Audubon Public Schools

Architecture

Curriculum Guide

Developed by:

Mr. Dustin Stiles

Mr. Michael Stubbs

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Course Description

Architecture

This course focuses on commercial and residential design. Floor planning, architectural style, interior design, energy, site planning, and construction concepts are applied to computer drawings thru AutoCAD and Revit.. The course is a great course for future home and business owners or anyone interested in exploring architecture, construction or other fields of engineering.

Overview / Progressions

Overview	Focus Indicator #
Unit 1: Parts of Residential/Commercial Building	• 8.2.12.ED.5 • 8.2.12.ED.6 • 8.2.12.NT.1 • 9.3.12.AC.1 • 9.3.12.AC.4 • 9.3.12.AC.5 • 9.3.12.AC.7
Unit 2: Reading Plans and Using AutoCAD in Architecture	• 8.2.12.ED.2 • 9.3.12.AC.1 • 9.3.12.AC.6
Unit 3: Using Revit in Architecture	• 8.2.12.ED.2 • 9.3.12.AC.1 • 9.3.12.AC.2
Unit 4: Designing Your Own Structure	• 8.2.12.ED.1 • 8.2.12.ED.2 • 8.2.12.ED.3 • 8.2.12.ED.4 • 8.2.12.ED.5 • 8.2.12.ITH.2 • 9.3.12.AC.1 • 9.3.12.AC.2 • 9.3.12.AC.5 • 9.3.12.AC.6 • 9.3.12.AC.7

	• 9.3.12.AC-DES.4

Architecture	Grades 10-12	Unit 1: Parts of Residential/Commercial Building	Nine Weeks

Performance Expectations		Critical Knowledge and Skills
8.2.12.ED.5	Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).	Students will know a building systems parts and how they work
8.2.12.ED.6	Analyze the effects of changing resources when designing a specific product or system (e.g., materials, energy, tools, capital, labor).	Students will understand the materials used in architecture and why they are used
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.	Students will understand how the parts of a building work together
9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.	Students will know common architecture vocabulary
9.3.12.AC.4	Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.	Students will know the process of building from design to erection
9.3.12.AC.5	Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.	Students will understand the process and role of each division in building a structure
9.3.12.AC.7	Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.	Students will know all the jobs available in building a structure

Formative Assessments	Summative Assessments
● Class Participation ● Parts of a Building Quizzes	● Systems of a Building ● Observation of Working
Suggested Primary Resources	**Suggested Supplemental Resources**
● Architecture Books ● Internet	● Powerpoints ● Teacher generated handouts
Cross-Curricular Connections	
● Language arts- writing, oral communication ● Math-measurements, angles, weights ● History- history of architecture ● Science- environmental factors ● Art- sketching and drawing	
Enduring Understanding	**Essential Questions**
● General knowledge of the building process of a structure. ● General knowledge of the parts of a structure.	● How do I build a house/commercial building? ● What is a foundation? ● What is framing? ● What building materials can I use? ● What is the process of construction?

Differentiation		
504	● preferential seating ● extended time on tests and assignments ● reduced homework or classwork ● verbal, visual, or technology aids	● modified textbooks or audio-video materials ● behavior management support ● adjusted class schedules or grading ● verbal testing

Enrichment	● Utilize collaborative media tools ● Provide differentiated feedback ● Opportunities for reflection ●	● Encourage student voice and input ● Model close reading ● Distinguish long term and short term goals
IEP	● Utilize “skeleton notes” where some required information is already filled in for the student ● Provide access to a variety of tools for responses ● Provide opportunities to build familiarity and to practice with multiple media tools ● Graphic organizers	● Leveled text and activities that adapt as students build skills ● Provide multiple means of action and expression ● Consider learning styles and interests ● Provide differentiated mentors
ELLs	● Pre-teach new vocabulary and meaning of symbols ● Embed glossaries or definitions ● Provide translations ● Connect new vocabulary to background knowledge	● Provide flash cards ● Incorporate as many learning senses as possible ● Portray structure, relationships, and associations through concept webs ● Graphic organizers
At-risk	● Purposeful seating ● Counselor involvement ● Parent involvement	● Contracts ● Alternate assessments ● Hands-on learning
21st Century Skills		
● Creativity ● Innovation		● Problem Solving ● Communication

