PEZ Design; From the inside out

Key Concept: Systems

Related Concept: Adaption and Form

Global Concepts: Scientific and Technical innovation

Statement of Inquiry: Systems of Measurement allow for creation of objects that are adapted and formed for a specific purpose to further scientific and technical innovation.

The History: The creation of a particularly fine peppermint candy in 1927 by Eduard Haas III in Austria marks the birth of PEZ. Originally introduced in small tins, the refreshing candy proved extremely popular. The name PEZ comes from the German word for peppermint, "Pfefferminz" taking the P from the first letter, E from the middle letter and Z from the last letter to form the now iconic brand name PEZ. The original shape of PEZ candy was round and called 'PEZ drops.' The candy quickly changed to the familiar brick shape. PEZ starts U.S. operations in 1952. In 1956, PEZ introduces an innovated dispenser called the space gun. In 1957, PEZ adds a three-dimensional character head to the top of a dispenser. The Halloween Witch becomes the first traditional character head dispenser in 1957, while Popeye adds to the variety as the first licensed character in 1958.

Questions
Factual: What systems do we use to measure.
Conceptual: How do we use tools to measure.
Debatable: Why do we use different systems and tools to measure.

Learning Activities
You are to measure a PEZ candy brick using a Vernier Caliper. Record the information and create your own PEZ dispenser that will hold a package of PEZ and distribute the candy one piece at a time. You may copy the traditional PEZ dispenser or create your own that meets the above criteria. You must measure and sketch your ideas, transfer those sketches to Tinkercad to represent the individual parts to be printed on a 3D printer and then assemble and demonstrate. Finally, you will reflect on the process so keep good notes in your Design Journal for reference.

Keep in mind
This assignment is about measurement and accurate transfer of said measurements between mediums.

- Physical item measured (PEZ candy brick)
- Extrapolation and creation drawn on paper (Sketches in Design Journal with measurements)
- Further refinement and creation digitally (Individual parts created in Tinkercad showing measurements)
- Physical item printed and used (Tinkercad files sent to printer and assembled after printing)

You should be careful to note tolerances and the need for accuracy. The adage measure twice and cut once applies to the world of 3D printing. Measure twice and print once. If your printing does not work the first time because you measured wrong you may not get a second chance to print, as many different students will also need printer time.

ATL Approach to Learning

- Social: Give and receive meaningful feedback
- Self-Management: Reflection skills-focus on the process of creating by imitating the work of other. Affective-Resilience-practice bouncing back after adversity, mistakes and failures, practice 'failing well'
- Thinking: Creative thinking-design improvements to existing machines, media and technologies Transfer combine knowledge, understanding and skills to create products or solutions

Criterion
Criterion A: Inquiring and analyzing
i. analyze a group of similar products that inspire a solution to the problem

Criterion B: Developing ideas
iv. develop accurate planning drawings/diagrams and outline requirements for the creation of the chosen solution.
Criterion C: Creating the solution
   ii. demonstrates satisfactory technical skills when making the solution
   iv. states one change made to the chosen design or plan when making the solution

Criterion D: Evaluating
   ii. explains the success of the solution against the design specification
   iii. describes how the solution could be improved

Rubric
Criterion A: Inquiring and analyzing
   The student does not reach a standard described by any of the descriptors below.
   
   1-2
   
   3-4
   iii. states the main features of an existing product that inspires a solution to the problem
   
   5-6
   iii. outlines the main features of an existing product that inspires a solution to the problem
   
   7-8
   iii. describes the main features of an existing product that inspires a solution to the problem

Criterion B: Developing ideas
   The student does not reach a standard described by any of the descriptors below.
   
   1-2
   
   3-4
   iv. creates a planning drawing/diagram or lists requirements for the creation of the chosen solution.
   
   5-6
   iv. creates a planning drawing/diagram and lists the main details for the creation of the chosen solution.
   
   7-8
   iv. creates a planning drawing/diagram, which outlines the main details for making the chosen solution.

Criterion C: Creating the solution
   The Student does not reach a standard described by any of the descriptors below.
   
   1-2
   ii. creates the solution, which functions poorly and is presented in an incomplete form.
   
   3-4
   ii. demonstrates satisfactory technical skills when making the solution
   iv. states one change made to the chosen design or plan when making the solution
   
   5-6
   ii. demonstrates competent technical skills when making the solution
   iv. states one change made to the chosen design and plan when making the solution.
   
   7-8
   ii. demonstrates excellent technical skills when making the solution
   iv. lists the changes made to the chosen design and plan when making the solution.

Criterion D: Evaluating
   The Student does not reach a standard described by any of the descriptors below.
   
   1-2
   ii. states the success of the solution.
   
   3-4
   ii. states the success of the solution against the design specification based on the results of one relevant test
   iii. states one way in which the solution could be improved
   
   5-6
   ii. states the success of the solution against the design specification based on relevant product testing
   iii. outlines one way in which the solution could be improved
   
   7-8
   ii. outlines the success of the solution against the design specification based on authentic product testing
   iii. outlines how the solution could be improved