



A Short History of CAD, Computer Aided Design

Chris Scarlett

Owner - Designer

Enterprise Design and Innovations



Introduction: Chris Scarlett

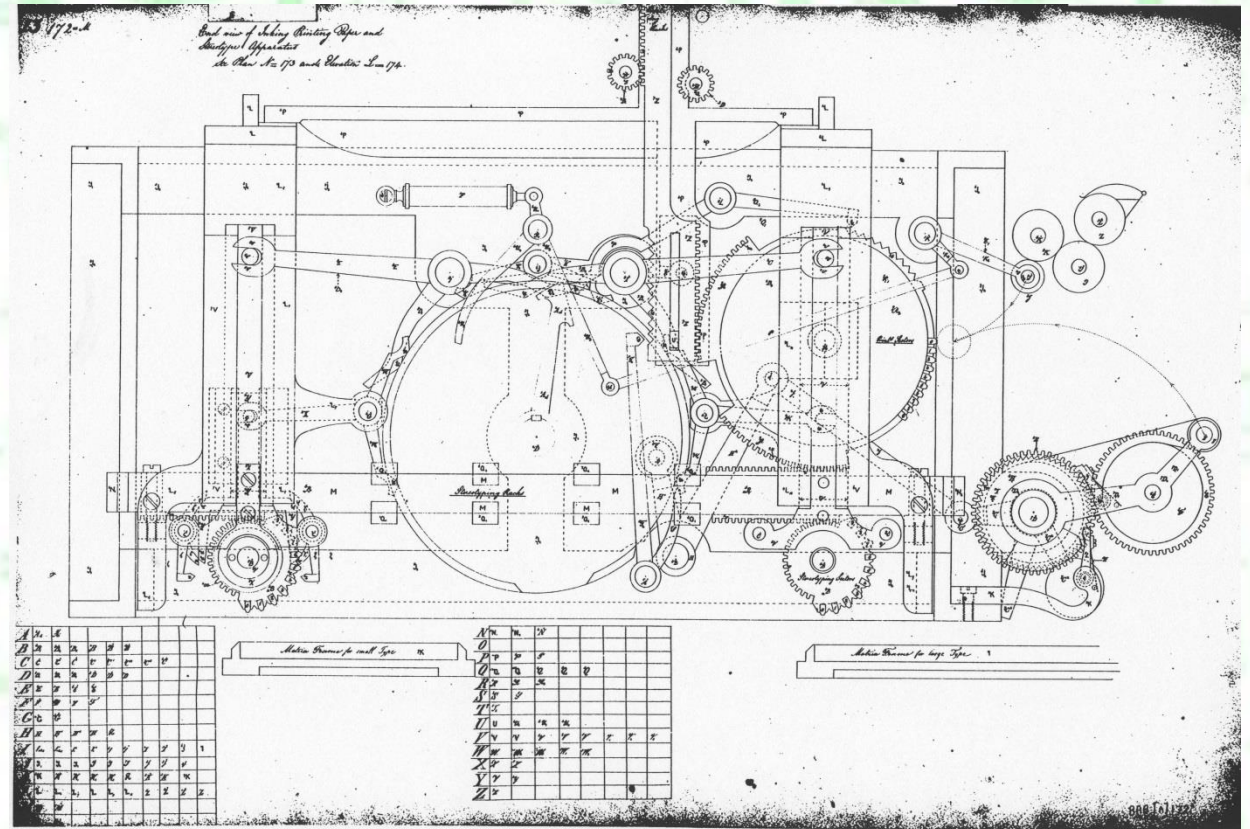
Educator - Designer - Product Developer

- Educator
 - SOLIDWORKS, AutoCAD and Revit Architecture at CWU, YVCC, SolidWorks World
 - Content provider for Pluralsight, Digital Tutors
- Design, consulting and training services through Enterprise Design and Innovations
- Experience: mechanical & architectural design, product development, patent drawings, proof of concept – prototype creation, image and video production.
- Catnip – Kitty Catnip, our specialty is the bud, one of the highest rated products on Amazon.



