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ABC and Ohio Academic Content Standards

Through the design process, multiple curricula are required to be utilized, synthesized and directed at the common goal of solving the design problem. With the annual ABC project, students in all grades engage at a personal level with the social, societal, and physical properties of the built environment through thoughtful assessment, collaboration, communication and self expression.

The following State of Ohio ACS standards can be addressed through the process of completing an Architecture By Children project. This list is not exhaustive, but meant to show the breadth of knowledge and information which can be incorporated into the program. Participating educators are encouraged to use the project across multiple disciplines and utilize their assigned architect and ABC Committee members in identifying ways to tie desired benchmarks to related activities within the design process for the specific ABC project.

Science

Standard 1: Earth and Space Sciences

Benchmarks:

- Grades K – 2 Explain that living things cause changes on Earth.
Describe what resources are and recognize some are limited but can be extended through recycling or decreased use.
- Grades 3 – 5 Describe Earth's resources and the ways in which they can be conserved.
- Grades 9 – 10 Describe the finite nature of Earth's resources and those human activities that can conserve or deplete Earth's resources.
- Grades 11 – 12 Explain that humans are an integral part of the Earth's system and the choices humans make today impact natural systems in the future.

Standard 4: Science and Technology

Benchmarks:

- Grades K – 2 Explain why people, when building or making something, need to determine what it will be made out of and how it will affect other people and the environment.
Explain that to construct something requires planning, communication, problem-solving, and tools.
- Grades 3 – 5 Describe and illustrate the design process.
- Grades 6 – 8 Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, and aesthetics).
- Grades 9 – 10 Explain the ways in which the processes of technological design respond to the needs of society.



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Grades 11 – 12 Predict how human choices today will determine the quality and quantity of life on Earth.

Social Studies

Standard 3: Geography

Benchmarks:

- Grades K – 2 Explain how environmental processes influence human activity and ways humans depend on and adapt to the environment.
- Grades 3 – 5 Identify and explain ways people have affected the physical environment of North America and analyze the positive and negative consequences.
- Grades 6 – 8 Explain how the environment influences the way people live in different places and the consequences of modifying the environment.
- Grades 9 – 10 Analyze the cultural, physical, economic, and political characteristics that define regions and describe reasons that regions change over time.
- Grades 11 – 12 Explain how the character and meaning of a place reflects a society's economics, politics, social values, ideology, and culture.
Evaluate the consequences of geographic and environmental changes resulting from governmental policies and human modification to the physical environment.

Standard 6: Citizen Rights and Responsibilities

Benchmarks:

- Grades K – 2 Describe the results of cooperation in group settings and demonstrate the necessary skills.
Demonstrate personal accountability, including making choices and taking responsibility for personal actions.
- Grades 3 – 5 Explain how citizens take part in civic life in order to promote the common good.
- Grades 6 – 8 Show the relationship between civic participation and attainment of civic and public goals.
- Grades 9 – 10 Explain how individual rights are relative, not absolute, and describe the balance between individual rights, the rights of others, and the common good.
- Grades 11 – 12 Explain how the exercise of a citizen's rights and responsibilities helps to strengthen a democracy.

Standard 7: Social Studies Skills and Methods

Benchmarks:

- Grades K- 2 Obtain information from oral, visual, print, and electronic resources.
Communicate information orally, visually, or in writing.
Identify a problem and work in groups to solve it.



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- Grades 3 – 5 Obtain information from a variety of primary and secondary sources using the component parts of the sources.
Use a variety of sources to organize information and draw inferences.
Use problem-solving skills to make decisions individually and in groups.
- Grades 6 – 8 Analyze different perspectives on a topic obtained from a variety of sources.
Organize historical information in text or graphic format and analyze the information in order to draw conclusions.
Work effectively in a group.
- Grades 9 – 10 Evaluate the reliability and credibility of sources.
- Grades 11 – 12 Critique data and information to determine the adequacy of support for conclusions.
Develop a research project that identifies the various perspectives on an issue and explain a resolution of that issue.
Work in groups to analyze an issue and make decisions.

