

Fifth Grade Unit 1: Homemade Arcade

Nintendo has decided to open up a museum dedicated to the history of gaming, and you have been chosen to present an original arcade game to the company for consideration. If your arcade game fulfills all of their requirements, you and your family will be invited to the museum's Grand Opening Gala and reception.

The requirements that must be met in order to qualify for the Grand Prize are as follows:

1. Research the history of arcades and how to create DIY arcade games in order to determine a theme that might appeal to Nintendo's museum and a arcade game style that appeals to your personal preferences, willingness and ability. (Themes are guided by the "Star Wars" rule.)
2. Draw a 2-D representation of your proposed plan. The surface area of the exterior of your game must be between 800 and 1000 square inches, and your decorative additions must stay within the \$300 budget. The game must have at least 5 moving mechanisms that are either self-activated or activated from outside of the game.
3. Build a 3-D working model of your arcade game that has a clear theme illustrated through the title, design, decor, and even the mechanisms.
4. Develop and deliver an informational presentation that explains how your game is related to the history of gaming.

Nintendo Presents: The Homemade Arcade

Project Elements	Meets/ exceeds expectations	Almost meets expectations	Misses most expectations
The design plan for your arcade game meets all mathematical requirements.			
The 3-D model of your arcade game design follows your plan with adjustments or adaptations noted on your design.			
The 3-D model of your arcade game is cut, drawn and created neatly using straight lines when appropriate,			
The arcade game incorporates at least 5 moving elements that can be activated from the outside of the game, such as an activation slot, a retractable claw, a spring loaded ball release, flippers, etc.			
The arcade game has a definite theme that is easily identifiable through the game's title, decor, and extra features.			
The presentation professionally explains the game and it's connection to the history of gaming. (Video or Tri-Board)			

ELA Literacy Reading Informational

- CCSS.ELA-LITERACY.RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- CCSS.ELA-LITERACY.RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-LITERACY.RI.5.6 Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.
- CCSS.ELA-LITERACY.RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
- CCSS.ELA-LITERACY.RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- CCSS.ELA-LITERACY.RI.6.9 Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).
- CCSS.ELA-LITERACY.W.6.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- CCSS.ELA-LITERACY.W.6.2.A Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- CCSS.ELA-LITERACY.W.6.2.B Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
- CCSS.ELA-LITERACY.W.6.2.C Use appropriate transitions to clarify the relationships among ideas and concepts.
- CCSS.ELA-LITERACY.W.6.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
- CCSS.ELA-LITERACY.W.6.2.E Establish and maintain a formal style.

- CCSS.ELA-LITERACY.W.6.2.F Provide a concluding statement or section that follows from the information or explanation presented.
- CCSS.ELA-LITERACY.W.6. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.
- CCSS.ELA-LITERACY.W.6.8 Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

Math Standards:

- CCSS.MATH.CONTENT.5.NBT.A.4 Use place value understanding to round decimals to any place.
- CCSS.MATH.CONTENT.5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.
- CCSS.MATH.CONTENT.5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
- CCSS.MATH.CONTENT.6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. **Area of Triangles, Composing decomposing complex**
- CCSS.MATH.CONTENT.6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. **Net Surface Area**

NGSS Standards: The understanding of forces and motion along with the engineering and design process are going to be fundamental for success in this unit.

- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Science and Engineering Practices Asking Questions and Defining Problems Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying

qualitative relationships. Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.

(3-5-ETS1-1) Planning and Carrying Out Investigations **Planning and carrying out investigations to answer questions or test solutions to problems** in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.

(3-5-ETS1-3) Constructing Explanations and Designing Solutions **Constructing explanations and designing solutions** in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.

(3-5-ETS1-2) Disciplinary Core Ideas ETS1.A: Defining and Delimiting Engineering Problems Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.

(3-5-ETS1-1) ETS1.B: Developing Possible Solutions Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions.

(3-5-ETS1-2) At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.

(3-5-ETS1-2) Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.

(3-5-ETS1-3) ETS1.C: Optimizing the Design Solution Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.

The Invent Washington Program also provides access to the following NGSS Practices:

- NGSS Practice: Asking questions (for science) and defining problems (for engineering.)
- NGSS Practice: Developing and using models
- NGSS Practice: Planning and carrying out investigations.
- NGSS Practice: Using mathematics and computational thinking
- NGSS Practice: Constructing explanations (for science) and designing solutions (for engineering)

The “I’m Not Just Gifted” Curriculum will be a resource I will be using during this unit to develop the following NAGC K-12 Gifted Standards

<p>1.1. Self-Understanding: Students with gifts and talents demonstrate self-knowledge with respect to their interests, strengths, identities and needs in socio-emotional development and in intellectual, academic, creative, leadership, and artistic domains.</p>	<p>1.1.1. E. engage students with gifts and talents in identifying interests, strengths, and gifts 1.1.2. E. assist students with gifts and talents in developing identities supportive of achievement.</p>
<p>1.2. Self-Understanding: Students with gifts and talents possess a developmentally appropriate understanding of how they learn and grow; they recognize the influences of their beliefs, traditions, and values on their learning and behavior.</p>	<p>1.2.1. E. develop activities that match each student’s developmental level and culture-based learning needs.</p>
<p>1.3. Self-Understanding: Students with gifts and talents demonstrate understanding of and respect for similarities and differences between themselves and their peer group and others in the general population</p>	<p>1.3.1. E. provide a variety of research based grouping practices for students with g/t that allow them to interact with individuals of various gifts, talents, abilities and strengths. 1.3.2. E. model respect for individuals with diverse abilities, strengths, and goals.</p>