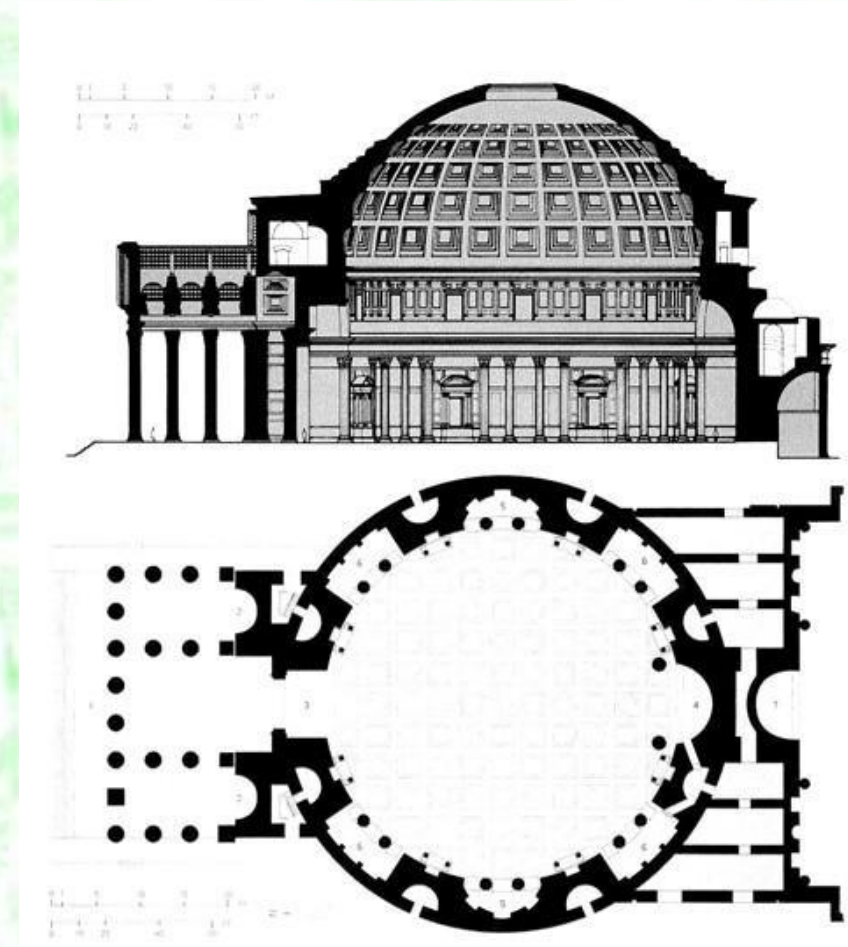
Drawings: What is a drawing?

- So that information can be directed from a designer, mechanical designer, architectural designer to the builders.
- Drawings were created with measurements and constraints and scaled so that objects can be created to the designers specifications. Without a lot of direct intervention.



Drawings: What is a drawing?

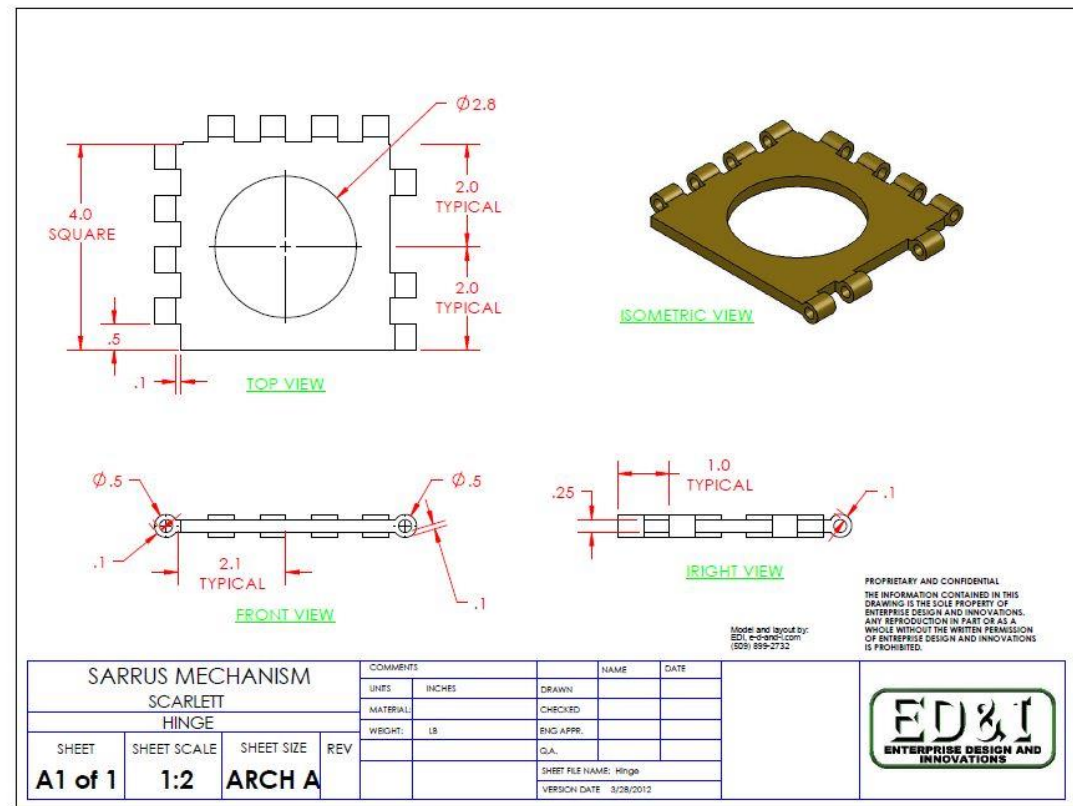
- Roman ruins show some building plans etched on nearby walls.
- Designers had to be close to their work, just like today. More direct communication back then.
- Then came scrolls and paper, the designer's life started to become a lot easier.