Technology

Standard 1: Nature of Technology

Benchmarks:

- Grades K- 2 Recognize the characteristics and scope of technology.
Describe the relationships among technologies and the connections between technology and other fields of study.
- Grades 3 – 5 Compare and discuss the relationships among technologies and the connections between technology and other fields of study.
- Grades 6 – 8 Analyze information relative to the characteristics of technology and apply in a practical setting.
Apply the core concepts of technology in a practical setting.
Analyze the relationships among technologies and explore the connections between technology and other fields of study.
- Grades 9 – 10 Apply technological knowledge in decision-making.
- Grades 11 - 12 Examine the synergy between and among technologies and other fields of study when solving technological problems.

Standard 2: Technology and Society Information

Benchmarks:

- Grades K- 2 Recognize that technology has an interrelationship with the environment.
Describe and demonstrate how technology has had an influence on our world.
Collect information about products and discuss whether solutions create positive or negative results.
- Grades 3 – 5 Define responsible citizenship relative to technology.
Investigate and explain the interrelationships between technology and the environment.



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Grades 6 – 8 Analyze technologically responsible citizenship.
Describe and explain the impact of technology on the environment.
Describe how design and invention have influenced technology throughout history.

Grades 9 – 12 Demonstrate the relationship among people, technology, and the environment.
Interpret and evaluate the influence of technology throughout history and predict its impact on the future.

Standard 3: Technology for Productivity Applications

Benchmarks:

- Grades K- 2 Use productivity tools to produce creative works.
- Grades 3 – 5 Use productivity tools to produce creative works and prepare publications.
- Grades 6 – 8 Use productivity tools to produce creative works, to prepare publications, and to construct technology-enhanced models.
- Grades 9 – 12 Identify, select, and apply appropriate technology tools and resources to produce creative works and to construct technology-enhanced models.

Standard 5: Technology and Information Literacy

Benchmarks:

- Grades K- 2 Use a simple research process model which includes deciding what to use, finding resources, using information, and checking work to generate a product. Apply basic browser information and navigation skills to find information from the Internet.
- Grades 3 – 5 Use the Internet to find, use, and evaluate information.
- Grades 6 – 8 Use technology to conduct research and follow a research process model which includes the following: developing essential question; identifying resources; selecting, using, and analyzing information; synthesizing and generating a product; and evaluating both process and product.
- Grades 9 – 12 Apply a research process model to conduct research and meet information needs.

Standard 6: Design

Benchmarks:

- Grades K- 2 Identify problems and potential technological solutions.
Understand that changes in design can be used to strengthen or improve an object.
- Grades 3 – 5 Describe and apply a design process to solve a problem.
Describe how engineers, architects, and designers define a problem, creatively solve it, and evaluate the solution.
Understand the role of troubleshooting in problem-solving.
- Grades 6 – 8 Evaluate the aesthetic and functional components of a design and identify creative influences.
Recognize the role of engineering design and of testing in the design process.



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Understand and apply research, innovation, and invention to problem-solving.

- Grades 9 – 12 Identify and produce a product or system using a design process, evaluate the final solution, and communicate the findings.
Recognize the role of teamwork in engineering design and of prototyping in the design process.
Understand and apply research, development, and experimentation to problem-solving.

Standard 7: Designed World

Benchmarks:

- Grades K – 2 Develop an understanding of the goals in physical technologies.
Develop an understanding of the goals of informational technologies.
- Grades 3 – 5 Develop an understanding of how physical technologies enhance our lives.
Recognize appropriate modes of technical communication across technological systems.
- Grades 6 – 8 Develop an understanding of and be able to select and use physical technologies.
Develop an understanding of and be able to select and use information technologies.
- Grades 9 – 12 Classify, demonstrate, examine, and appraise energy and power technologies.
Classify, demonstrate, examine, and appraise transportation technologies.
Classify, demonstrate, examine, and appraise manufacturing technologies.
Classify, demonstrate, examine, and appraise construction technologies.
Classify, demonstrate, examine, and appraise communication technologies.

Fine Arts

Standard 1: Historical, Cultural, and Social Contexts

Benchmarks:

- Grades K – 4 Identify art forms, visual ideas, and images and describe how they are influenced by time and culture.
- Grades 5 – 8 Compare and contrast the distinctive characteristics of art forms from various cultural, historical, and social contexts.
- Grades 9 – 12 Explain how and why visual art forms develop in the contexts (e.g., cultural, historical, political, and historical) in which they were made.

