

## ARTS IMPACT PROJECT BASED LEARNING UNIT PLAN

### Theater and STEM Infused PBL Unit

#### *Organizing Shared Playground Equipment*

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Grade Level: 3rd

#### **Project Idea:**

Design, create, and construct playground equipment organizers  
Make an instructional video sharing proper usage of the organizers

#### **Driving Question:**

How can we organize shared playground equipment?

#### **Unit Summary (Completed at end of project. Use for sharing out public product.)**

Students will create three separate playground equipment organizers (balls; jumprobes and hula hoops; chalk, frizbees, and tetherballs) that they will construct using their own agreed upon designs out of PVC piping and connectors. Students will then share proper usage of the organizers through an instructional video.

### Learning Targets and Assessment Criteria

**Target:** Designs a playground equipment organizer.

**Criteria:** Uses straws and marshmallows to engineer a model **OR** plans and drafts a model in Arts Journal.

**Target:** Uses knowledge of measurement to bring their model to scale.

**Criteria:** Measures and cuts (with supervision) PVC Pipe to fit required dimensions.

**Target:** Collaborates with others.

**Criteria:** Communicates ideas to others; makes compromises; incorporates input/feedback.

**Target:** Communicates how to use the playground equipment organizer properly.

**Criteria:** Uses body, movements, and actions in an instructional video about how to use the equipment.

#### **Vocabulary**

Arts:

Action  
Movement

Arts Infused:

Design  
Model

STEM:

Engineering  
Measurement

Social Emotional Learning:

Sharing

21<sup>st</sup> Century Skills:

Collaboration  
Communication  
Critical Thinking

#### **Materials**

**Resources (Websites, experts, texts)**

None

**Museum Artworks or Performance**

*Naked Molerat Gets Dressed* at Seattle Children's Theater, March 2018

**Materials**

PVC Pipes in various lengths, PVC connectors, and PVC Glue  
Casters  
Drill and screws  
PVC cutter  
Coffee straws/stirrers  
Arts Journals  
Mini Marshmallows or playdough  
Pom Pom balls (ball models)  
String (jumprope models)  
Toilet paper rolls (hula hoop models)  
Storage totes  
Tape measure  
Adobe Spark on iPads  
Class assessment worksheet

## Standards to Drive the Inquiry

### Arts

#### WA Arts Learning Standards

For the full description of each anchor standard and the grade level performance standards, see:

<http://www.k12.wa.us/Arts/Standards>

Anchor Standard 3: Refine and complete artistic work.

Performance Standard (TH:Cr3.1.3): a. Collaborate with peers to revise, refine, and adapt ideas to fit the given parameters of a drama theatre work. b. Participate and contribute to physical and vocal exploration in an improvised or scripted drama/theatre work. c. Practice and refine design and technical choices to support a devised or scripted drama/theatre work.

Anchor Standard 5: Develop and refine artistic techniques and work for presentation.

Performance Standard (TH:Pr5.1.3): a. Participate in a variety of physical, vocal, & cognitive exercises that can be used in a group setting for drama/theatre work.

Anchor Standard 2: Organize and develop artistic ideas and work.

Performance Standard (VA:Cr2.2.3): a. Demonstrate an understanding of the safe and proficient use of materials, tools, and equipment for a variety of artistic processes.

Performance Standard (VA:Cr2.3.3): a. Individually or collaboratively construct representations, diagrams, or maps of places that are part of everyday life.

### Math

#### Common Core State Standards (CCSS) in Math

<http://www.k12.wa.us/CoreStandards/Mathematics/default.aspx>

3.MD.4. Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

#### CCSS Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

### Science, Technology, Engineering

#### Next Generation Science Standards

<http://www.nextgenscience.org/search-standards>

3-5-ETS1-2 Engineering Design: 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 Engineering Design: 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.

#### Scientific and Engineering Practices

Using Mathematics and Computational Thinking  
Obtaining, Evaluating, and Communicating Information  
Constructing Explanations and Designing Solutions

### 21st Century Skills

<http://www.p21.org/our-work/resources/for-educators>

- Critical Thinking: *Asks clarifying questions; uses evidence to question or explain creative choices; constructs meaning.*
- Collaboration: *Communicates ideas to others; makes compromises; and incorporates input/feedback.*
- Communication: *Actively listens; expresses ideas – visually/physically/verbally; responds to others*

## Teacher Project Planning

(Questions for teachers.)

### 1. *What will the entry event be to launch this unit?*

Each of the three classrooms will have specific playground equipment strewn around the room in a messy and haphazard way. Students will be told that our principals are now requiring all classrooms to share all recess equipment and that they have five minutes to organize it in their room. Then tell them we forgot to say that it has to all be organized and put away at the top of the stairs... will this all fit there? We're going to need to build something that is portable, that rolls, and can organize these things in a useful way. "We're in charge of all the balls. How can we organize them so that they are less of a mess and accessible to all?"

### 2. *What resources might we need?*

*(Experts, fieldtrips, texts, websites, data, equipment, materials)*

PVC Pipes and Connectors, wheels to roll, sketchbooks, straws and marshmallows or playdough for designing, and other materials listed on page one in the materials box.

