Marvelous Mechanical Marionettes & Simple Machines

Objective: Compare marionettes and their connections to Simple Machines
Hands-On Activity: Try out the puppets (Analyze artifacts) and use your body like it's a puppet machine.

"A Penguin in My Pocket" by Hunter Marionettes (Minneapolis, MN)

Penguin in my Pocket tells the fun-filled and quirky tale of a penguin scientist who crashes lands in the jungle when her experimental jetpack fails and how she works with an artistic monkey to find her way home encountering a sea monster along the way. This solo-puppeteer production features marionettes, rod puppets, audience member puppeteer's participation, and a concertina. Created and performed by puppeteer and engineer Kurt Hunter, Penguin in my Pocket highlights the importance of imagination in both art and science. The production's creative team includes director Laura Wilhelm, costume designer Robert Graff, composer Arthur Clyde and creative consultant Paul Mesner with assistance on painting, costuming, and music provided by Kathy Hunter .*The production of Penguin in my Pocket was supported by a grant from the Jim Henson Foundation. A proud part of the Atlanta Science Festival (March 10-25, 2023).*

- Themes: Animals, music, inventions, creative problem solving
- Puppetry Styles: Marionette, Rod
- Create-A-Puppet™: Playful Penguin String Puppet

SIMPLE MACHINES & MARIONETTES DEFINED

● A **simple machine** is a mechanical device which makes moving things easier.
● A **marionette** is a type of puppet that is controlled from above, and usually hangs from strings.
● Let's examine some **marionettes** to look for components which act as **simple machines** that help them work.

-> Some **Simple Machines** are: levers, pulleys, wedges, inclined planes, screws, wheels and axles. <-

As we look at examples, the teaching artist can lead with questions for the students in some cases such as:
- If a lever is like a sea-saw with a pivot in the middle, what part of this puppet (penguin) do you think is considered a LEVER?
- If a pulley is a string that goes through an eyelet, what part of this puppet (marionette with arm loop) is a pulley?
- You have to go up a ramp, or steps (which are a notched ramp) to get to a marionette bridge, what simple machine is that? (Inclined Plane)

- **LEVER:** Many Marionettes, including the Penguin puppet use a **LEVER**.
  For the Penguin, the wings are the load, there is a pivot point in the middle, and your hand provides the force to move the load. When you apply the force and move the load, the puppet can wave and dance!
- **PULLEY:** Some Marionettes use a **PULLEY**, when the string is guided through an eyelet.
- **LEVER** and and **WEDGE** combined: Scissors To MAKE a puppet!
- **SCREW: A**n inclined plane in a spiral. To BUILD a wooden puppet, screws may be needed to hold it together.
- **INCLINED PLANE** A Marionette Bridge needs one to lead up to it.
- **WHEELS & AXLES**: To get puppets up the ramp, you may need a cart

A group of Penguins: In the water: A raft. On the land: A waddle

GUIDING QUESTIONS AND STANDARDS CONNECTIONS

GRADE K: what materials are the puppets, set and costumes in the show made of and how does that affect their motion? What types of motion did you witness in the show?

- SKP1. Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes.
- SKP2. Obtain, evaluate, and communicate information to compare and describe different types of motion.

GRADE 1: if a penguin found itself in a jungle, what would it need to survive and how would it find it in that habitat? How is the monkey better-suited for the jungle?

- S1L1. Obtain, evaluate, and communicate information about the basic needs of plants and animals.

GRADE 2: Describe the physical properties of the penguin puppet (color, mass, length, texture, hardness, strength, absorbency, and flexibility). Is this puppet pushed or pulled to make it move and how do the changes in force affect the speed of its movement?

- S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects
- S2P2. Obtain, evaluate, and communicate information to explain the effect of a force (a push or a pull) in the movement of an object (changes in speed and direction).

GRADE 3: if a penguin found itself in a jungle, what would it need to survive and how would it find it in that habitat? How is the monkey better-suited for the jungle? What adaptations do those animals have to allow for survival?

- S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia

GRADE 4: where can you find simple machines in puppetry? How does force acting upon them change their motion?

- S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces.

GRADE 5: can you think of any uses or magnets and/or electricity in supporting of today's puppet show (think of how the show was created, how it traveled to get from MN to GA and how it's being performed today)?

- S5P2. Obtain, evaluate, and communicate information to investigate electricity
- S5P3. Obtain, evaluate, and communicate information about magnetism and its relationship to electricity.