Standard 2: Creative Expression and Communication

Benchmarks:

- Grades K – 4 Develop and select a range of subject matter and ideas to communicate meaning in two- and three-dimensional works of art.
- Grades 5 – 8 Create two- and three-dimensional original artwork that demonstrates personal visual expression and communication.
Use current available technology to refine an idea and create an original, imaginative work of art.



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Grades 9 – 12 Create expressive artworks that demonstrate a sense of purpose and understanding of the relationship among form, materials, techniques, and subject matter.

Standard 3: Analyzing and Responding

Benchmarks:

- Grades K – 4 Identify and describe the visual features and characteristics in works of art. Contribute to the development of criteria for discussing and judging works of art.
- Grades 5 – 8 Apply the strategies of art criticism to describe, analyze, and interpret selected works of art. Establish and use criteria for making judgments about works of art.
- Grades 9 – 12 Explain how form, subject matter, and context contribute to meanings in a work of art. Critique their own works, the works of peers, and other artists on the basis of formal, technical, and expressive aspects in the works.

Standard 5: Connections, Relationships, and Applications

Benchmarks:

- Grades K – 4 Create and solve an interdisciplinary problem using visual art processes, materials, and tools.
- Grades 5 -8 Demonstrate the role of visual arts in solving an interdisciplinary problem. Apply and combine visual art, research, and technology skills to communicate ideas in visual form.
- Grades 9 – 12 Formulate and solve a visual art problem using strategies and perspectives from other disciplines.

Language Arts

Standard 1: Acquisition of Vocabulary

Benchmarks:

- Grades 4 – 12 Use multiple resources to enhance comprehension of vocabulary.

Standard 3: Concepts of Print, Comprehension Strategies, and Self-Monitoring Strategies

- Grades K – 3 Demonstrate comprehension by responding to questions (e.g., literal, informational, and evaluative).
- Grades 4 – 7 Make meaning through asking and responding to a variety of questions related to text.
- Grades 8 – 12 Demonstrate comprehension of print and electronic text by responding to questions (literal, inferential, evaluative, and synthesizing).

Standard 4: Informational, Technical, and Persuasive Text

- Grades K – 3 Ask clarifying questions concerning essential elements of informational text.



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Grades 4 – 7 Analyze and draw inferences from text content to gain additional information.

Standard 6: Writing Process

Benchmarks:

- Grades K – 2 Publish writing samples for display or sharing with others using techniques such as electronic sources and graphics.
- Grades 3 – 4 Prepare writing for publication that follows an appropriate format and use techniques such as electronic resources and graphics.
- Grades 5 – 7 Select more effective vocabulary when writing or editing by using a variety of resources and reference materials.
- Grades 8 – 12 Prepare writing for publication that follows an appropriate format and uses a variety of techniques to enhance the final product.

Standard 7: Writing Applications

Benchmarks:

- Grades K – 2 Compose writing that conveys a clear message and includes well-written details.
- Grades 3 – 4 Write informational reports that include facts, details, and examples to illustrate important ideas.
- Grades 5 – 7 Produce informational essays or reports that convey a clear and accurate perspective and support the main ideas with facts, details, examples, and explanations.
- Grades 8 – 10 Use documented textual evidence to justify interpretation or to support a research topic.
- Grades 11 – 12 Produce functional documents that report, organize, and convey information and ideas accurately.

Standard 9: Research

Benchmarks:

- Grades K – 2 Generate questions for investigation and gather information from a variety of sources
- Grades 3 – 4 Identify a topic of study, construct questions, and determine appropriate resources for gathering information.
Communicate findings orally, visually, and in writing.
- Grades 5 – 7 Formulate open-ended research questions suitable for inquiry and investigation.
Communicate findings orally, visually, and in writing.
- Grades 8 – 10 Formulate open-ended research questions suitable for investigation and adjust questions as necessary while research is conducted.
Communicate findings, reporting on the substance and processes, orally, visually, and in writing.



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Grades 11 – 12 Formulate open-ended research questions suitable for inquiry and investigation and adjust questions as necessary while research is conducted. Communicate findings, reporting on the substance and processes, orally, visually, and in writing.

