

Lecture 2: Visual representation

Overview of the course

- Theory driven approaches to HCI
- **Design of visual displays**
- Goal-oriented interaction
- Designing smart systems (guest lecturer)
- Designing efficient systems
- Designing meaningful systems (guest lecturer)
- Evaluating interactive system designs
- Designing complex systems

Why talk about visual design?

Visual design questions are often where discussions about HCI start

“What colour should this be?”

“Should it be 5 pixels or 7?”

“Will this work for colour blind people?”

These conversations are a lot more complicated than they seem...

The range of visual representations

(See: “Visual representation” in “The Encyclopedia of Human Computer Interaction, 2nd Ed for a detailed narrative)

TYPOGRAPHY AND TEXT

The Grid System - Mozilla Firefox
 File Edit View History Bookmarks Tools Help
 http://www.thegridsystem.org/ typographic grid

egyptian statue, egyptian god, egyp... x The Grid System

The Grid System

The ultimate resource in grid systems.

"The grid system is an aid, not a guarantee. It permits a number of possible uses and each designer can look for a solution appropriate to his personal style. But one must learn how to use the grid; it is an art that requires practice."
 Josef Müller-Brockmann

Show Grid
 Join The Forum

Search

Articles

30 Grid-Based WordPress Themes

In this article we have 30 WordPress themes have been developed using a popular CSS Grid Frameworks such as the 960.gs, Blueprint, YUI2 and The Golden Grid.
 23.Aug.2010

Design & Build a Grid Based Web Design with CSS

Step by step walkthrough of the design and build process of a grid based WordPress theme. From the initial Photoshop concept, through development.
 23.Aug.2010

Long Live the 12-Column Grid

When I first crossed the great divide from print to web, one of the earliest things I tried to do was introduce a flexible multi-column grid (you know, like a magazine).
 07.May.2010

[View All Articles](#)

Tools

960 Grid System Photoshop Action

These actions will create a Photoshop document ideal for laying websites out in 12, 10, 8, 6 and 4 columns.
 23.Aug.2010

iPhone Grid System

A 12:8 (480:320) modular grid system for the iPhone, with the unit of 40px and the gutter of 5px.
 23.Aug.2010

Fluid Grid

A web grid system that allows designers to use the screen real estate on large monitors and retain great design on smaller ones.
 07.May.2010

[View All Tools](#)

Books

Universal Principles of Design

Universal Principles of Design is the first comprehensive, cross-disciplinary encyclopedia of design.
 04.Nov.2009

Designing for the Web

A Practical Guide to Designing for the Web has written explanations of the core principles of graphic design in relation to the web.
 08.Oct.2009

The Way of Typography

The book also goes into depth on how to create grid systems by hand with only pencil, straightedge and compass.
 18.Sep.2009

[View All Books](#)

Templates

The Golden Grid Template

A PSD template based on the CSS framework The Golden Grid by Vladimir Carrer.
 02.Mar.2010

Photoshop 4 Column Grid

A free 4 Column Photoshop grid template for a 1024x768 screen resolution by Ray Gulick.
 08.Jun.2009

InDesign 568x792 Grid System (12)

By Dario Galvagno. Adobe InDesign file with a grid system for a 568pts x 792pts page that is divided into 12 columns and rows using the Golden Ratio. Includes a 12pt baseline grid.
 16.Apr.2009

[View All Templates](#)

Blog

Forum is back up!

Sorry for the downtime on the forums. They're back up now.
 07.May.2010

Sushi & Robots

Beautifully personal portfolio by Jina Bolton that reveals the site grid and baseline grid.
 07.May.2010

Bisgrafic

Lovely grid site design by Barcelona based Bisgrafic.
 07.May.2010

[View All Blog Posts](#)

Inspiration

- Ace Jet 170
- AisleOne
- Athletics
- BBDK
- Blanka
- Build
- Corporate Risk Watch
- Counter Print
- David Airey
- Design Assembly
- Dirty Mouse
- Experimental Jetset
- Form Fifty Five
- Grafik Magazine
- Grain Edit
- Graphic Hug
- I Love Typography
- Lamosca
- Mark Boulton
- Minimal Sites
- Monocle
- Neubau
- NewWork
- OK-RM
- Original Linkage
- Robin Uleman
- SampsonMay
- Schmid Today
- September Industry
- Soulellis
- Subtraction
- Swiss Legacy
- The International Office
- Thinking for a Living
- This Studio
- Toko
- Typographic Posters
- Visuelle
- Xavier Encinas
- Year of the Sheep

Done zotero

Incipit epistola sancti ieronimi ad
paulinum presbiterum de omnibus
diu et hystorie libris capituli primi.

Hanc ambrosius
tua michi munus-
cula precor. deinde
sit et suavissimas
lras. q̄ a principio
amiciat. sic. pha-

et iam hda et veteris amicitie noua:
p̄cedant. Et ita mi illa necessitudo ē
et xpi glorio copulata. q̄m non vali-
tas et familiaritas. nō p̄ntia tantum
corporis. nō libola et palpās adulato-
sed dei amor. et diuina scripturarū
studia conuolant. legim⁹ in veteris
hystorie. quod d̄ iustitiae. p̄ntia a.
nouos adisse p̄los. maria et iuste.
ut eos quos et libris nouerant. corā
q̄ videret. Sicur piragoras mouphi-
nicos utros. sic plato egip̄i. et archimē-
tarcum. cantonq; oram ralis. que
quondā magna grecia dicebat. labo-
riose p̄ntia petaguit. et ut qui athenis
m̄p̄ erat. et potius. n̄m̄p̄ d̄ d̄ d̄ d̄
achadum gignasū p̄ntia d̄. h̄er
p̄ntia atq; discipulus. malēs aliana
veteris discere. q̄m sua sp̄ntia in q̄.
Deniq; n̄ lras quasi toto ore fugien-
tes p̄sequit. cap̄ a picatis et uenūda-
tus. orāno crudelissimo p̄ntia d̄.
cap̄ntia v̄ntia et seruis. Tamē quia
p̄ntia maior euenit se h̄re. ad oram
l̄ntia. l̄ntia eloquēcie fonte manantē.
et v̄ntia h̄ntia galli ar̄q; h̄ntia.
quod d̄ am uenisse nobiles legimus. et
quos ad d̄mplacōnē sui roma nō
causat. v̄ntia h̄ntia fama p̄ntia. Ha-
bit illa etas inauditi om̄ib; seculis.
celebrandūq; miracū. ut urbē tanta

ingressi. aliud terra urbem querebant.
Apollonii⁹ fuit ille mag⁹ ut vulgus
loquitur. fuit p̄ntia ut piragora na-
dunt. incauit plas. p̄ntia caucasi.
albanos. s̄ntia. mallagras. opulē-
tissima indie regna p̄ntia. et ad
p̄ntia lanissimo p̄ntia am̄p̄
n̄ntia p̄ntia ad braguanas. ut
braccam in throno sedent aucto et de
tantali fonte p̄ntia. inter paucos
discipulos. de natura. et morib; ac de
antū die; et h̄ntia audire docerant.
Iude p̄ntia. babilonios. chalde-
os. iudeos. al̄ntia. parthos. h̄ntia.
p̄ntia. arabes. palestinos. r̄ntia
ad alleaudriā. p̄ntia ad ethiopiā.
ut gignasū p̄ntia et famosissimam
solis mensam videret in sabulo. In-
uenit ille vir ubiq; q̄ disceret. et semp
p̄ntia. semp se melior fieret. Scrip-
sit super hoc planissime octo volumi-
nibus. phisosteano.

