

25 Golden Ratio

Wednesday, April 05, 2017 3:19 PM

Provide / music selection for playlist

Today

Schedule

Expo registration

~~Nagging~~ *Encouragement*

60*3/50=3.6

Sketching

Golden Ratio

Chairs 1: The Eames lounge chair

11	March 27 Break	Break	Break
12	April 4 UPD: Anthropomorphic effects	Geometric Aesthetics UPD: symmetry, thirds, Fibonacc, Golden Ratio Blog: Construction timeline	Case Study: The Chair, The Eames Lounge chair
13	April 10 Case Study: The Chair, The Ubiquitous Monoblock, Other current chair designs	Current designers: Philippe Starck, Ross Lovegrove, Karim Rachid, Yves Behar, Martha Stewart Blog: Main Project Final Stretch Progress	Current designers: Steve Jobs and Jonny Ives Registration for Expo due
14	April 17 Design award winners	Project/ Team Time. Prof H. available for consultations Blog: None	Project/ Team Time. Prof. H available for consultations.
15	April 24 Final Presentations to Pod, same pods as for design review. Post a video or link to video of your presentation attached to this week's blog post. <i>blog title for in-class critiques</i>	Final Presentations to Pod Blog: Final Project Report: What and How. Overall description and photos, then details of what you have made: CAD drawings, fabrication description, costs vs budget, etc.	Final Presentations to Pod/ Party ITLL Expo Saturday April 29
16	May 1 Final Presentations to Pod, same pods as for design review. Post a video or link to video of your presentation attached to this week's blog post.	Final Presentations to Pod ATLAS Expo Blog: Final Project Report Continued: Why and What next? Reflection on the semester. Compare your original project intent to what you ended up with. How did the public react? What did you learn from your project, and from the class? What will you do next with the project? What do you wish you had done differently?	Final Presentations to Pod/ Party
17	May 7 (Sunday) Critiques of final reports due	Weds May 10 Final revisions due	

ITLL Expo Registration is open now, and will close at 4:00pm on Friday, April 14th. Please register ASAP. Each of you should register as an individual.

https://docs.google.com/forms/d/e/1FAIpQLSe5F4X22zBs4b3S4G8yBQ8Z6l_4kZcvTBIE2d5A5TDV-29Odw/viewform?usp=send_form

Exhibiting at ITLL Expo is REQUIRED. The Atlas expo is optional; we are only allowed a few slots there. Let me know if you are interested to exhibit there too.

ITLL Expo registration form preview:

ITLL **Engineering Design Expo Registration**

Registration Deadline: Friday, April 14th at 4:00pm

No late registration will be accepted.

*** Required**

Team Name *

Project Name: *

Number of Members *
 (including yourself)

Project Description: *

Engineering Design Expo Registration

Registration Deadline: Friday, April 14th at 4:00pm

No late registration will be accepted.

* Required

Team Name *

hertzberg test

Project Name: *

hertzberg test

Number of Members *

(including yourself)

50

Project Description: *

Please provide a short (but detailed) paragraph describing your project.

Test registration before I send link to my students

Point of Contact Email *

Choose one student to be the representative of your group for communicating with Design Expo coordinators. The Point-of-Contact person is responsible for passing on information to the other team members.

hertzberg@colorado.edu

Names and emails of all team members, including yourself *

Please spell names correctly, and use the format "Last, First, email"

hertzberg@colorado.edu

Course Affiliation *

- ASEN 1400
- COEN 1400
- COEN 1410
- EOEN 1400
- GEEN 1400
- GEEN 2400
- GEEN 3400
- GEEN 4400
- Senior Design
- Flow Visualization
- Aesthetics of Design
- Centaurus High School
- Skyline High School
- Other:

If you are in senior design, what is your major?

X

Faculty advisor or instructor name *

Some instructors have two sections - make sure you pick the right one!

Aesthetics of Design Hertzberg

Continue >

25% completed

Powered by
Google Forms

This content is neither created nor endorsed by Google.
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Engineering Design Expo Registration

Engineering Design Expo Registration

Team Information

Location assignments are made according to the size and requirements of each project.