• Critical Thinking	• Collaboration
Integrating Technology	
• Chromebooks • Internet research • Online programs	• Virtual collaboration and projects • Presentations using presentation hardware and software

Architecture	**Grades 10-12**	**Unit 2:** Reading Plans and Using AutoCAD in Architecture	**Nine Weeks**

Performance Expectations		**Critical Knowledge and Skills**
8.2.12.ED.2	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.	Students will draw a floor plan on AutoCAD
9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.	Students will know and understand the architectural symbols and vocabulary
9.3.12.AC.6	Read, interpret and use technical drawings, documents and specifications to plan a project	Students will use an existing floor plan to reproduce the plan in AutoCAD

Formative Assessments	**Summative Assessments**
• Project benchmarks • Class Participation	• Finished Blueprints • Participation
Suggested Primary Resources	**Suggested Supplemental Resources**

• Blueprints • Architecture book	• AutoCAD book
Cross-Curricular Connections	
• Language arts- writing, logging, oral communication • Math-measurements, angles, radius • Science- environmental factors • Art- sketching and drawing	
Enduring Understanding (Core Idea)	**Essential Questions**
• Students will be able to read, understand, and develop architectural blueprints in AutoCAD	• What is a blueprint? • What do the symbols on a blueprint mean? • What is the drawing to scale? • How do I draw the symbols on AutoCAD? • How do I set up a blueprint on AutoCAD? • What is a titleblock? • What is a section?

Differentiation		
504	• preferential seating • extended time on tests and assignments • reduced homework or classwork • verbal, visual, or technology aids	• modified textbooks or audio-video materials • behavior management support • adjusted class schedules or grading • verbal testing
Enrichment	• Utilize collaborative media tools • Provide differentiated feedback • Opportunities for reflection •	• Encourage student voice and input • Model close reading • Distinguish long term and short term goals

IEP	• Utilize “skeleton notes” where some required information is already filled in for the student • Provide access to a variety of tools for responses • Provide opportunities to build familiarity and to practice with multiple media tools • Graphic organizers	• Leveled text and activities that adapt as students build skills • Provide multiple means of action and expression • Consider learning styles and interests • Provide differentiated mentors
ELLs	• Pre-teach new vocabulary and meaning of symbols • Embed glossaries or definitions • Provide translations • Connect new vocabulary to background knowledge	• Provide flash cards • Incorporate as many learning senses as possible • Portray structure, relationships, and associations through concept webs • Graphic organizers
At-risk	• Purposeful seating • Counselor involvement • Parent involvement	• Contracts • Alternate assessments • Hands-on learning
21st Century Skills		
• Creativity • Innovation • Critical Thinking		• Problem Solving • Communication • Collaboration
Integrating Technology		

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Architecture	**Grades 10-12**	**Unit 3:** Using Revit in Architecture	**Nine Weeks**

Focus Indicator		**Critical Knowledge and Skills**
8.2.12.ED.2	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.	Students will be able start a project in Revit and make changes on their project
9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction	Students will be able to use the vocab and symbols used in Revit
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.	Students will be able to manage project on Revit

Formative Assessments	**Summative Assessments**
• Project benchmarks • Class Participation	• Revit Book Chapter Exercises • Participation
Suggested Primary Resources	**Suggested Supplemental Resources**
• Revit Book	• Teacher generated powerpoints
Cross-Curricular Connections	
• Language arts- writing, logging, oral communication • Math-measurements, angles, radius • Science- environmental factors	

● Art- sketching and drawing	
Enduring Understanding	**Essential Questions**
● Students will learn the basics of the Revit program. This program is used for commercial and residential building.	● What is Revit? ● How is Revit different from AutoCAD? ● What is 3D modeling? ● What is a materials list? ● What is a family? ● What are the pros and cons of the Revit program?