Drawings: A product that conveys information about how to build something

In this age it could be defined as:

- Paper drawings with constraints and dimensions
- Solid Model with constraints and dimensions to be exported with data for visualization a CNC machine or 3D printer or similar.



Design and Drafting – a Short History

1500s

- Drafting machines,
 - Easy drawing of parallel and perpendicular lines
 - With scaled rulers
 - Popular until the advent of CAD, phased out in the late 70s to late 90s.

[Drafting Machines Images.](#)

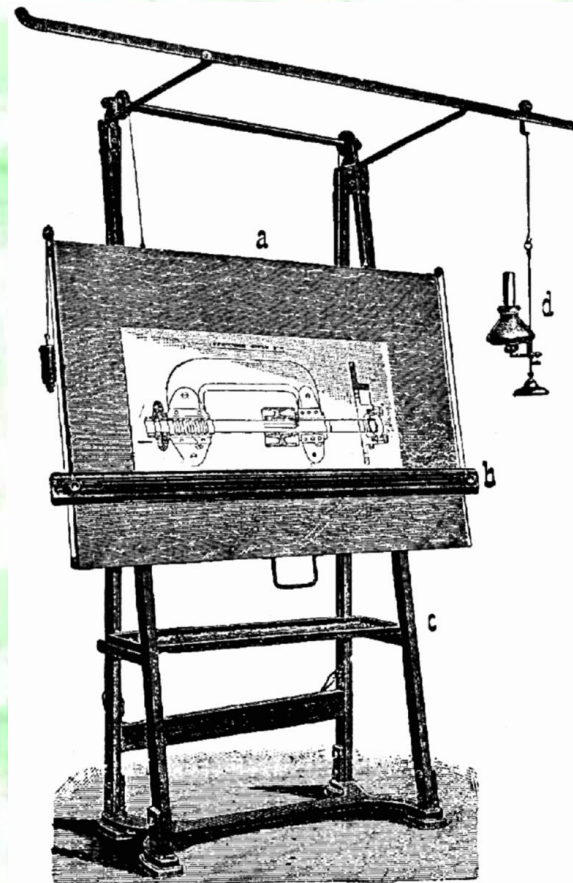
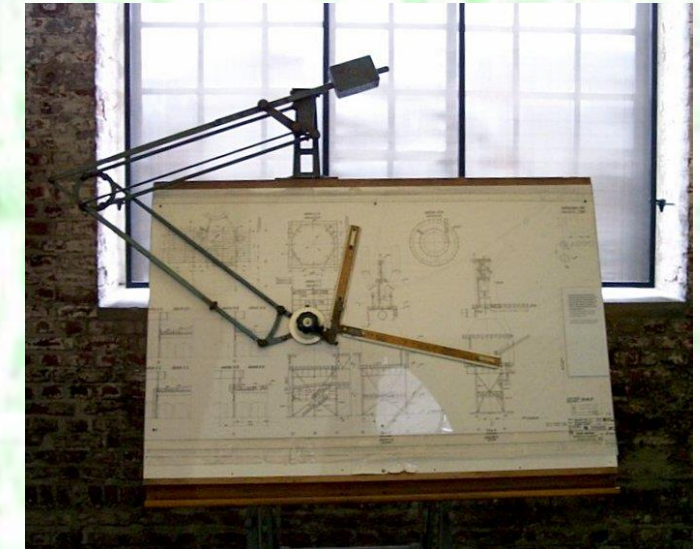