Quid loquar de seculi hominibus.
cū ap̄ntia paulus. vas decōntia.
et magister gentiū. qui de consuetudine
n̄ntia se hospitiis loquebat. dicebat. An
p̄ntia queras eius qui in me
loquit̄ xpi. Post damascū arabi; q̄
l̄ntia. al̄ntia iherosolimā ut videt
p̄ntia et m̄ntia apud n̄ diebus quindē.
H̄ntia n̄ntia abdo madis et ogdo
ad̄ntia. h̄ntia gentiū p̄ntia instru-
tus erat. Et v̄ntia post ānos quātor-
decim assumptis barnaba et oro. exp̄-
l̄ntia cū ap̄ntia cōntia. ut fore in va-
cuum curaret aut curaret. H̄ntia
n̄ntia q̄d latinis emerge. v̄ntia v̄ntia
ad̄ntia. et in aures discipuli de auctoris
ore manifeste. foreius sonat. Unde et
ethiomas cū rodi gulara. et legatur

$$i\hbar \frac{\partial}{\partial t} \Psi = -\frac{\hbar^2}{2m} \nabla^2 \Psi + V \Psi$$

IEEE Software: Behavioural Scier x nook-experimental - Database x +

console.firebase.google.com/u/1/project/nook-experimental/dat... ☆

Apps Offline Gmail AVF sustainability PRs Luke Lark Other Bookmarks

Firestore nook-experimental Go to docs L

Database

Cloud Firestore

Data Rules Indexes Usage

Home > conversationTa... > tag-0aa8b45a

nook-experimental	conversationTags	tag-0aa8b45a
+ Start collection	+ Add document	+ Start collection
conversationTags >	tag-0aa8b45a >	+ Add field
messageTags	tag-12be10d3	shortcut: "a"
nook_conversati...	tag-14ea0e13	text: "active case"
sms_raw_msgmap	tag-acc357d0	type: "TagType.normal"
suggestedReplies		
systemMessages		
tables		
translation_cac...		

Cloud Firestore location: eur3 (europe-west)

Develop

- Authentication
- Database
- Storage
- Hosting
- Functions
- ML Kit

Quality

- Crashlytics
- Performance
- Test Lab
- App Distribution

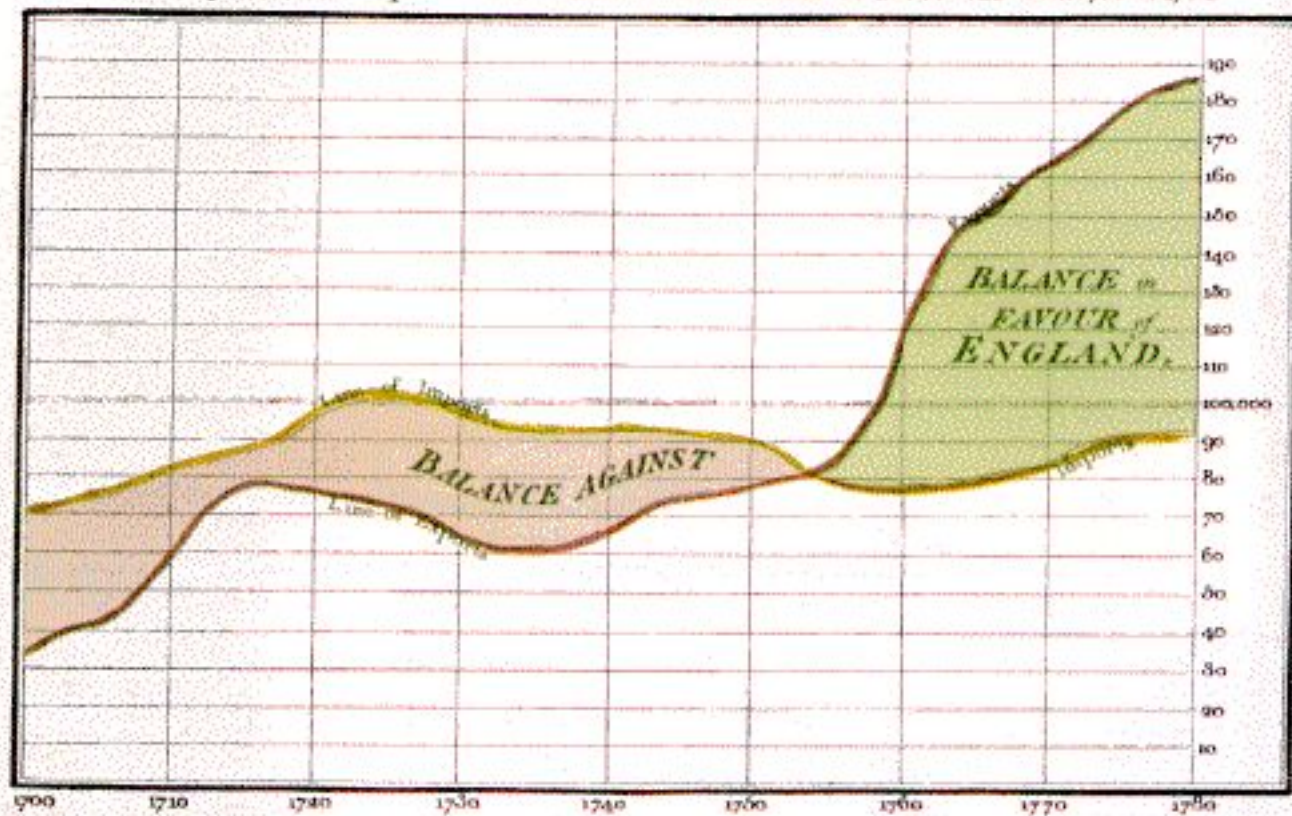
Analytics

- Dashboard
- Events
- Conversions
- Audiences
- Funnels
- User Properties
- Extensions

