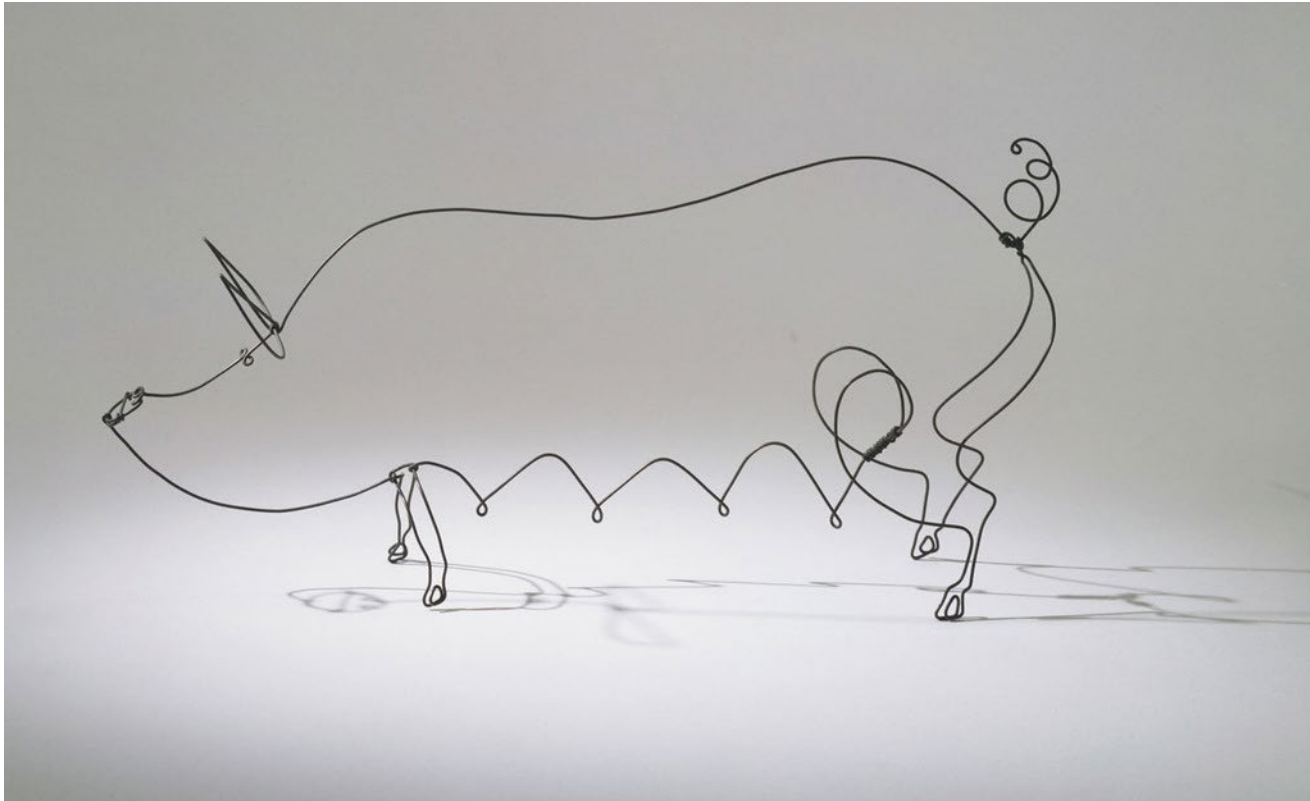
Beijing National Stadium (2008)

LINE

Line—made up of points—is one of the simplest elements in design. Line is a dynamic element expressing gesture or direction, activating the space that surrounds it.



