**Marionette Challenge!**

**Fine Arts Standard(s):**

3.1.a Experiment with art media, processes, and techniques to generate ideas and express personal meaning

**Science Standard(s):**

1.D.1.a. Choose appropriate common materials for making simple mechanical constructions and repairing things.

1.D.1.b. Explain that something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected.

**Vocabulary:**

*Parts:* the elements of an object that work together to make a whole.

*Lever:* a bar that pivots about one point and is used to move an object at a second point by a force applied to a third.

Simple Machines: a tool that makes work easier through the use of few or no moving parts.

**Materials:**

* Collect found items in preparation for this activity like: takeout sandwich boxes, cereal and other types of boxes. Dowels, sticks, and small boards.
* Supply: construction paper, and string.
* Art materials for design: googly eyes, colored yarn, felt pieces, etc…

**Engage:**

 The Muppets are holding tryouts in your town for a new Muppet character made entirely of simple supplies. Guidelines are that the puppet must be made of common materials, and be constructed with simple machines to help it move. All designs will be analyzed for their creativity and functionality. You are encouraged to work in teams to help create the best possible design. No hand puppets allowed! Marionettes are the best, so try one of those. Good luck engineers!

Explore:

 Explore what a marionette is and how it works. Watch the video: [Puppet Control](http://app.discoveryeducation.com/explore). After logging in, search for “Puppet Control.” This is a 3 minute video introducing the basic controls of a marionette. Discuss how the control of marionettes uses simple machines like a lever pulled by a string. Explore the idea that attaching a string to the end of a stick turns it into a lever that can act as an arm or leg to a marionette. Explore how you can connect pieces.

Explain

 Give student groups sufficient time to plan their marionette. Give paper to draw plans and sketch preliminary ideas. Remind students that they do not have to stick exactly to their plans. As engineers they should change their designs to find what works best if something does not work. One assessment point will be their ability to adapt as engineers and create the best possible marionette as a team.

Provide supplies and instruct individual members to create specific parts of their marionette. Give time for planning and construction. Allow students to investigate how parts work together and how the parts are controlled. Give assistance and modifications where necessary. Some elements of creating the marionette may be a challenge. Encourage students to try connecting pieces of their puppet as simply as possible (using strips of construction paper, or string at joints.)

Extend

 Allow students time to add artistic elements to help express the ideas and plan for their marionette. Create descriptions of the mechanics and engineering of the teams marionettes. Instruct students that they need to describe how the marionette works, what it is made of, and what makes it special.

DI Options for assessment:

* Comic Strip sequencing the movements
* Demonstrate movements with the marionette accompanied by an oral presentation
* Conduct an interview with the creators of the marionette to explain how it works.
* Draw a poster diagraming the marionette and how it works
* Create a commercial advertising for the marionette
* Give a persuasive speech for why your marionette is the best

Evaluate

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Score point** | **3** | **2** | **1** | **0** |
| **Marionette uses simple machines to show movement.** | Marionette has multiple points of movement demonstrating the use of simple machines  | Marionette has limited points of movement that demonstrate simple machines | Marionette has points of movement but not simple machines | Marionette does not have any points of movement. |
| **Structure uses appropriate materials.** | Appropriate materials were selected and creatively modified in ways that made them even better.  | Appropriate materials were selected and there was an attempt at creative modification to make them even better. | Appropriate materials were selected but were not modified.  | Inappropriate materials were selected and contributed to a product that performed poorly.  |
| **Structure was modified from original blueprint based on testing.** | Clear evidence of troubleshooting, testing, and refinements based on data or scientific principles.  | Clear evidence of troubleshooting, testing and refinements.  | Some evidence of troubleshooting, testing and refinements.  | Little evidence of troubleshooting, testing or refinement.  |

Optional: Students may also wish to display all marionettes and hold a debate to discuss what techniques worked best for the marionette project. Allow all ideas and voices to be heard and record working techniques on chart paper, to be displayed with marionettes if wanted.