Grade 4 STEAM - Unit 2 - My Beastie and I

Unit Focus

Building off the knowledge gained in unit one of the fourth grade STEAM unit, students will continue expand their knowledge of vector art and motion. To begin the students will learn how to draw a rendition of themselves as a Funko Pop style character. The character drawing will be imported into a vector art program on the iPad. Using layers, the students will recreate their character in a digital format. The character will be color printed about 4 inches tall. Next, the students will create a beastie friend of their own design. The beastie will be powered by Sphero and constructed of paper base. The students will need to utilize their knowledge from unit one to successfully create a beastie that can run and be controlled via robot power. The digitalized characterization of themselves will ride upon their beastie to compete in races and the culminating activity of a battle to be the last beastie standing.

Stage 1: Desired Results - Key Understandings

Standard(s)

Standards

- Common Core
  - *Mathematics: 4*
    - Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
    - Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. *(CCSS.MATH.CONTENT.4.G.A.1)*
    - Mathematical Practices
    - Use appropriate tools strategically. *(CCSS.MATH.MP.5)*
    - Attend to precision. *(CCSS.MATH.MP.6)*
    - Look for and make use of structure. *(CCSS.MATH.MP.7)*
- ITEEA - Standards for Technological Literacy
  - *Technological Literacy: K-12*
    - Design
    - Students will develop an understanding of the attributes of design. *(8)*
    - Students will develop an understanding of engineering design. *(9)*
    - Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving. *(10)*
- National Core Arts Standards
  - *Visual Arts: 4*
    - Investigate: Organize and develop artistic ideas and work. *(VA:Cr2.1.4)*
    - Explore and invent art-making techniques and approaches. *(VA:Cr2.1.4.a)*

Transfer

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

T1 Make observations and ask questions to define a problem based on prior knowledge and curiosity that stimulates further exploration, analysis, and discovery.

Meaning

Understanding(s)	Essential Question(s)
Students will understand that... **U1** Mathematicians apply the mathematics they know to solve problems occurring in everyday life. **U2** Artists make thoughtful choices about their use of skills, technique, and style to in hopes of creating a specific response for an audience. **U3** The pattern of an object's motion in various situations can be observed and measured from which predictions can be made.	*Students will keep considering...* **Q1** How did it go / how did it turn out so far? How does it measure up to the established criteria? What is important to focus on next? **Q2** Based on current information, how do I develop a testable design? 3-12 **Q3** What do the results tell me? What patterns do I see or what conclusions can I draw? **Q4** What is another way that this problem could be solved?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
Students will know... **K1** Controlling a robot through code takes practice, precision, and patience.	*Students will be skilled at...* **S1** Selecting the correct tool for their intended purpose in a vector art program.

Stage 1: Desired Results - Key Understandings

▪ When making works of art, utilize and care for materials, tools, and equipment in a manner that prevents danger to oneself and others. *(VA:Cr2.2.4.a)* ▪ Reflect - Refine - Continue: Refine and complete artistic work. *(VA:Cr3.1.4)* ▪ Revise artwork in progress on the basis of insights gained through peer discussion. *(VA:Cr3.1.4.a)* • Next Generation Science Standards (DCI) o *Science: 4* ▪ ENGINEERING, TECHNOLOGY & APPLICATIONS OF SCIENCE ▪ 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. *(ETS1.4.A1)* ▪ Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. *(ETS1.4.B3)* ▪ Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. *(ETS1.4.C1)* • NGSS/NSTA Science & Engineering Practices o *NGSS Science & Engineering Practices: 3-5* ▪ Asking Questions and Defining Problems: A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works and which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and identify constraints to solve problems about the designed world. Both scientists and engineers also ask questions to clarify ideas. *(SE.3-5.1)* ▪ Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. *(SE.3-5.1.3)* **Madison Public Schools Profile of a Graduate** o Idea Generation: Studying a problem, need or model (mentor text, political piece, documents, art work, etc.) to consider limitations and imagine new solutions/transformations. *(POG.2.1)* o Design: Engaging in a process to refine a product for an intended audience and purpose. *(POG.2.2)*	**K2** Proportion refers to the dimensions of a composition and relationships between height, width and depth. **K3** An armature in drawing is a basic stick figure with the addition of shapes used to help design your character.	**S2** Use a ruler to measure to the nearest 1/4 inch to create exact proportions. **S3** Using the design process to create, iterate, and produce a final model.