Blaze Modify
Pay as you go

MAPS AND GRAPHS

Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780

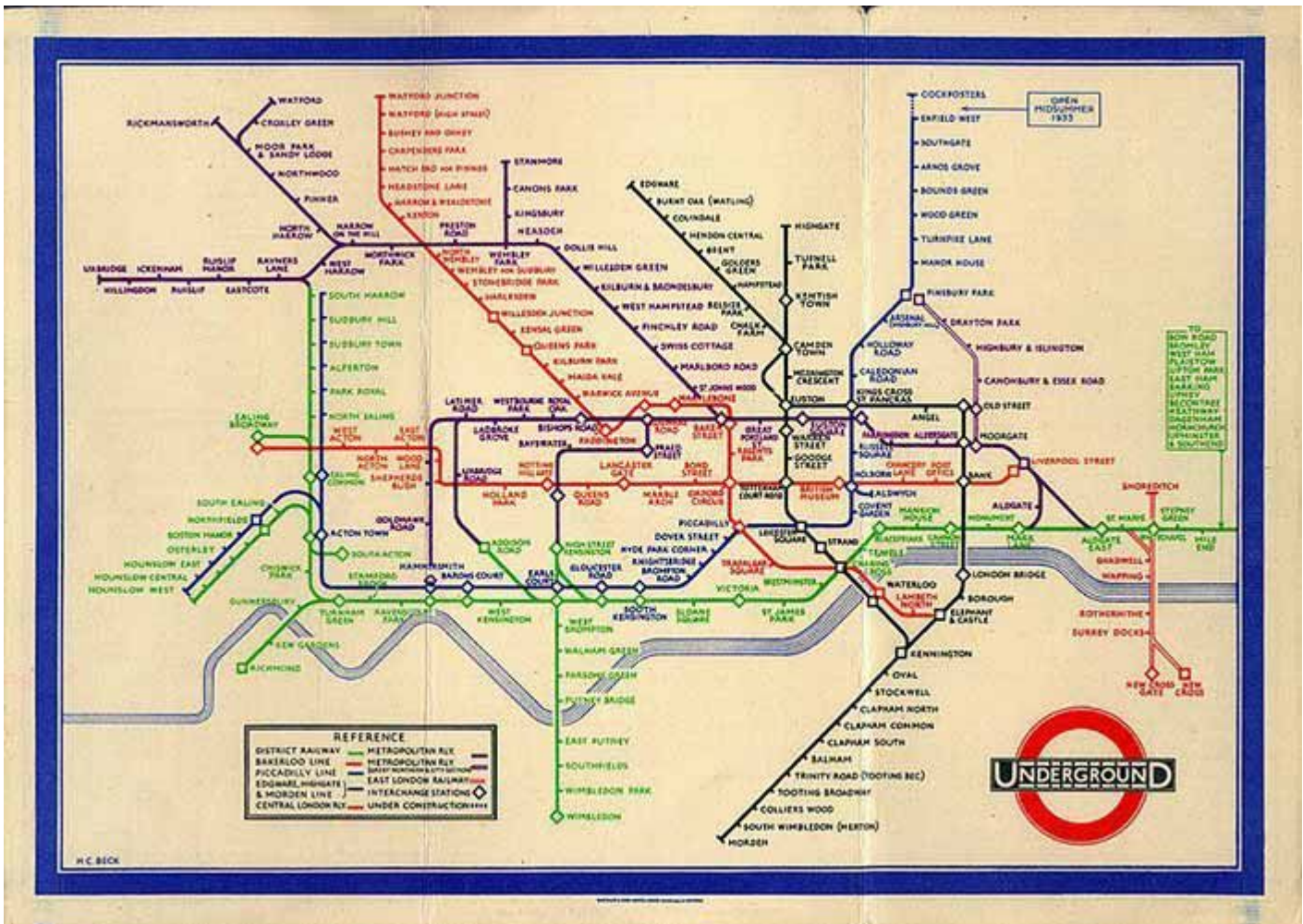


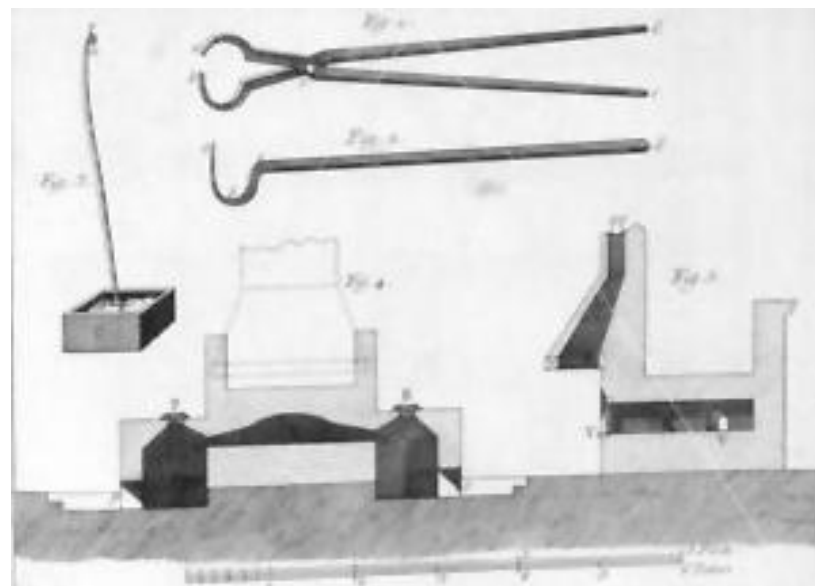
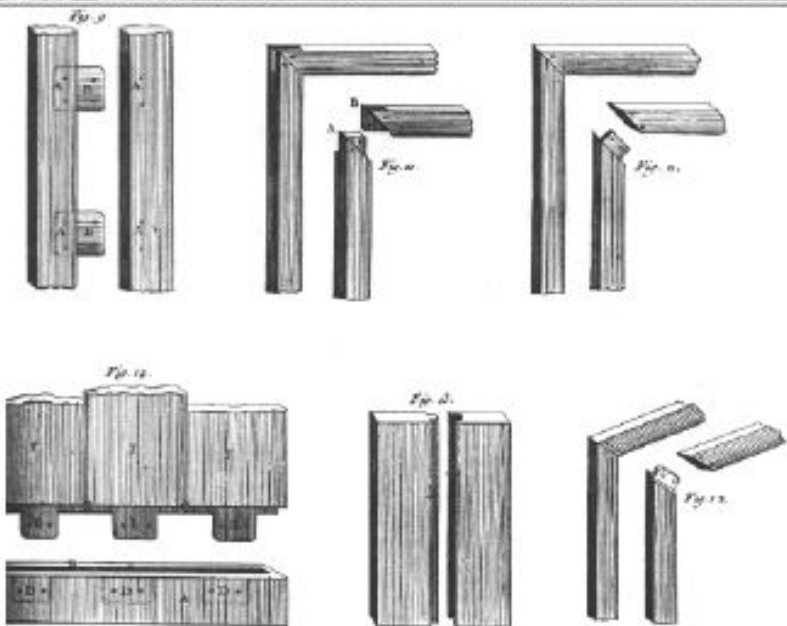
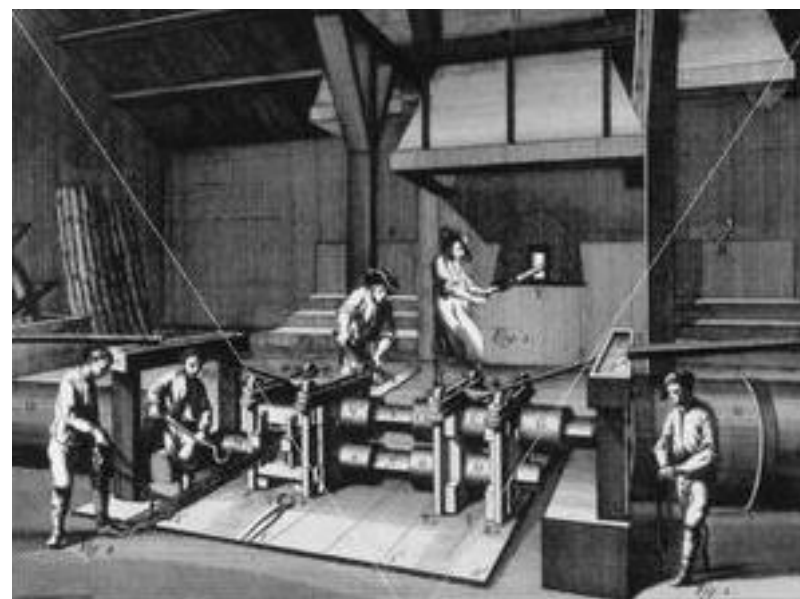
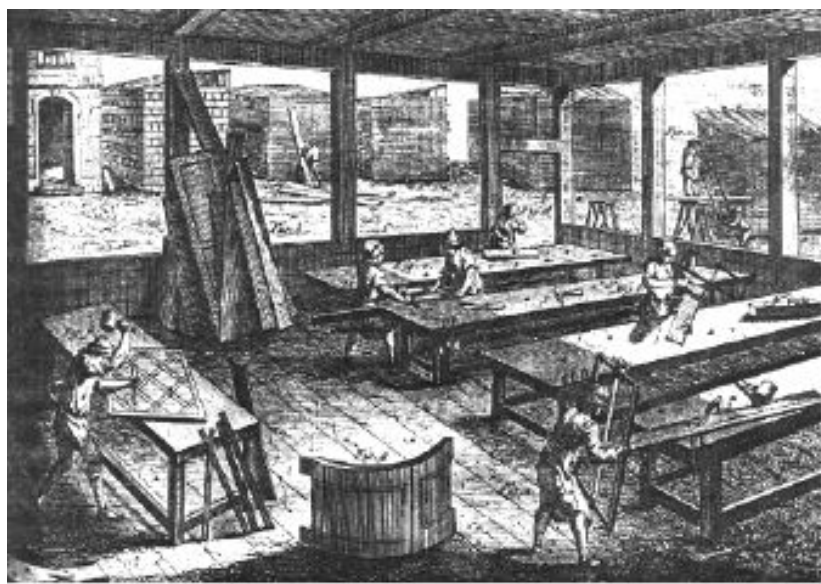
The Bottom line is divided into Years, the Right hand line into £10,000 each.
 Published as the Act above, 17th Decr 1786, by Wth Playfair
 Sold under Act, Broad-London.