Charles Ray, *Ink Line* (1987), ink and pump

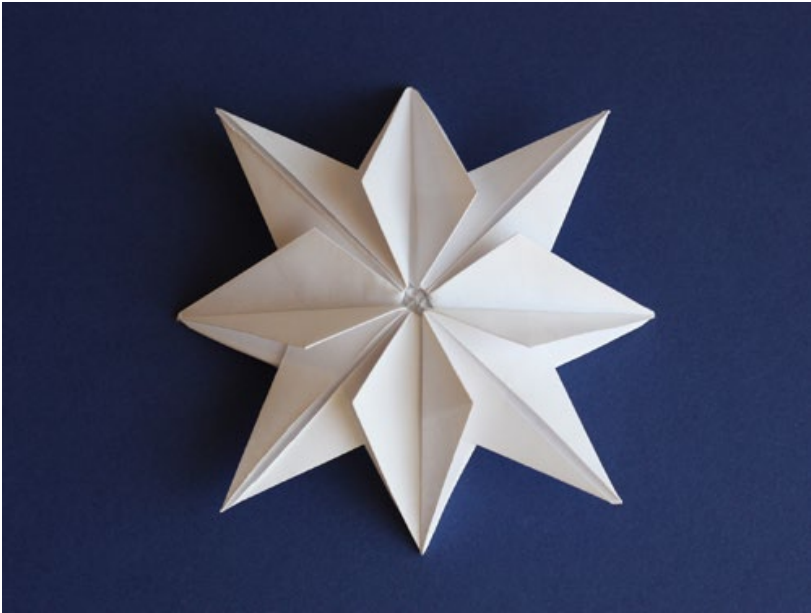


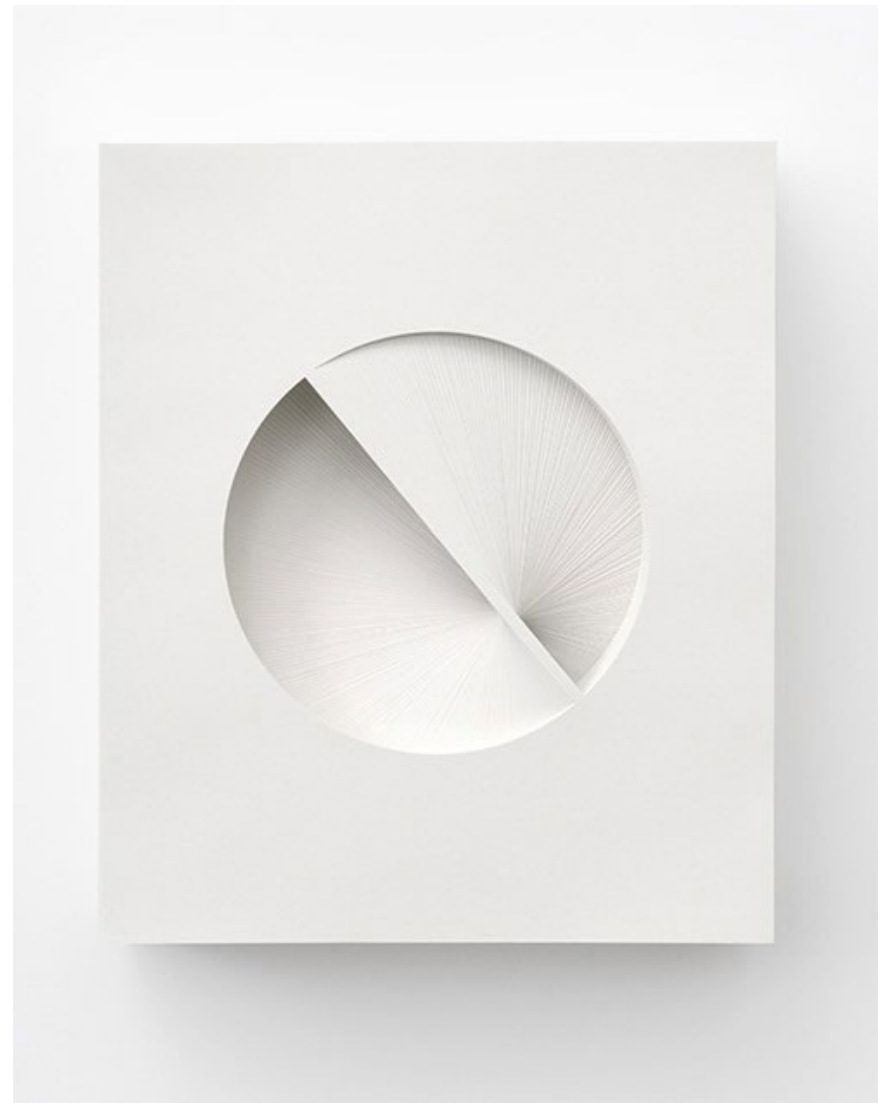
Alexander Calder, Sow (1928), wire construction, 7.5" x 1.5" x 3"

PLANE

Planes are flat surfaces generated by a moving line. They are ubiquitous design elements: the walls of your house, paintings on a wall, paper. The built world is planar and geometric.

3D form may be generated by 2D planar materials—e.g. packaging and origami.





Bianca Chang, *Form in white (Double prism) & Form in white (Rotation IV)*, 2012, paper

TEXTURE

Surface is one of the first characteristics of form perceived by a viewer. **Texture** is that aspect of a surface that we can experience tactilely.

Texture is contextual—i.e. smooth is smoother when contrasted with rough



Pini Leibovich, *Happy Material* (2005), balloons.



Anish Kapoor, *Cloud Gate* (2004), 33'.

COLOR

Intrinsic color refers to objects that retain natural color of the material that forms them.