Projects that require running water or are very large, messy, or noisy will be located outside. Only extreme weather conditions on the day of Expo will result in moving outside projects indoors. Teams should consider how or if the weather may affect their presentation (clouds, wind, rain, snow).

Carefully consider what items may be needed to showcase your project when filling out this form. Teams are responsible for providing extension cords, hoses, and chairs if needed (you may check these items out from Kai in the check-out office, but be sure to make arrangements ahead of time).

You may NOT move your project once the location assignment is made without permission of an Expo coordinator.

Questions

Direct any questions to Victoria Lanaghan (303-492-7222) in the ITLL admin office 1B40.

Your Point-of-Contact will be notified by e-mail that your registration form was received.

 50% completed

Powered by


This content is neither created nor endorsed by Google.
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Engineering Design Expo Registration

Special Requirements

The following questions concern any special requirements that your team may have for the day of Expo. These include requests for things you cannot provide for yourselves (such as a power outlet or a table) and also information for us to help us assign your expo location (for example, needing sunlight for a solar project).

All special requests MUST be included on this form to be accommodated.

Please note: the ITLL does not provide boards for your posters.

 75% completed

Powered by


This content is neither created nor endorsed by Google.
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Engineering Design Expo Registration

* Required

Special Requirements

Describe what you will be bringing to Expo. *

Include a thorough description of all hardware, posters, etc. with dimensions for everything (ex. a car, 2ft. x 1ft., 9 in. tall)

Provide STAGING

Power outlet or power strip: How many outlets do you need? *

This does not include extension cords: you will need to make arrangements with Kai in 2B14 if you need an extension cord.

- 0
- 1
- 2
- Other:

Do you need access to water? *

Please explain in detail why you need water, how much you need, and what sort of container it will be in (you must provide the container).

Do you need special lighting (or darkness)? *

If yes explain what you need and why

Do you need a table? *

- No, our project is free standing and we do not need a table of any kind.
- No, we do not need a table. But, we do need an easel, please! (poster board not provided)
- Yes, we need a small table to put our project on. A lab station or cabaret table will be large enough.
- Yes, we need a medium (3x3) table to rest our project on.
- Yes, we need a large (3x6) table to rest our project on.
- Other:

What will be on your table? *

If no table needed, please write "none".

Do you need access to an ITL LabStation? *

If yes explain what you need and why

Do you need an outdoor location (needs sunlight, cannot bring inside, etc.)? *

If yes explain why

Do you have a project foot print greater than 9 sq ft? *

If yes explain the size of your project, how much space you think you need, and what will be in that space

Do you need compressed air? *

If yes explain why and specify pressure

Describe the noise level of your project. *

Include a rating from 1-5 of how noisy you think your project is, and a description of the noise.

Do you have any other considerations (messy, requires a door, etc.)? *

If yes explain these considerations

Describe the noise level of your project. *

Include a rating from 1-5 of how noisy you think your project is, and a description of the noise.

Do you have any other considerations (messy, requires a door, etc.)? *

If yes explain these considerations

Do you have a location preference? If yes, where would you like to be?

- We are flexible and have no preference.
- ITLL 01 Level
- ITLL 1B Level
- In a Group Study Room
- ITLL/DLC Bridge
- DLC 01 Level
- DLC 1B Level
- DLC Collaboratory
- Engineering Center Lobby
- Outside
- Other:

[← Back](#)

[Submit](#)

100%: You made it.

Never submit passwords through Google Forms.

~~Nagging~~ *Encouragement*

The '20th Century Design Movements' blog is very important; shows your mastery over much of the course content. Make this a strong post. Discuss WHY your choices fit a certain major movement/aesthetic. Do a little research; lecture notes are just to get you started. You will also learn by doing your critiques; these are important for you and for who you are critiquing.

Sketching

2.6 PLANES & SECTIONS

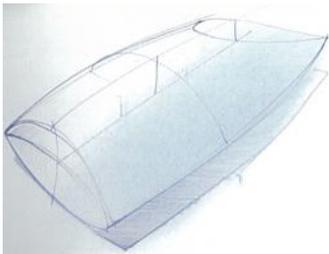
When a drawing is based on sections or planes, the biggest surfaces and sections are drawn first. They also serve well in keeping the shape symmetrical.