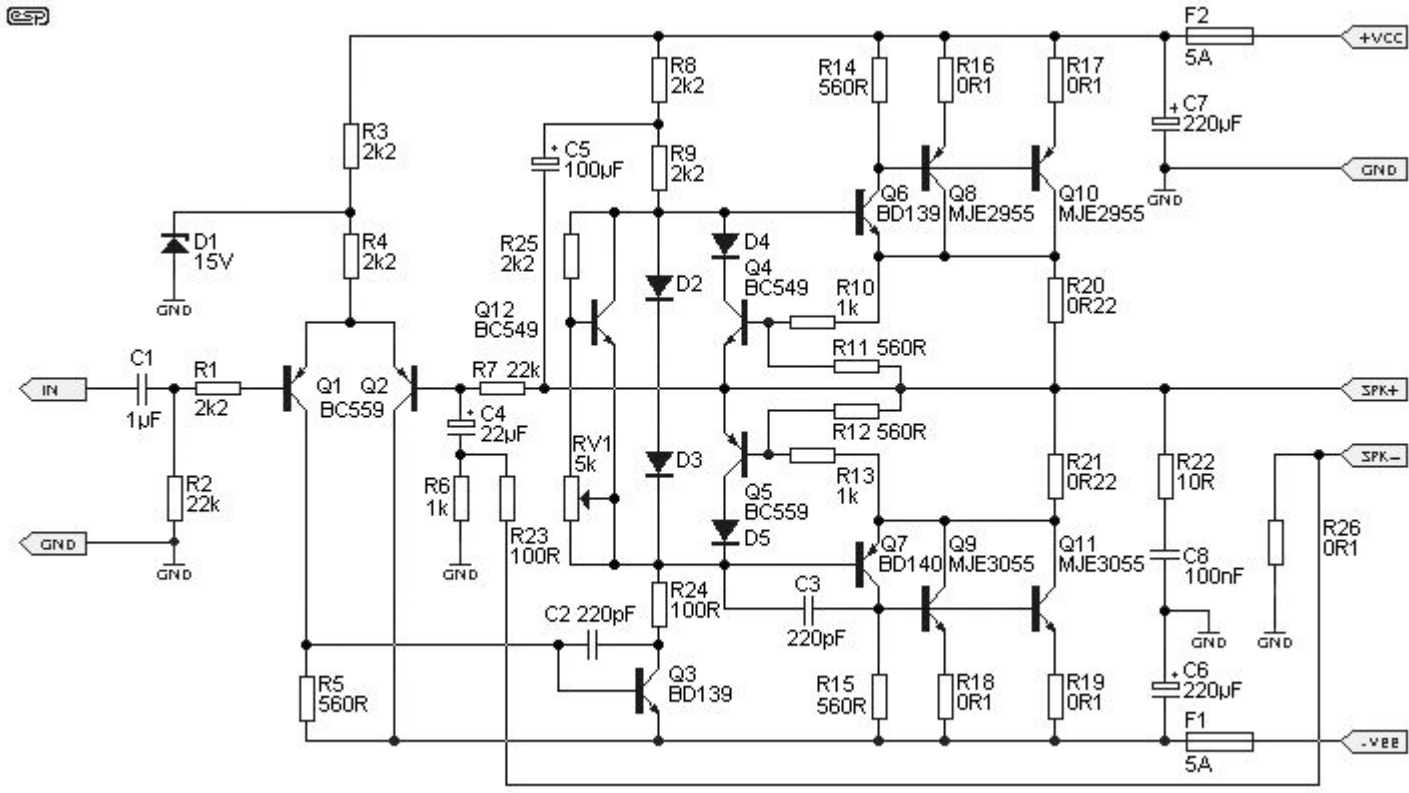
SCHEMATIC DRAWINGS

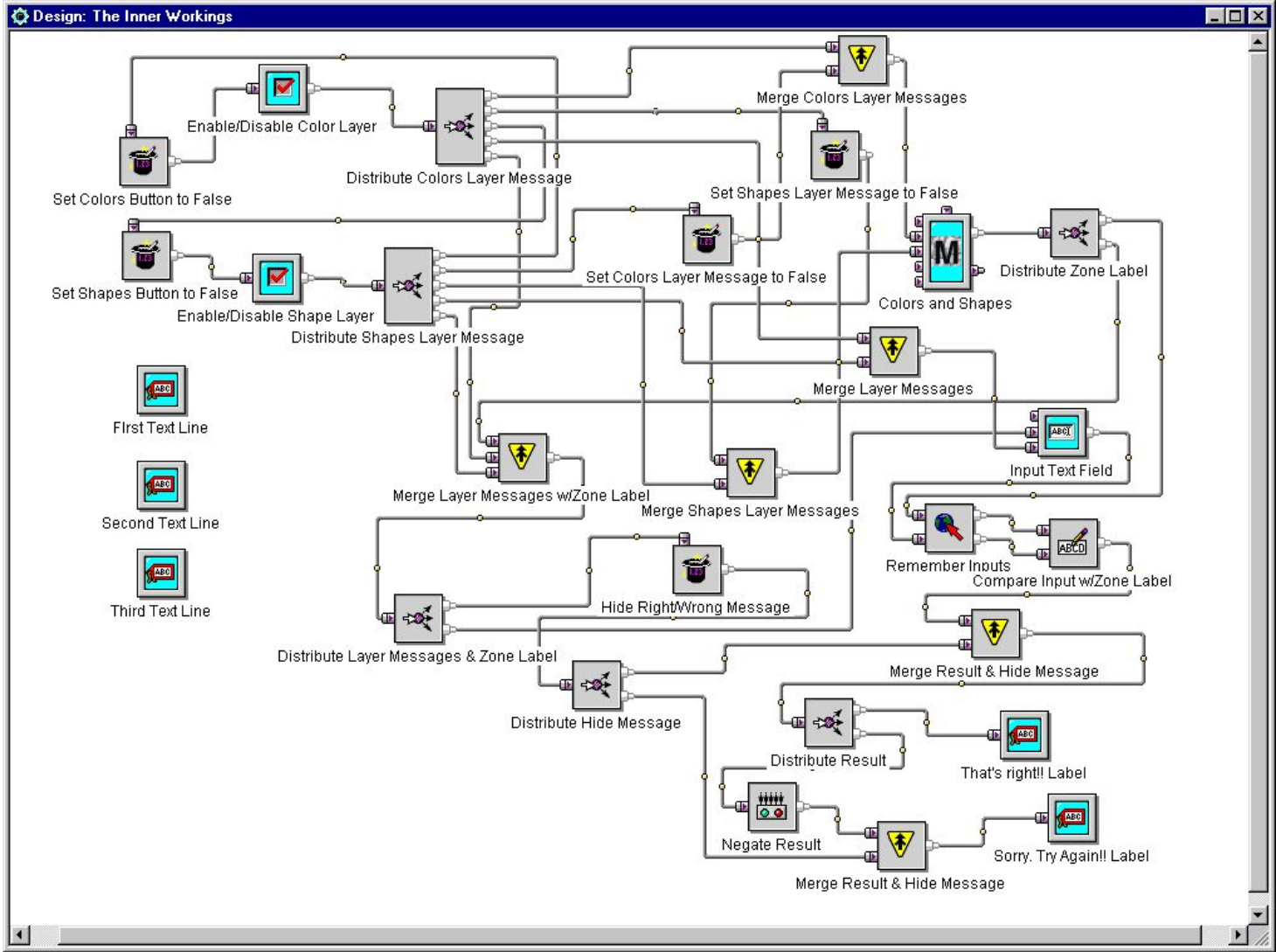




NODE-AND-LINK DIAGRAMS

ESP





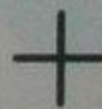
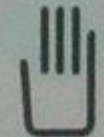
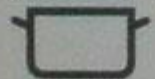
