

Unit 1: AutoDesk Software Refresher

Content Area: **Industrial Technology**
Course(s): **Auto CAD II**
Time Period: **1 marking period**
Length: **10 Weeks**
Status: **Published**

Unit Overview

In this unit, Students will be refreshing understanding of AutoCAD and Inventor Processes and Procedures. Students will be focusing on excises that explore and highlight different tools in order to jog the memories of the students, especially those who have not had an AutoDesk Software focused course in many years. Students will have a series of demonstrations and challenges in this unit, in order to prepare themselves for a more designed focused class.

Transfer

Students will be able to independently use their learning to...

- Draw upon previously learned knowledge years after it being implemented
- Utilize processes from engineering and architectural professionals in order to construct objects and solve problems
- Read and understand provided specifications for parts, tools, and objects
- Accurately generate objects when prompted, either verbally, or with provided specifications
- Follow a scheduled time frame and deadlines for project development

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Understandings

Students will understand...

- The individual processes, tools, and procedures for AutoCAD and Inventor software
- Draw upon knowledge and utilize tools in order to generate requested parts, objects and designs from clients
- Properly format and annotate drawings displays in order to convey parts properly to the clients
- How to describe their approach start to finish for generating an object
- Design a roadmap for the process of building different objects and for working on longer scale projects

Essential Questions

Students will keep considering

- What tools should be used for any given task?
- What would I use this program for in the real world?
- Is there anything I can do with this program beyond a classroom setting?
- Do I foresee myself finding a career or job involving this program?
- What applications could I use 3D modeling for?
- How accurate do I have to be when modeling in a 3D space
- How do I go about changing or adjusting an object I render?
- Are there jobs in companies that utilize this kind of design and software?
- If I wanted a career in this, what routes can I take?
- What does the design process look like when compared to 2D modeling and design?

Application of Knowledge and Skill

Students will know...

Students will know...

- How to render a 3D model using inventor software
- How to translate a 2D laid out model in order a 3D model using inventor
- How to import AutoCAD drawings into inventor to generate 3D models

- The tools that can be utilized in Inventor in order to modify and adjust a model properly
- How to annotate, label, and transfer models into a printable medium
- How to animate 3D models to create demonstrations of behavior for a particular invention
- How to create a variety of basic shapes and objects using AutoCAD
- Dimensioning principles and conventions
- Present and submit drawing documentation in the proper formats
- Both replication and design of objects given different levels of prompt difficulty

Students will be skilled at...

Students will be skilled at

- Completing drawing and drafting tasks quickly and efficiently
- Being able to design anything objects when prompted
- Applying drawing principles to greater design work, such as full on architecture or engineering designs
- Replication of drawings based on reading dimensions and analysis of structure of presented objects.
- Creating new concepts, inventions and objects using Inventor software
- Generating accurate models in 3D using 2D drawings
- Following vague instructions for construction of a consistent model
- Design accurate pieces based on researched images
- Animation processes for 3D models

Academic Vocabulary

Sketches

AutoCAD

Inventor

Line

Angle

Circle

Mirror

Array

Filet

Chamfer

Isometric

Orthographic

Extrude

Revolve

Learning Goal 1 - AutoCAD Refresher

SWBAT Generate sketches, and design plans utilizing tools and processes in AutoDesk AutoCAD Software

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.F.CS2	Plan and manage activities to develop a solution or complete a project.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.A.CS2	The core concepts of technology.
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.C.CS1	The attributes of design.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Target 1 - Line, Angle, Circle, Mirror, Array

SWBAT Utilize the tools of AutoCAD to make Lines, Angles, Circles, and to mirror objects, and well as generate array patterns

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Target 2 - Filet, Chamfer and Isometric Drawing Processes

SWBAT Utilize the tools of AutoCAD in order to perform Filets and Chamfers

SWBAT Create 3D objects in a 2D space using Isometric Drawing Processes in AutoCAD

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Learning Goal 2 - Inventor Refresher

SWBAT Generate objects, inventions, and figures utilizing tools and processes in AutoDesk Inventor Software

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.F.CS2	Plan and manage activities to develop a solution or complete a project.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.A.CS2	The core concepts of technology.
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.C.CS1	The attributes of design.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Target 1 - Individual Object Generation, Tools, and Processes

SWBAT Create objects by following specifications from the client in Inventor

SWBAT Sketch, extrude, revolve, filet, and chamfer generated objects in order to meet proper specifications for objects

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
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TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Target 2 - Assembly Processes and Operations

SWBAT Assemble generated parts in order to create new objects and figures

SWBAT Annotate generated assemblies using Inventor Annotation and Labeling tools

TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.D.CS3	Assess the impact of products and systems.

Summative Assessment

- Performance Tasks
- Test/Quiz
- Benchmark Exam Drawing
- Challenge Drawing of Marking Period

21st Century Life and Careers

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
CAEP.9.2.12.C.9	Analyze the correlation between personal and financial behavior and employability.

Formative Assessment and Performance Opportunities

- Academic Games
- Classroom Discussions
- Classwork
- Closures
- Do Nows / Warm Ups
- Group Work
- Homework
- Student / Teacher Discussions
- Think-Pair-Share
- After School and Lunch Opportunities

Accommodations/Modifications

- For each Refresher Drawing, Alternative Color Scheme for Notations for students who need color adjustments provided
- For each Refresher Drawing Written Tutorial, Specific instructions for drawings provided in alternative language options for students
- If Vision issues with computer screens, can adjust size of text font and icons to fit the needs of the students
- If ESL, Language adjustments can be implimented into AutoCAD
- If ESL, Alternative Notes can be provided.
- Video tutorials contained within refresher skills videos provided contain alternative language and english subtitles
- Preferential Seating will be provided for the sake of demonstrations, note taking, and general physical and behavioral accommodations
- 504 Accomodations
- Additional Challenging / Enrichment Tasks
- Grouping
- IEPs
- Drawing of the Month
- Scaffolding Questions
- General Use of Technology Accommondations (Adjusted to meet needs of student in accordance to 504/IEP)
- Project Time Frame Negotiations and Performance Evaluation for Unfinished Work

Unit Resources

- AutoDesk Design Handbook
- General AutoCAD Practice Websites - <https://www.investintech.com/resources/blog/archives/5947-free-online-autocad-tutorials-courses.html>
- Khan Academy
- Youtube Tutorials - https://www.youtube.com/channel/UC0bEfqT1FZudcnyegNvtu1A?view_as=subscriber

Interdisciplinary Connections

LA.RH.9-10.3	Analyze in detail a series of events described in a text; draw connections between the events, to determine whether earlier events caused later ones or simply preceded them.
LA.RH.9-10.7	Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text, to analyze information presented via different mediums.
LA.WHST.9-10.6	Use technology, including the Internet, to produce, share, and update writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
9-12.HS-ETS1-1.1	Asking Questions and Defining Problems
9-12.HS-ETS1-4.5	Using Mathematics and Computational Thinking
9-12.HS-ETS1-4.ETS1.B.1	Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical; and in making a persuasive presentation to a client about how a given design will meet his or her needs.