Applied color therefore is applied to surfaces—e.g. painting, glazing, coated, enameled, oxidizing, etc.

COLOR

Color is a property of light, not an object itself. Objects have no color of their own but merely the ability to reflect certain wavelengths of light.

Additive color is created by mixing (or “adding”) *light* of two or more different colors. Red, green, and blue are the additive primary colors normally used in additive color system.

Subtractive color is created from *pigments* or *dyes*. When light hits the surface, the pigment absorbs (or “subtracts”) all the color components except for that color.

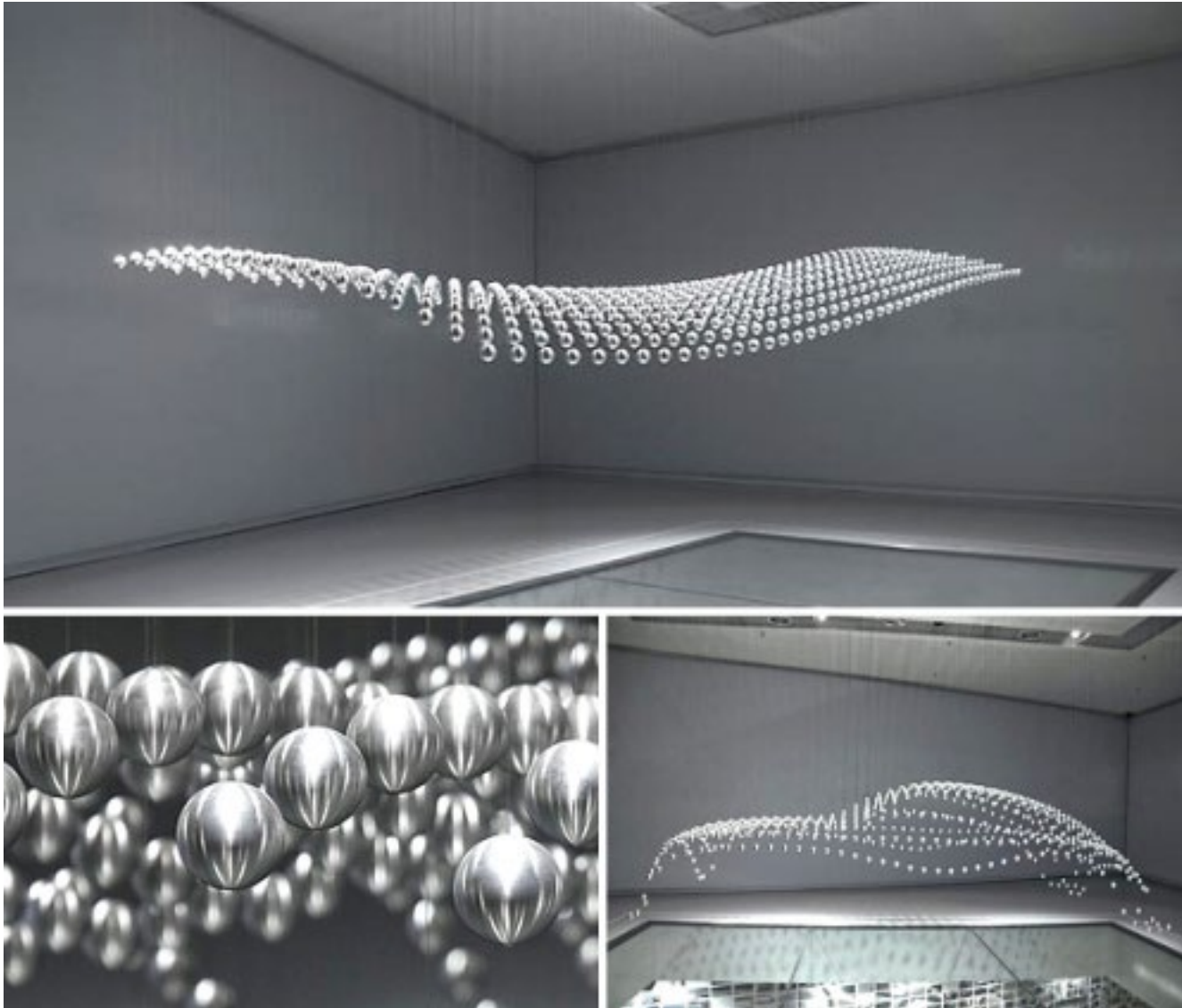
TIME AND MOTION

Motion can be an illusion or kinetic, which utilizes time and motion directly.

Angles, direction, kinetic movement, line, and sound can emphasize motion.



Dawn Ng, *I Fly Like Paper* (2009), installation



Joachim Sauter, *Kinetic Sculpture BMW* (2008), installation