ICONS AND SYMBOLS



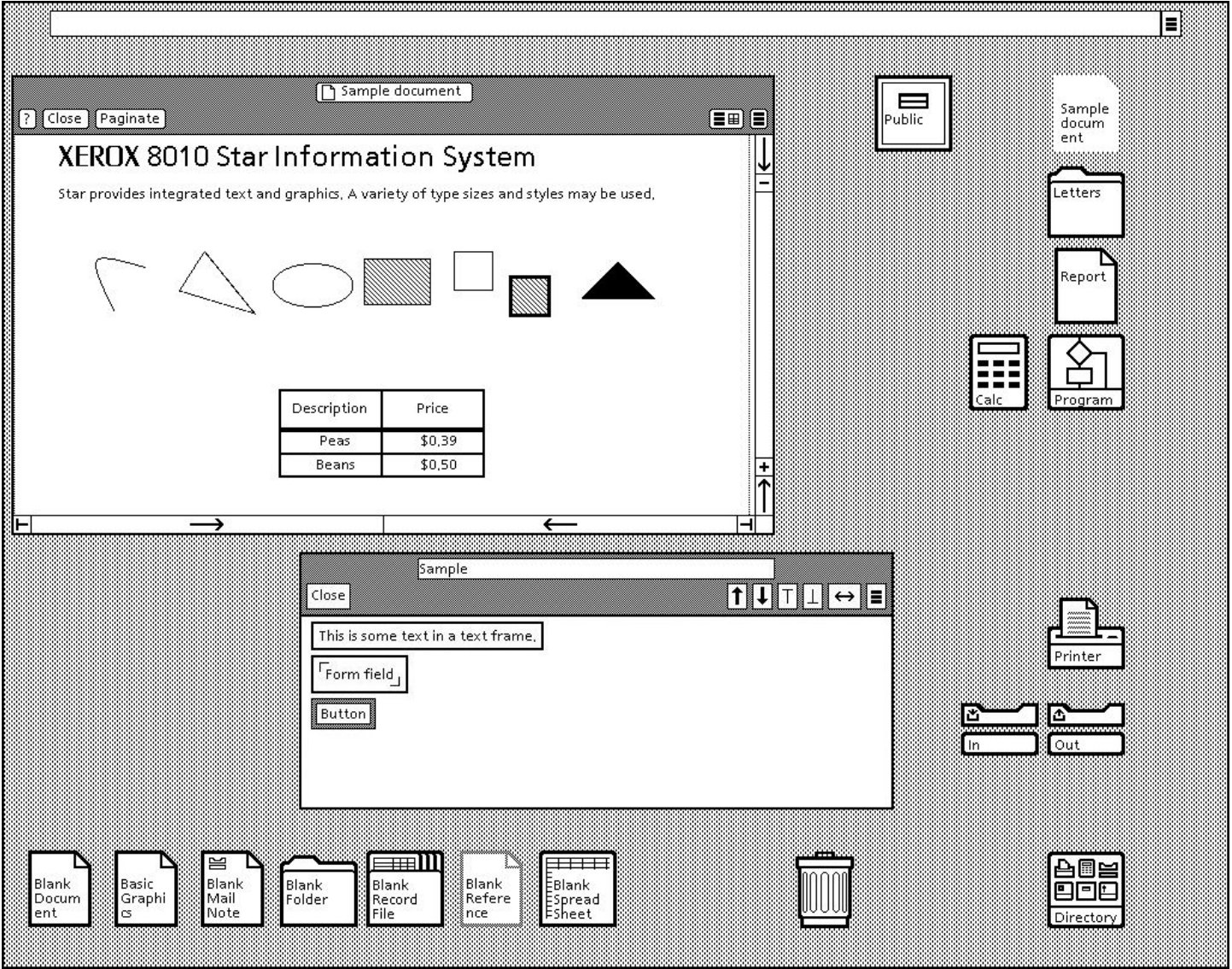
TIMER



STOP



VISUAL METAPHOR





PICTURES









WAYS OF SEEING

JOHN BERGER

Seeing comes before words. The child looks and recognizes before it can speak.