The idea sketches of a tent are started with the bottom surface, on which the vertical sections are drawn.

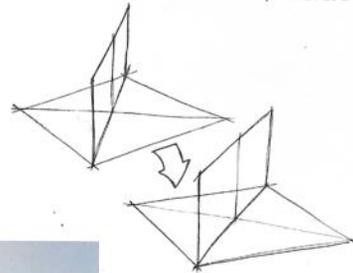
To maintain a transparent appearance, a combination of pastel chalk and colour pencil is used for cast shadow and shading. In this way, the sections, drawn with ballpoint, are kept quite visible. This is necessary, as they are the basis of the tent's structure, and needed as input for further design stages.



44

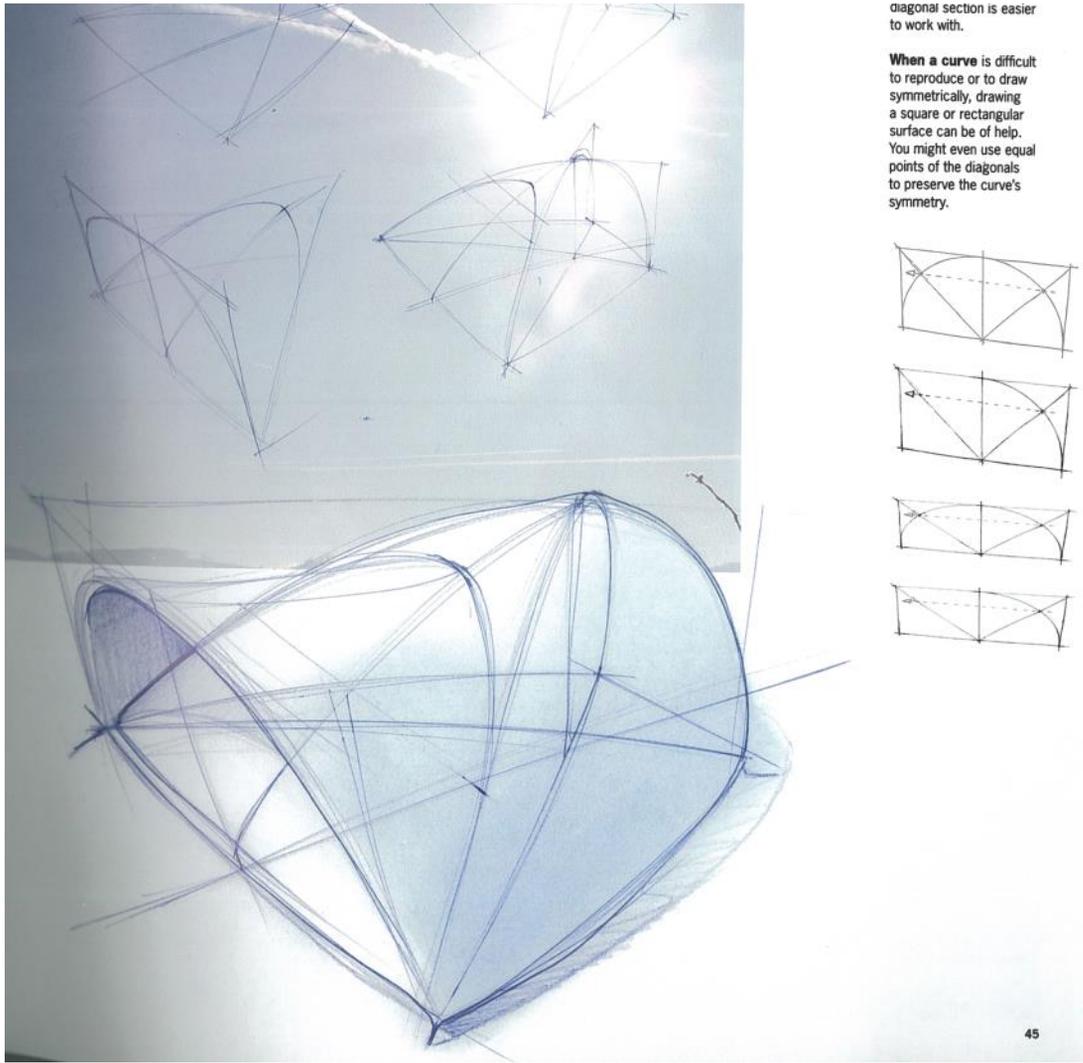


CHAPTER 2 DRAWING APPROACH / 2.6 PLANES & SECTIONS



When the viewpoint is slightly altered, this diagonal section is easier to work with.

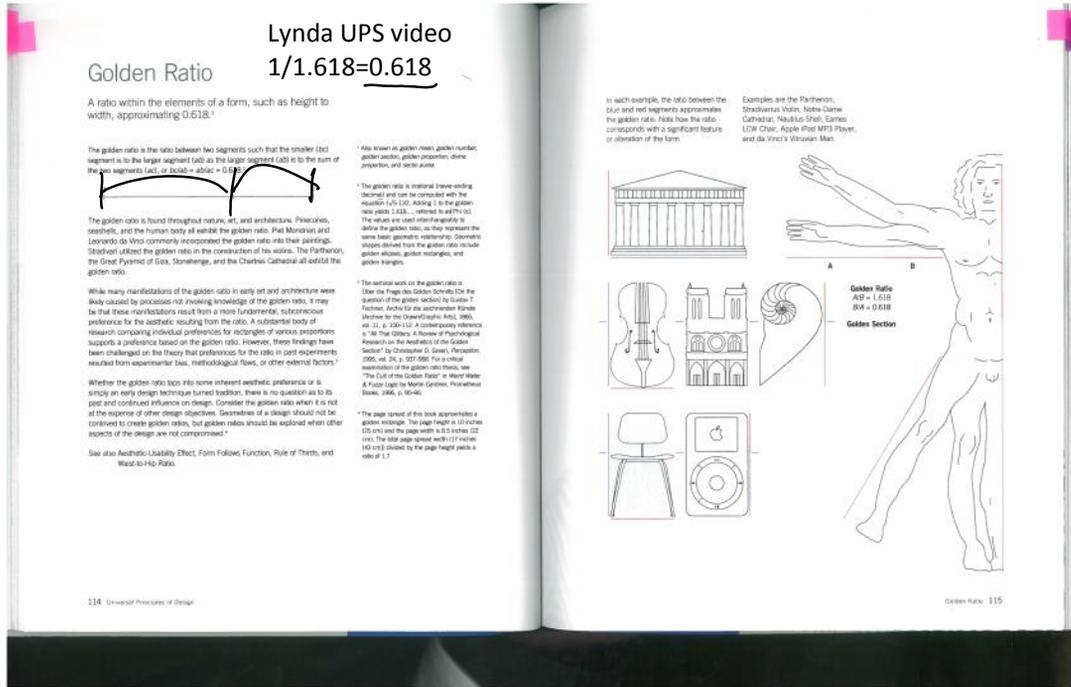
When a curve is difficult to reproduce or to draw symmetrically, drawing



diagonal section is easier to work with.

When a curve is difficult to reproduce or to draw symmetrically, drawing a square or rectangular surface can be of help. You might even use equal points of the diagonals to preserve the curve's symmetry.

Geometric Aesthetics: Last one Golden Ratio



Lynda UPS video
 $1/1.618=0.618$

Golden Ratio

A ratio within the elements of a form, such as height to width, approximating 0.618!

The golden ratio is the ratio between two segments such that the smaller (red) segment is to the larger segment (red) as the larger segment (red) is to the sum of the two segments (red). $a/b = (a+b)/a$ or $a^2 = b(a+b)$

The golden ratio is found throughout nature, art, and architecture. Phidias, Leonardo, and the human body all exhibit the golden ratio. Phidias and Leonardo da Vinci commonly incorporated the golden ratio into their paintings. Stravinsky utilized the golden ratio in the construction of his works. The Parthenon, the Great Pyramid of Giza, Stonehenge, and the Chartres Cathedral all exhibit the golden ratio.