Differentiation		
504	● preferential seating ● extended time on tests and assignments ● reduced homework or classwork ● verbal, visual, or technology aids	● modified textbooks or audio-video materials ● behavior management support ● adjusted class schedules or grading ● verbal testing
Enrichment	● Utilize collaborative media tools ● Provide differentiated feedback ● Opportunities for reflection ●	● Encourage student voice and input ● Model close reading ● Distinguish long term and short term goals
IEP	● Utilize “skeleton notes” where some required information is already filled in for the student ● Provide access to a variety of tools for responses ● Provide opportunities to build familiarity and to practice with multiple media tools ● Graphic organizers	● Leveled text and activities that adapt as students build skills ● Provide multiple means of action and expression ● Consider learning styles and interests ● Provide differentiated mentors

ELLs	• Pre-teach new vocabulary and meaning of symbols • Embed glossaries or definitions • Provide translations • Connect new vocabulary to background knowledge	• Provide flash cards • Incorporate as many learning senses as possible • Portray structure, relationships, and associations through concept webs • Graphic organizers
At-risk	• Purposeful seating • Counselor involvement • Parent involvement	• Contracts • Alternate assessments • Hands-on learning
21st Century Skills		
• Creativity • Innovation • Critical Thinking		• Problem Solving • Communication • Collaboration
Integrating Technology		
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Architecture	**Grades 10-12**	**Unit 4:** Designing Your Own Structure	**Nine Weeks**

Focus Indicator		Critical Knowledge and Skills
8.2.12.ED.1	Use research to design and create a product or system that addresses a problem and make modifications based on input from potential consumers.	Students will design and draft a building of their own
8.2.12.ED.2	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.	The students will create drawings for their building
8.2.12.ED.3	Evaluate several models of the same type of product and make recommendations for a new design based on a cost benefit analysis	The students will choose what type of building todesign
8.2.12.ED.4	Design a product or system that addresses a global problem and document decisions made based on research, constraints, trade-offs, and aesthetic and ethical considerations and share this information with an appropriate audience.	Students will decide on materials and style based on the constraints
8.2.12.ED.5	Evaluate the effectiveness of a product or system based on factors that are related to its requirements, specifications, and constraints (e.g., safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, ergonomics).	While designing the building, the students will take into consideration things like safety and quality control
8.2.12.ITH.2	Propose an innovation to meet future demands supported by an analysis of the potential costs, benefits, trade-offs, and risks related to the use of the innovation.	Students will consider things like solar panels to run their building
9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.	Students will use the appropriate symbols for their drawings
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.	Students will design and create the building

9.3.12.AC.5	Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.	Students will be able to explain the roles of all the professionals in designing and erecting a building
9.3.12.AC.6	Read, interpret and use technical drawings, documents and specifications to plan a project.	Students will create the technical drawings
9.3.12.AC.7	Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.	Students will know what each profession contributes to the building process
9.3.12.AC-DES.4	Apply building codes, laws and rules in the project design.	Students will apply at least three building codes and document them

Formative Assessments	**Summative Assessments**
● Project benchmarks ● Class Participation	● Finished Project ● Participation
Suggested Primary Resources	**Suggested Supplemental Resources**
● AutoCAD Book ● Revit Book ● Building Codes per State	● Teacher powerpoints
Cross-Curricular Connections	
● Language arts- writing, logging, oral communication ● Math-measurements, angles, radius ● Science- environmental factors ● Art- sketching and drawing	
Enduring Understanding	**Essential Questions**
● Students will continue to expand their knowledge of architecture and the programs used throughout the year.	● Should I do a residential or commercial building? ● What program should I use? ● What are the environmental concerns should I have? ● How big should my building be? ● Do I have a budget?

	● What is my timeline?

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APPENDIX A

SOFTWARE NAMES:

- AutoCAD
- Revit
- Google Classroom

APPENDIX B

ASSESSMENT:

LIST OF ASSESSMENT/TYPE:

Projects (50% of grade)
Progress Grades (25% of grade)
Participation (25% of grade)

APPENDIX C

SAMPLE INTERDISCIPLINARY UNITS

Architecture would match up well with math and history classes. There are so many numbers involved with designing a structure that math is an easy candidate for an interdisciplinary unit. From measuring distance to testing material strength, math is a huge part of architecture. History would work well with architecture because the history of architecture is vast. As time periods change, styles of architecture and materials used changed as well. Structures are able to be dated based on the building styles and materials.