But there is also another sense in which seeing comes before words. It is seeing which establishes our place in the surrounding world; we explain that world with words, but words can never undo the fact that we are surrounded by it. The relation between what we see and what we know is never settled.

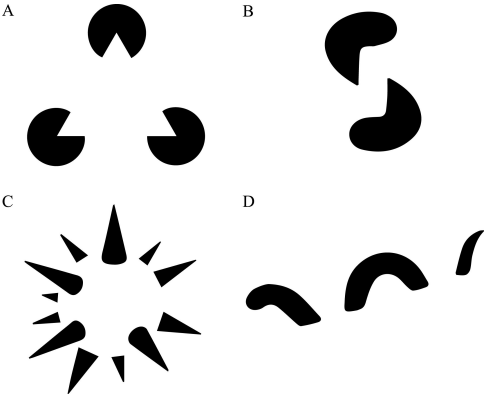


The Surrealist painter Magritte commented on this always-present gap between words and seeing in a painting called *The Key of Dreams*.

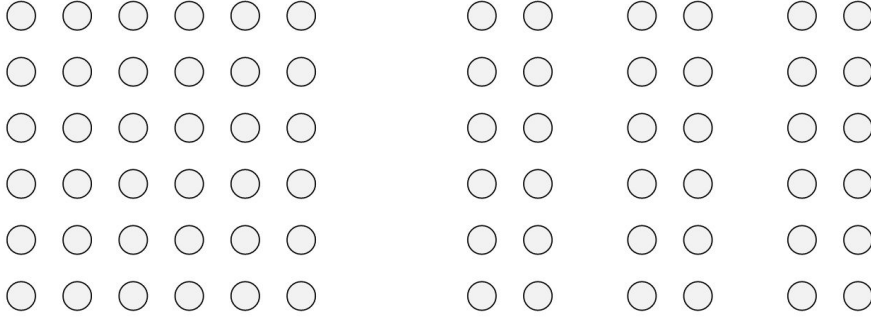
The way we see things is affected by what we

Theories of visual design

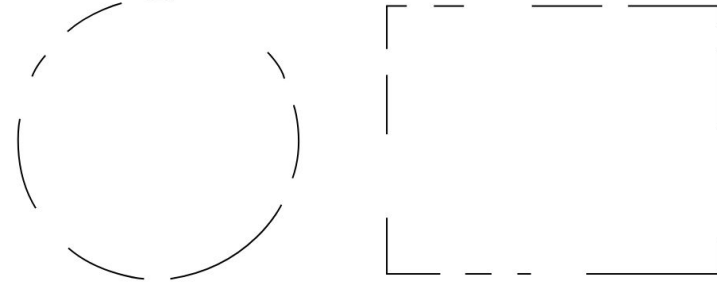
Theories of visual design



Continuity



Similarity



Closure

Whilst useful this is clearly insufficient given the range and complexity of visual interaction

	Graphic Resources	Correspondence	Design Uses
Marks	<ul style="list-style-type: none"> Shape Orientation Size Texture Saturation Colour Line 	<ul style="list-style-type: none"> Literal (visual imitation of physical features) Mapping (quantity, relative scale) Conventional (arbitrary) 	<ul style="list-style-type: none"> Mark position, identify category (shape, texture colour) Indicate direction (orientation, line) Express magnitude (saturation, size, length) Simple symbols and colour codes
Symbols	<ul style="list-style-type: none"> Geometric elements Letter forms Logos and icons Picture elements Connective elements 	<ul style="list-style-type: none"> Topological (linking) Depictive (pictorial conventions) Figurative (metonym, visual puns) Connotative (professional and cultural association) Acquired (specialist literacies) 	<ul style="list-style-type: none"> Texts and symbolic calculi Diagram elements Branding Visual rhetoric Definition of regions
Regions	<ul style="list-style-type: none"> Alignment grids Borders and frames Area fills White space Gestalt integration 	<ul style="list-style-type: none"> Containment Separation Framing (composition, photography) Layering 	<ul style="list-style-type: none"> Identifying shared membership Segregating or nesting multiple surface conventions in panels Accommodating labels, captions or legends
Surfaces	<ul style="list-style-type: none"> The plane Material object on which the marks are imposed (paper, stone) Mounting, orientation and display context Display medium 	<ul style="list-style-type: none"> Literal (map) Euclidean (scale and angle) Metrical (quantitative axes) Juxtaposed or ordered (regions, catalogues) Image-schematic Embodied/situated 	<ul style="list-style-type: none"> Typographic layouts Graphs and charts Relational diagrams Visual interfaces Secondary notations Signs and displays

Use 1: Usability analysis

- Analyse a design using this taxonomy
(e.g. Uses connotative correspondence)
- Determine if the uses are appropriate
(e.g. do people think that blue is 'off' or 'cold'?)

Cases where the visual analysis implies one connection but the operation implies another will create substantial usability problems