While many manifestations of the golden ratio in early art and architecture were likely caused by processes not involving knowledge of the golden ratio, it may be that these manifestations result from a more fundamental, subconscious preference for the aesthetic resulting from the ratio. A substantial body of research comparing individual preferences for rectangles of various proportions supports a preference based on the golden ratio. However, these findings have been challenged on the theory that preferences for the ratio in past experiments resulted from experimenter bias, methodological flaws, or other external factors.³

Whether the golden ratio taps into some inherent aesthetic preference or is simply an early design technique turned tradition, there is no question as to its past and continued influence on design. Consider the golden ratio when it is not at the expense of other design objectives. Geometries of a design should not be confined to create golden ratios, but golden ratios should be explained when other aspects of the design are not compromised.⁴

See also Aesthetic Usability Effect, Form Follows Function, Rule of Thirds, and West-to-Hip Ratio.

³ Also known as golden mean, golden number, golden section, golden proportion, divine proportion, and section aurea.

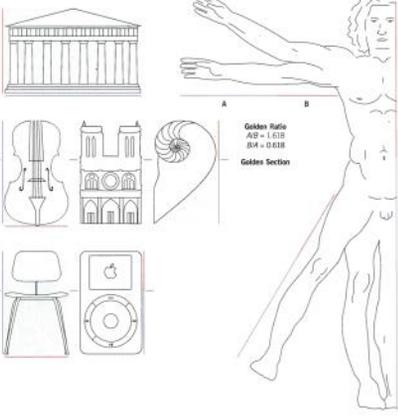
⁴ The golden ratio is a natural base ending diagonal and can be considered with the equation $(\sqrt{5} + 1)/2$ (AKA ϕ) to the golden ratio equals 1.618... related to $\phi^2 = \phi + 1$. The values are used interchangeably to define the golden ratio, so they represent the same basic geometric relationship. Geometric shapes defined from the golden ratio include golden ellipses, golden rectangles, and golden triangles.

⁵ The seminal work on the golden ratio is Leon Battista Alberti's *De Re Aedificatoria* (On the Art of Building in Ten Books) by Luca Pacioli, written for the mathematician Luca Pacioli by the Dominican monk Hieronymus Cardano in 1509. The *Golden Ratio: A Review of Psychological Research on the Aesthetics of the Golden Section* by Christopher D. Green, Perception, 2005, vol. 34, p. 207-208. For a critical reappraisal of the golden ratio theory, see "The Cult of the Golden Ratio" by Hans-Martin Wegmann, *Journal of Mathematical Psychology*, 2004, p. 50-60.

⁶ The page spread of this book approximates a golden rectangle. The page height is 11.2 inches (28.5 cm) and the page width is 7.5 inches (19.1 cm). The left page spread width (17 inches (43.2 cm)) divided by the page height yields a ratio of 1.7.

In each example, the ratio between the blue and red segments approximates the golden ratio. Note how the ratio corresponds with a significant feature or alteration of the form.

Examples are the Parthenon, Stravinsky's *Volga, Volga*, Heide-Clara Cathedral, Nautilus Shell, Gaudí's Guggenheim Museum, Apple iPod MP3 Player, and da Vinci's Vitruvian Man.



For a = longer part, and b = shorter part of a line, Golden ratio = a/b=a+b=1.618

For a = longer part, and b = shorter part of a line, Golden ratio = $a/b = a+b = 1.618$

$$\frac{1}{1.618} = 0.618$$

Related to Fibonacci series:

They are intimately connected with the [golden ratio](#); for example, the [closest rational approximations](#) to the ratio are $2/1, 3/2, 5/3, 8/5, \dots$

i.e. you get close to the Golden Ratio when you divide $\frac{F_n}{F_{n-1}}$
From https://en.wikipedia.org/wiki/Fibonacci_number