Fig. 2. Mechanische Zeichentafel. *a* Reißbrett. *b* Reißschiene. *c* Gestell. *d* Bewegliche Lampe.



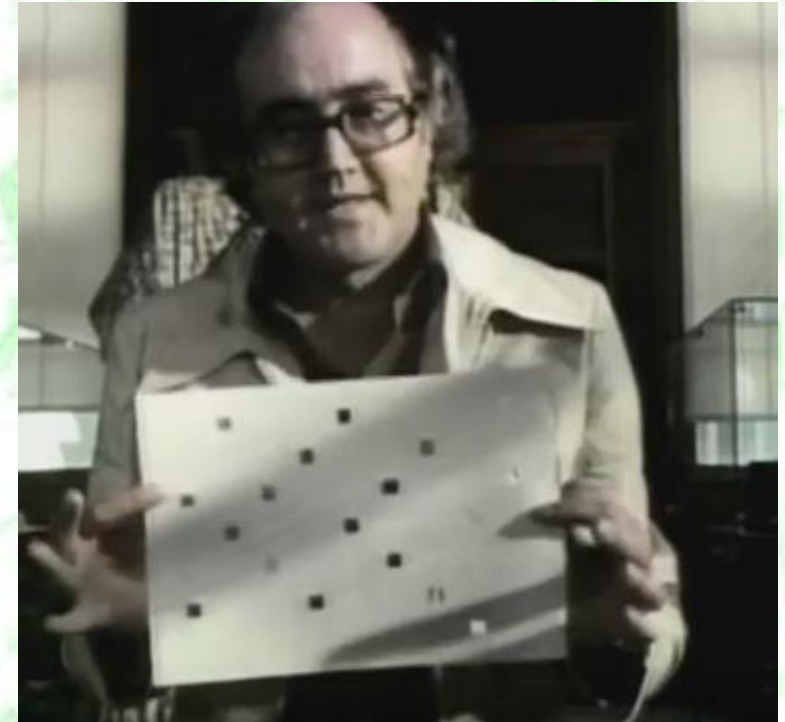
Design and Drafting – a Short History

1940s and 50s

- Development of computer generated numerical controls for machine tools at MIT
 - Precursor to CNC machines run by computer controllers.
 - It defines how a tool moves
 - Similar process to how a 3D printer works.
 - Before – 1700s - mechanical controls

[YouTube - James Burke on Automated Looms](#)

[Wiki on Numerical Control](#)



Computer Aided Design – a Short History

1957

- Patrick Hanratty
 - The father of CADD/CAM (Computer Aided Design and Drafting – Computer Aided Manufacturing)
 - At GE
 - Developed PRONTO (Program for Numerical Tooling Operations)
 - The first commercial CNC programming system. G-Code programmers



Computer Aided Design – a Short History

1963

- [Sketchpad](#), First CAD software/hardware machine
- Ivan Sutherland - PhD thesis at MIT,
 - Visual - First with a GUI, light pen on CRT monitor,
 - Lines between points
 - Machine - size of a small house.
 - Early adapters, auto and aircraft manufacturers.



[YouTube Sutherland-Demo-1](#)

[YouTube Sutherland-Demo-2](#)

[YouTube Sutherland Demo-3, The Arts Mechanical](#)

Computer Aided Design – a Short History

1965

- Digigraphics division of Control Data Corporation
 - First commercially available CAD system
 - Hardware/software came together.
 - Late 60s crowded field in industry, others include IBM 2250, Information Displays, Adage AGT-30, Computervision