Use 1: Usability analysis



Use 1: Usability analysis



Mapping, Categorical: Off, cold, warm, hot

Mapping, Magnitude, Colder -> Warmer

Use 1: Usability analysis

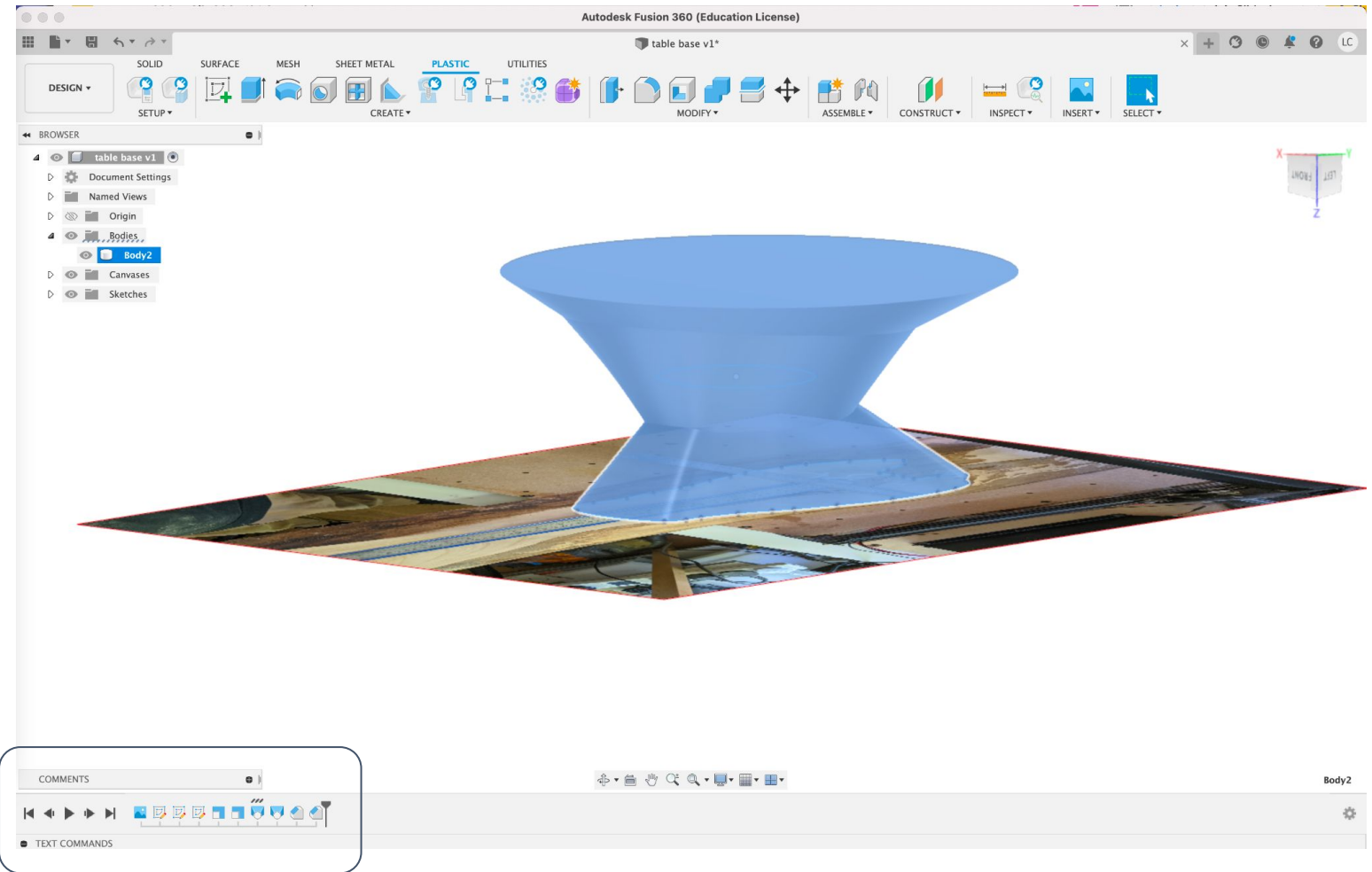


Mapping, Categorical: Off, cold, warm, hot

~~Mapping, Magnitude, Colder -> Warmer~~

Mapping, Direction(!!!), Colder -> Warmer

The programming analogy challenge 2022: Luke on Fusion 360



Action at a distance
(see Attention
Investment later in
the course)

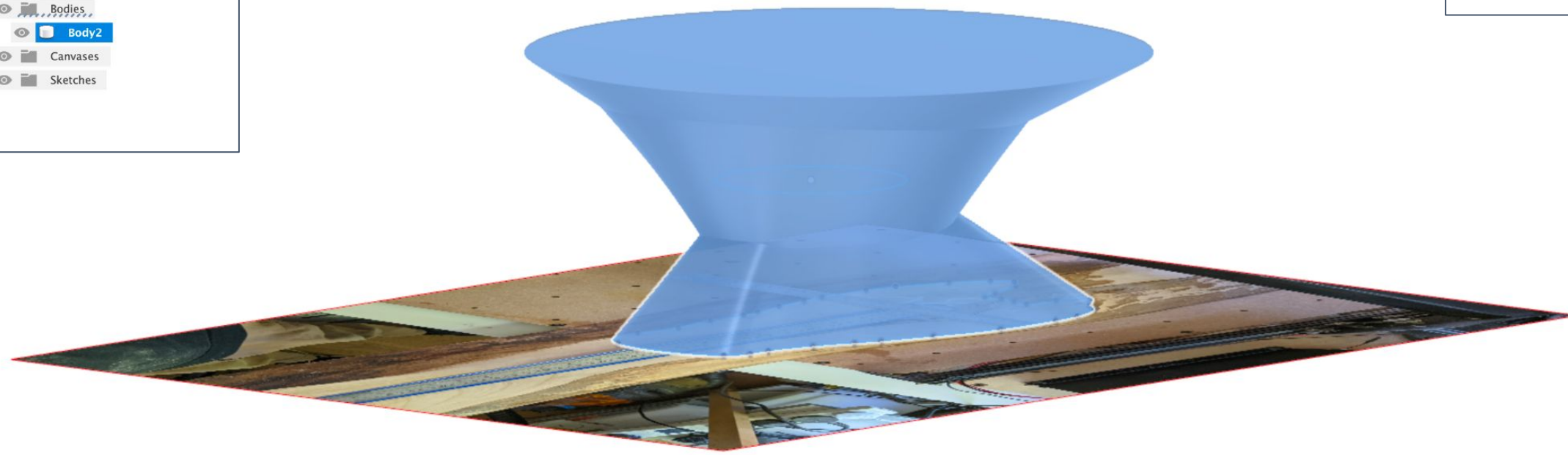
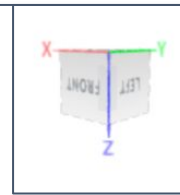
DESIGN ▾

SOLID SURFACE MESH SHEET METAL **PLASTIC** UTILITIES

SETUP ▾ CREATE ▾ MODIFY ▾ ASSEMBLE ▾ CONSTRUCT ▾ INSPECT ▾ INSERT ▾ SELECT ▾

BROWSER

- table base v1
 - Document Settings
 - Named Views
 - Origin
 - Bodies
 - Body2**
 - Canvases
 - Sketches