Where fibonacci is defined by

In mathematical terms, the recurrence relation

$$F_n = F_{n-1} + F_{n-2};$$

with seed values^{[1][2]}

$$F_1 = 1, F_2 = 1$$

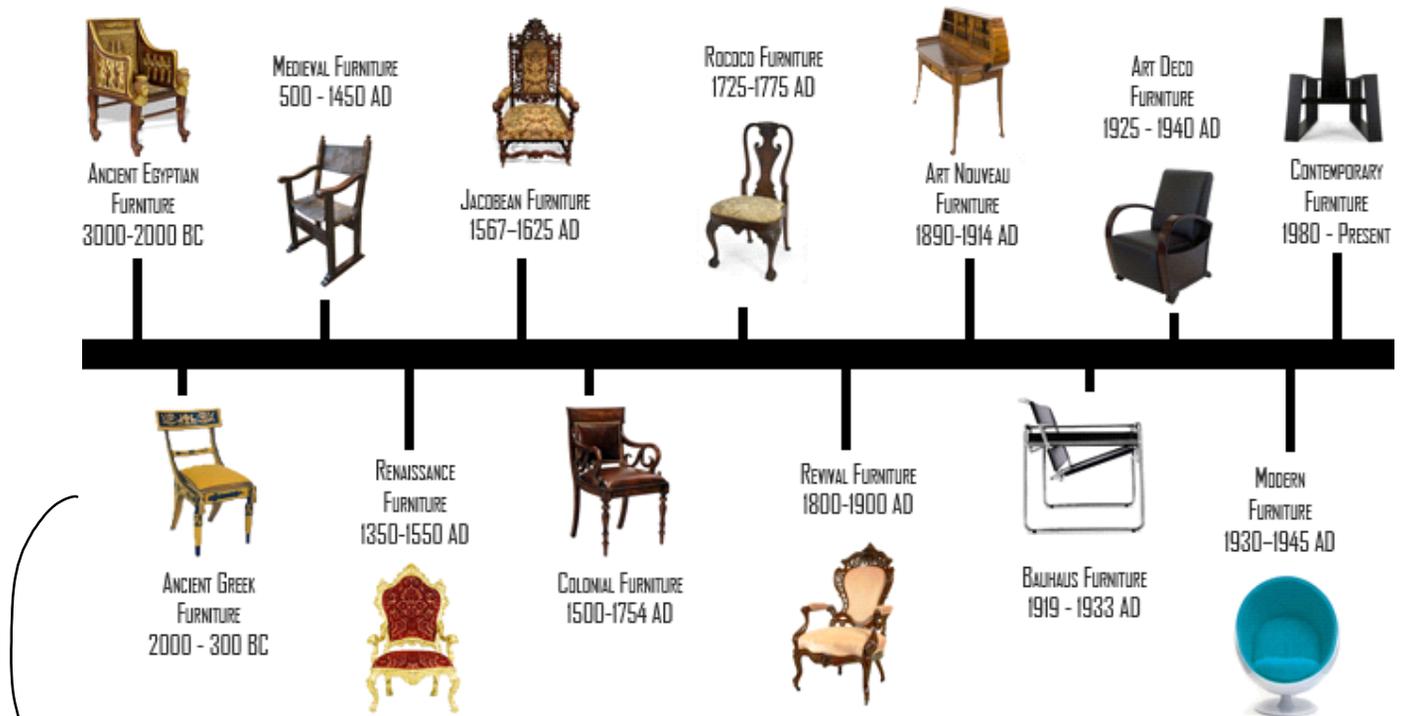
or^[5]

$$F_0 = 0, F_1 = 1.$$

Case Study: The Chair

Design Movements in Furniture

<http://www.onlinedesignteacher.com/2016/02/furniture-design-history.html> Has additional examples and closeups



What are the elements that define each one? Visual, materials, fabrication techniques, philosophy?

<http://www.connectedlines.com/styleguide/index.htm> has details of pre-1920 styles. Chippendale etc. Not the same categories as above.

<http://www.furniturestyles.net/> Another timeline with examples. More text, not so many images.