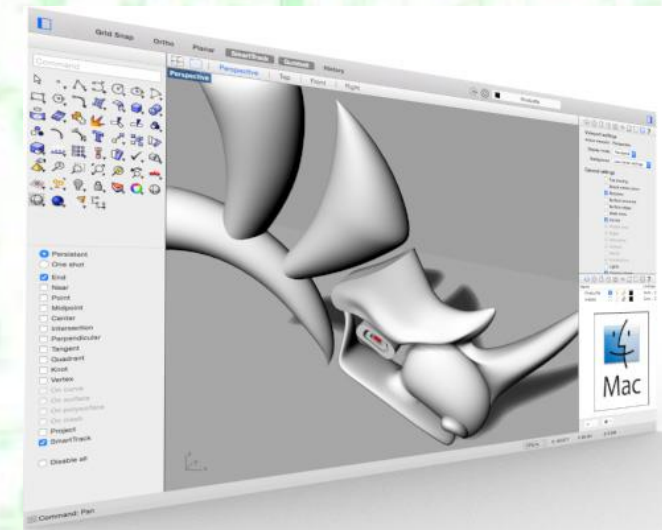
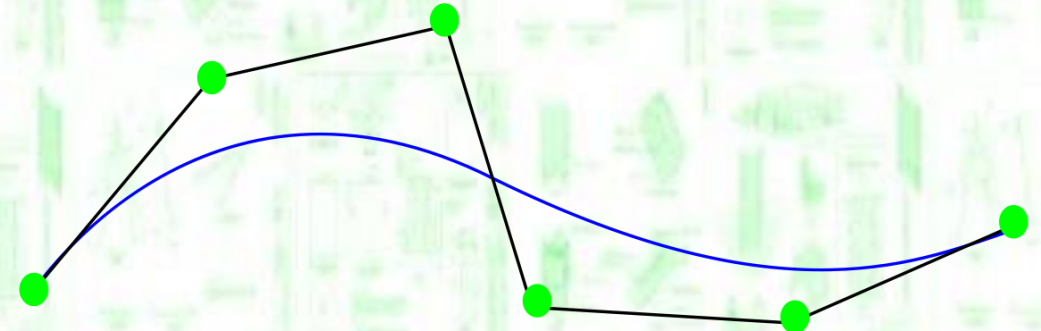
[What When How](#)

[Adage AGT-30](#)

Computer Aided Design – a Short History

1970s

- Software development - 2D lines and surfaces to 3D solid models
- Ken Versprille, invention of NURBS (non-uniform rational basis spline) for his Ph.D. thesis
 - [Rhinoceros - Robert McNeel - Seattle](#),
- First 3D solid modeling Software
- SynthaVision for nuclear exposure modeling



[Wiki on NURBS](#) [CADAZZ](#)

Computer Aided Design – a Short History

1978

- Software development.
- Herb Voelcker's solid modeling release of the PADL (Part and Assembly Description Language) solid modeler
 - Now a difference between substance and void.
- Others included BUILD
- Consulting firm Shape Data Ltd
- Still making machines to run the software or custom applications.

[CADAZZ Advanced Manufacturing on Herb Voelcker](#)



In the early 1980s, professor Herbert Voelcker learned CNC technologies as his research team launched multiple projects in automation engineering, including developing the Machining Process/ Programming Language (MPL) aimed at setting up machine tools.

Computer Aided Design – a Short History

1970s

- Commercial products –
- Custom programs and machines were made for large companies
- computers were getting smaller, faster and more powerful.
- Software companies using current technology:
- Auto-Draft, Calma, Computervision CADDs, IBM's CADAM, M&S Computing's IGDS, Unigraphics
- Result - smaller companies and better computers many sold to large firms McDonnell Douglas and GE.

[CADAZZ Wiki on Calma](#)



Computer Aided Design – a Short History

1980 – 1985

- DEC new mini computer - MicroVAX dominated
- Large appliance,
- Fewer custom applications, off the shelf hardware and software packages
- Familiar names HP with its PE CAD, GE and CALMA, Dassault Systemes with CATIA and IBM
- Unix Workstations come in
- AutoCAD first \$1000 program for the new PC.
- DEC merge with Compaq merge with HP
- 1985 Romulus-D 3D CAD software, best yet.