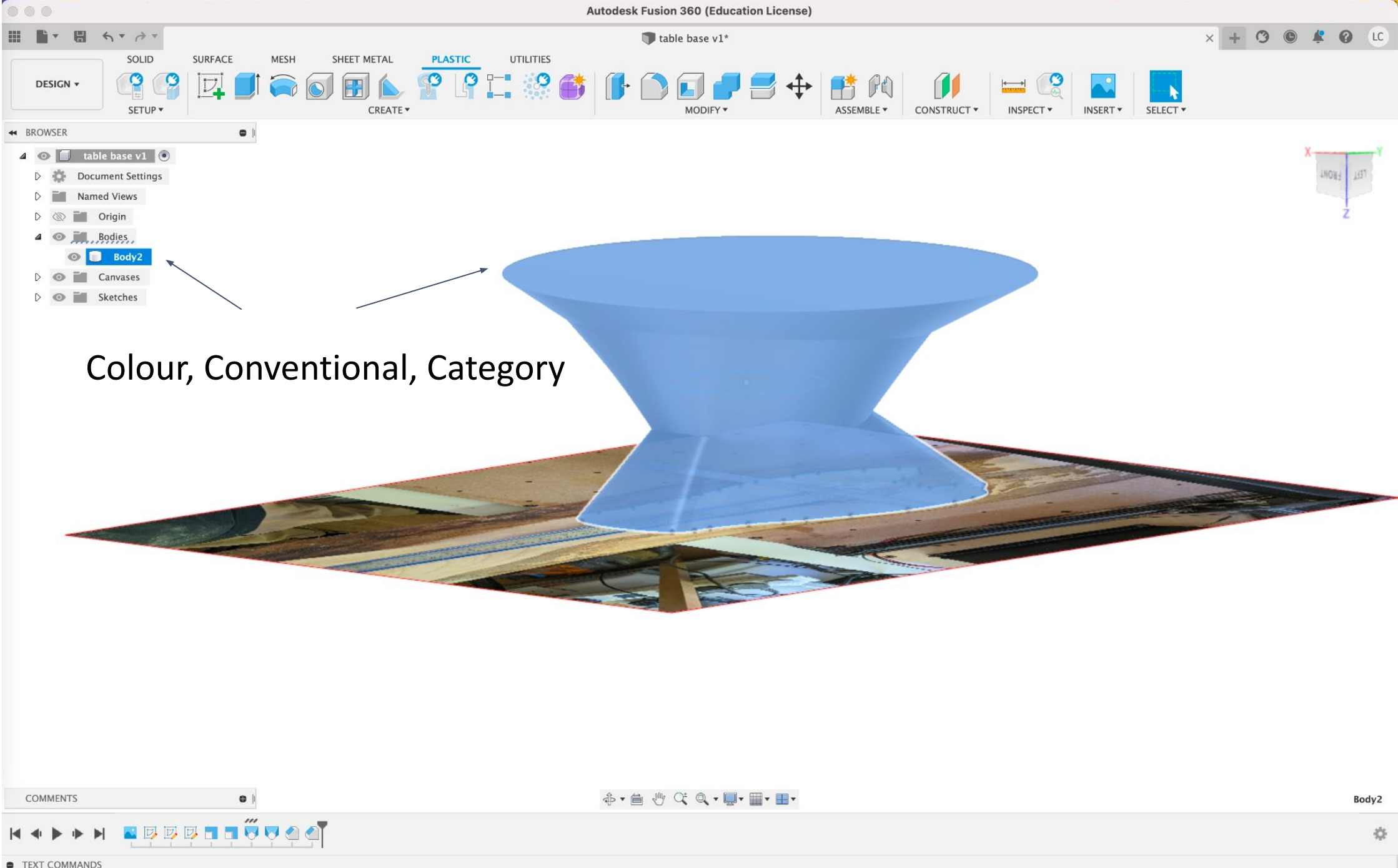
COMMENTS

Navigation icons: Home, Hand, Rotate, Zoom, Pan, Grid, Viewports

Body2

TEXT COMMANDS

Navigation icons: Back, Forward, Home, Copy, Paste, Undo, Redo, Refresh, Search, Help, Settings



Colour, Conventional, Category

The programming analogy challenge 2022: Alan on musical scores

This was an easy one (Sonic Pi was developed here) but ...

What PL features are *not* relevant to music?

What musical features suggest *alternative* PL approaches?

And how is music notation better/worse than PL notations?

Thread synchronisation

Kyrie eleison (I)

Adagio

The musical score is arranged in a system of staves. The instruments and voices are listed on the left side of the score. The vocal parts include Soprano 1, Soprano 2, Alto, Tenore, and Basso. The instrumental parts include Flauto traverso 1 and 2, Oboe d'amore 1 and 2, Fagotti, Violino 1 and 2, Viola, and Continuo. The lyrics are written below the vocal staves. The score is in 4/4 time and the key signature has two sharps (F# and C#). The tempo is Adagio. The lyrics are: Ky - ri - e, Ky - ri - e e - le - i - son, e - le - i - son. The Continuo part has figured bass notation: 7 6, 7 6, 6 9 8, 7 6 5, 6 7 6 #.

Separation of concerns

Null placeholder

BASSO

Ky - ri - e, Ky - - ri - e,

Overridden default
(within this scope)



Recent research: Designing syntax to support the musical phrase as a semantic unit



J. S. Bach Chorale number 285 of the Schubert collection,
emulating layout and spacing of the Breitkopf 1990 Edition

Original typesetting by Arild Stenberg

From Stenberg (2018) *Legibility of Musical Scores and Parallels with Language Reading*
Unpublished PhD thesis, Cambridge Centre for Music and Science

J. S. Bach Chorale number 285
Redesigned for performance by Arild Stenberg

The first system of musical notation consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. Both staves have a key signature of one sharp (F#) and a common time signature (C). The music begins with a whole note chord in both hands. The first measure of the upper staff contains a quarter rest followed by an eighth-note melody. The second measure continues the melody with eighth notes. The third measure features a half note chord with a fermata over the final note.

The second system of musical notation consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. Both staves have a key signature of one sharp (F#) and a common time signature (C). The music begins with a whole note chord in both hands. The first measure of the upper staff contains a quarter rest followed by an eighth-note melody. The second measure continues the melody with eighth notes. The third measure features a half note chord with a fermata over the final note.

The third system of musical notation consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. Both staves have a key signature of one sharp (F#) and a common time signature (C). The music begins with a whole note chord in both hands. The first measure of the upper staff contains a quarter rest followed by an eighth-note melody. The second measure continues the melody with eighth notes. The third measure features a half note chord with a fermata over the final note.

The fourth system of musical notation consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. Both staves have a key signature of one sharp (F#) and a common time signature (C). The music begins with a whole note chord in both hands. The first measure of the upper staff contains a quarter rest followed by an eighth-note melody. The second measure continues the melody with eighth notes. The third measure features a half note chord with a fermata over the final note.

The fifth system of musical notation consists of two staves. The upper staff is in treble clef and the lower staff is in bass clef. Both staves have a key signature of one sharp (F#) and a common time signature (C). The music begins with a whole note chord in both hands. The first measure of the upper staff contains a quarter rest followed by an eighth-note melody. The second measure continues the melody with eighth notes. The third measure features a half note chord with a fermata over the final note.

	Graphic Resources	Correspondence	Design Uses
Marks	Shape	Conventional (arbitrary)	Mark position identify category (shape)
Symbols	Geometric elements Letter forms Connective elements	Topological (linking) Acquired (specialist literacies)	Texts Definition of regions
Regions	Alignment grids White space	Containment Separation	Segregating and nesting multiple surface conventions in panels Accommodating labels
Surfaces	Material object on which the marks are imposed (paper)	Metrical (quantitative axes) Juxtaposed and ordered (regions)	Musical score