Standard 10: Communications (Oral and Visual)

Benchmarks:

- Grades K – 2 Use active listening strategies and ideas to identify the main idea and to gain information from oral presentations.
Connect prior experiences, insights, and ideas to those of a speaker.
- Grades 3 – 4 Demonstrate active listening strategies by asking clarifying questions and responding to questions with appropriate elaboration.
Respond to presentations by stating the purpose and summarizing main ideas.
- Grades 5 – 7 Use effective listening strategies, summarize major ideas, and draw logical inferences from presentation and visual media.
Explain a speaker's point of view.
- Grades 8 – 10 Use a variety of strategies to enhance listening comprehension.
Analyze the techniques used by speakers to evaluate the effect it has on the message.
- Grades 11 – 12 Use a variety of strategies to enhance listening comprehension.
Select and use effective speaking strategies for a variety of audiences, situations, and purposes.

Mathematics

Standard 1: Numbers, Number Sense, and Operations

Benchmarks:

- Grades 5 – 7 Use models and pictures to relate concepts of ratio, proportion, and percentage.
- Grades 8 – 10 Estimate, compute, and solve problems involving ratio, proportion, and percentage and explain solutions.

Standard 2: Measurement

- Grades K – 2 Select appropriate units for measurement.
Develop common referents for units of measure to make comparisons and estimates.
Apply measurement techniques.
- Grades 3 – 4 Develop common referents for units of measure to make comparisons and estimates.
Identify appropriate tools and apply counting techniques for measuring length, perimeter, and area.
- Grades 5 – 7 Select appropriate units to measure angles, circumference, and surface area.



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Convert units of measure within the same measurement system.
Identify appropriate tools and apply appropriate techniques for measuring.
Select a tool and measure accurately to a specified level of precision.
Use problem-solving techniques and technology as needed to solve problems involving measurement.

- Grades 8 – 10 Solve increasingly complex non-routine measurement problems and check for reasonableness of results.
Use formulas to find surface area for specified three-dimensional objects accurately and to a specified level of precision.
Estimate and compare various measurement attributes to a specified level of precision.
Write and solve real-world multi-step problems and verify reasonableness of solutions.
- Grades 9 – 12 Apply various measurement scales to describe phenomena and solve problems.
Estimate and compute areas in increasingly complex problem situations.

Standard 3: Geometry and Spatial Sense

Benchmarks:

- Grades K – 2 Describe solid objects (cube, sphere, etc.) and identify them in the environment.
Describe location using comparative, directional, and positional words.
- Grades 3 – 4 Use attributes to describe, classify, and sketch plane figures and to build solid objects.
Describe, identify, and model reflections, rotations, and translations using physical materials.
- Grades 5 – 7 Use proportions to express relationships among corresponding parts of similar figures.
Describe and use the concepts of congruency, similarity, and symmetry to solve problems.
Apply properties of equality and proportionality to solve problems involving congruent or similar figures (e.g., create a scale drawing).
- Grades 8 – 10 Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools.
Solve problems involving two- and three-dimensional objects represented within a coordinate system.
Establish the validity of conjecture about geometric objects, their properties, and relationships with inductive and deductive reasoning.
- Grades 11 – 12 Use trigonometric relationships to verify and determine solutions in problem situations.

Standard 6: Mathematical Processes

Benchmarks:



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- Grades K – 2 Use a variety of strategies to understand problem situations (e.g., discussing with peers, stating problem in own words, modeling problems with diagrams or physical materials).
Draw pictures and use physical models to represent problem situations and solutions.
- Grades 3 – 4 Use mathematical strategies that relate to other curriculum areas and the real world.
- Grades 5 – 7 Apply and adapt problem-solving strategies to solve a variety of problems including routine and non-routine problem situations.
Relate mathematical ideas to one another and to other content areas.
- Grades 8 – 10 Apply mathematical knowledge and skills routinely in other content areas and practical situations.
Use a variety of mathematical representations flexibly and appropriately to organize, record, and communicate mathematical ideas.
- Grades 11 – 12 Communicate mathematical ideas orally and in writing with a clear purpose appropriate for a specific audience.
Apply mathematical modeling to workplace and other situations.