[Wiki on VAX](#) [HP Journal on HP PE](#) [History of CAD](#)
[Medium on Evolution of CAD](#)

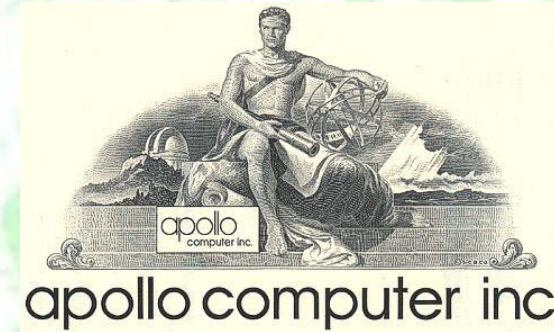


Computer Aided Design – a Short History

1986 – 1989

- Hardware, Apollo Computer, Sun Microsystems, SGI, HP, DEC and IBM all competed for the new workstation market
- 1987 Apollo Computer achieved the #3
 - 1989 HP acquired it
- End of the 1980s, DEC was on the ropes
- IBM, with open source PCs, was losing ground.

[Medium](#)



Computer Aided Design – a Short History

1990s

- Great competition amongst large companies
- Boeing and Catia
- Unigraphics with Pratt & Whitney and GE engines
- Catia with Mercedes-Benz, Chrysler, Renault and Honda
- Caterpillar - Pro/Engineer (now Creo).
- Hardware now workstations - no large computers
- PCs growing with Windows NT 32 bit Pentium
- AutoDesk with AutoCAD the leader by far
- 1993 comes SolidWorks

[Medium](#) [CADAZZ](#)

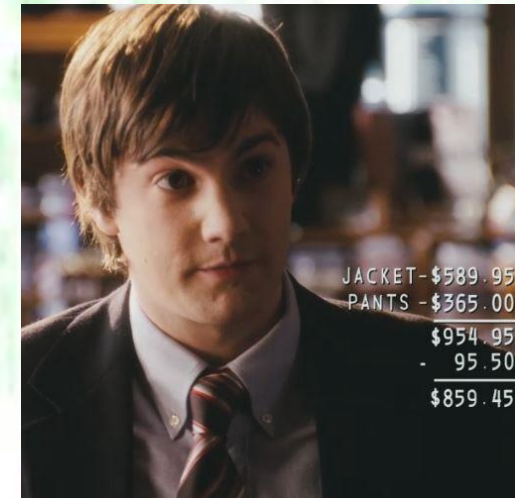
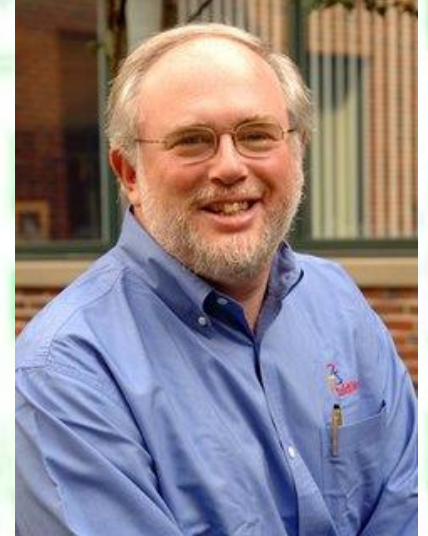


Computer Aided Design – a Short History

1993

- [Jon Hirschtick](#),
 - Director of engineering at [Computervision](#)
 - MIT graduate
 - Player and instructor on the [MIT Blackjack Team](#), [Movie 21](#),
 - Founder of SolidWorks, 1993 with \$1,000,000 from blackjack.
 - Sold SolidWorks to [Dassault Systemes](#) for 310,000,000 in stock, 1997.
 - Left SolidWorks in 2012 to found [Onshape](#).

[Wiki on Jon Hirschtick](#)



Computer Aided Design – a Short History

- SolidWorks, probably the best-selling brand of 3D CAD software in the world - 8x AutoDESK Inventor, half of AutoCAD though, waning
- Autodesk Revenue - 2016 - 2.5 billion
- Dassault Systèmes - 2016 - Revenue 3.4 billion
- SolidWorks - Get involved in the community



[SolidWorks Users Group Network \(SWUGN\)](#)

[Seattle Area SolidWorks Power Users Group \(SASPUG\)](#)

[Yakima SolidWorks Users Group \(YSWUG\)](#)

[SolidWorks World](#)

[SolidWorks Forum](#)

[Product Launch Events](#)



Computer Aided Design – a Short History

Your class website at edandi.com/Instruction

Thank You!