Prehistoric
Ancient Egyptian
Ancient Greek
Medieval
Renaissance
Jacobean <http://www.furniturestyles.net/european/english/jacobean.html>
Colonial
Rococco
Revival
Arts and Crafts?
Art Nouveau
Bauhaus
Art Deco
Modern
Contemporary

Modern Chairs

20th Century +

<http://www.design-museum.de/en/collection/100-masterpieces.html> Vitra Design Museum site. Basel, Germany.

Modern design is a bit personality driven. The Design Encyclopedia is nothing more than a list of designers and who they worked for/with.

Byars, Mel. *The Design Encyclopedia*. Laurence King Publishing, 2004.

OK, fine, so let's look at specific designers:

Charles and Ray Eames, husband and wife, members of Mid Century Modern/Organic design movement. Pioneered fiberglass and molded plywood seating. Many designs for huge furniture manufacturer Hermann Miller (Grand Rapids, MI). Eames Intro: <http://www.eamesoffice.com/eames-office/charles-and-ray/>

Organic: Incorporated user experience philosophy (the good host, providing comfort) with pioneering manufacturing process; formed plywood shells + upholstery

You have probably sat in this at an airport:



Eames Tandem Sling, by [Herman Miller](#). Still available new. Aluminum frame, vinyl fabric. 2 seater \$4200 up to 47 seats for \$24K. Refurbished with leather, \$6K on Etsy. I always try to sit in these at airports; they fit me.

<https://www.cooperhewitt.org/2017/01/10/title-to-comees108-sofa/>



ES 108 sofa

Eames Lounge Chair and Ottoman (Hermann Miller part numbers 670/671)

Design notes <http://www.eamesoffice.com/blog/eames-lounge-chair-is-cared-for/>

Build process videos:

[How We Make the Eames Lounge Chair: Six New Films About the Classic, n.d.](https://www.youtube.com/watch?v=IBLMoMhIAfM&feature=youtu.be)

<https://www.youtube.com/watch?v=IBLMoMhIAfM&feature=youtu.be> Eames introduce the lounge chair on national TV, the Today Show, in 1956 . Long, and difficult for a feminist to watch.

Contrast the Eames Lounge chair to the Monobloc:

“Everybody Take A Seat.” *Smithsonian*. Accessed March 2, 2016. <http://www.smithsonianmag.com/people-places/everybody-take-a-seat-2386495/>.

Bryan Ropar. *Plastic Chair Collection Video From Tosh.O*, 2013. https://www.youtube.com/watch?list=PL0gsOtuiqLgT7k71oh5g44Gc29UyM_QZZ&time_continue=10&v=endP6hTviXE.

Wikipedia: The Monobloc chair is a lightweight stackable polypropylene chair, often described[by whom?] as the world's most common plastic chair.

Based on original designs by the Italian designer Vico Magistretti in 1967, variants of the one-piece plastic chair went into production with Allibert Group and Grosfillex Group in the 1970s. Since then, millions have been manufactured in countries including Russia, Taiwan, Australia, Mexico, the United States, Italy, France, Germany, Morocco, Turkey, Israel and China. Many design variants of the basic idea exist.[1]

The Monobloc chair is named because it is injection moulded from thermoplastic polypropylene, the granules being heated to about 220 degrees Celsius, and the melt injected into a mold. The gate of the mould is usually located in the seat, so ensuring smooth flow to all parts of the tool. The chairs cost approximately \$3 to produce, making them affordable across the world.

Social theorist Ethan Zuckerman describes them as having achieved a global ubiquity:

The Monobloc is one of the few objects I can think of that is free of any specific context. Seeing a white plastic chair in a photograph offers you no clues about where or when you are.

<http://www.demilked.com/creative-and-modern-chairs-2/> Post-Modern/Contemporary chairs



Red Chair (Free Shipping US) \$890.00

2016/11/19 00:59:59
TO FINISH THIS CAMPAIGN



ABOUT RED CHAIR
Using clean geometric lines in the composition of the chair; details and ornament were left out, to boldly create Red Chair.

Red chair, born from the conceptualization of a geometric primary form using only simple and pure lines, solving the structure with the same geometric shape.

<https://vitakora.co/deals/product/red-chair/>