### 3. *What is the duration of this unit?*

Three 1.5 hour sessions, and a fourth 40 minute session to make instructional video.

### 4. *What will each individual student do?*

Start with straws and connectors for 10 minutes to concretely explore construction of an organizer individually.

### 5. *What will be group work?*

Looking at each other's self-designed models and working as a team to come up with a collaborative design.

### 6. *What will the formative assessments/moments for reflection be?*

*(Journal entries, plans, outlines, rough drafts, sketches, turn and talk, physical brainstorm, idea mapping, diagramming)*

Making models and collaborating with design teams, justifying their choices.

### 7. *What will the summative assessment/ public product be?*

*(Performance, exhibition, publication, public presentation, website, installation)*

Creating functional organizers for playground equipment, and instructional video of how to use them.

## Facilitating Student Understanding of the Problem

(Questions to guide student inquiry.)

1. *What do we know about this problem before we begin?*
2. *What do we need to learn in order to solve it?*
3. *Where will we look for resources?*
4. *Who is our audience? Who will be helped by our solution?*
5. *How will we share our solution?*
6. *How will we assess our own learning?*

## PBL Unit Outline of Inquiry

(Begin each step with a question. Follow that with a brief description of what students do to address the question.)

### Day One

#### 1. ***How can we organize this playground equipment?***

- The students start by participating in the entry event (see above).
- The students will work individually on models of organizers (or draft a model) after being shown the actual PVC Pipe and connectors that will be used on the final product.
- The students will collaborate in small groups to decide on one design to share with the class.
- The student groups will share their designs and justify their engineering choices. ("Why will your design work? What problems does it solve?") Then the class will vote on one design to actually build.

Student reflection and assessment: Uses straws and marshmallows to engineer a model **OR** plans and drafts a model in Arts Journal. Communicates ideas to others; makes compromises; incorporates input/feedback.

### Day Two

#### 2. ***How can we make this so it works for everyone? How do we decide what size it will be (door width, height for K-5, etc.)?***

- The students will do work measuring and determining what the actual size will be for the organizer (width by door, height by kindergartener, length by wall size) and why these things matter (rolling through specific door, accessible by all kids K-5, knowing the dimensions of the wall space the organizers will be stored against).

- The students will measure, cut (with supervision), and begin building with PVC Pipe and connectors.

☑ Student reflection and assessment: Measures and cuts (with supervision) PVC Pipe to fit required dimensions. Communicates ideas to others; makes compromises; incorporates input/feedback.

### Day Three

#### 3. *What do we have left to do to complete our organizer?*

- The students will continue and finish building their organizers.

☑ Student reflection and assessment: Measures and cuts (with supervision) PVC Pipe to fit required dimensions. Communicates ideas to others; makes compromises; incorporates input/feedback.

### Day Four

#### 4. *How do we share how we use the organizers with the whole school?*

- The students will brainstorm and list how to use the equipment organizers properly.
- The students will storyboard a video about how to use the new equipment organizers.
- The students will review and practice theater skills they will need to act in their video.
- The students will create a video with adult help to put into Husky News. The video will show how to use and how to care for the new equipment organizers.

☑ Student reflection and assessment: Uses body, movements, and actions in an instructional video about how to use the equipment.

### Public Product/Sharing

Who is our audience?

All the people in our school building

Begin with a question, followed by the description of the culminating event that shares the learning from the PBL unit.

*How do we use and care for our new equipment organizers?*

We will use a video created with students shown during Husky News to share how to use the new organizers.

**ARTS IMPACT LESSON PLAN Theater and STEM Infused PBL Unit**

Third Grade: *Organizing Shared Playground Equipment*

**CLASS ASSESSMENT WORKSHEET**

The following assessment checklist can be used along with other assessment tools developed by teachers and students.

Disciplines	SCIENCE	MATH	21 <sup>ST</sup> CENTURY SKILL	THEATER	Total
Concept	Engineering	Measurement	Collaboration	Performance	4
Criteria	Uses straws and marshmallows to engineer a model <b>OR</b> plans and drafts a model in Arts Journal.	Measures and cuts (with supervision) PVC Pipe to fit required dimensions.	Communicates ideas to others; makes compromises; incorporates input/feedback.	Uses body, movements, and actions in an instructional video about how to use the equipment.	
Student Name					
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27.					
28.					
29.					
30.					
Total					
Percentage					

*What was effective in the unit? Why?*

*What do I want to consider for the next time I teach this unit?*

*What were the strongest connections between arts discipline and STEM?*

Teacher: \_\_\_\_\_ Date: \_\_\_\_\_

**ARTS AND STEM INFUSED PBL UNIT: *Organizing Shared Playground Equipment***

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Dear Family:

We are engaged in a **theater-infused project based learning** unit in which we are trying to solve this challenge:

**Driving Question:**

How can we organize shared playground equipment?

- We designed models of possible organizers for playground equipment that everyone at our school can use.
- We built a playground equipment organizer to scale using PVC pipe and connectors.
- We created an instructional video on proper use of the organizers we made.

At home, you could extend the learning by finding a need for an organizer and having your child design one with you.