**ARTS IMPACT LESSON PLAN**

**Theater & Science: Engineering/Design Infused Lesson**

***Designing and Building Statues***

Authors: Dave Quicksall

**Enduring Understanding**

Identifying key attributes of a given problem can lead to the engineering and designing of an effective model that represents that problem.

**Lesson Description (Use for family communication and displaying student art)**

*In this science, technology, and engineering lesson, students explore the theater concepts of collaboration, character, and action by copying a partner and creating statues. They use the science skills of engineering and design by building statues, with their partner’s body, that represent a specific concept. They describe and justify their scientific choices by making sketches of their designs and sharing them with peers.*

**Learning Targets and Assessment Criteria**

**Target:** Collaborates with a partner.

**Criteria:** Follows the directions/physical cues of another student by copying his/her movements.

**Target:** Uses design to engineer a solution to a dramatic/scientific problem.

**Criteria:** Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept.

**Target:** Analyzes design choices.

**Criteria:** Develops a simple sketch to illustrate the function of his/her model (statue).

**Target:** Communicates design choices to peers.

**Criteria:** Presents his/her statue and justifies its specific attributes/features.

**Materials**

**Museum Artworks or Performance**

### Seattle, WA

Seattle Children’s Theatre

### Tacoma, WA

Broadway Center for the Performing Arts

**Materials**

Newspaper; Student worksheets and pencils; Classroom Assessment Worksheet; Arts Impact sketchbooks

**Vocabulary**

Arts Infused:

Attribute

Collaborate

Design

Model

Science/Engineering Vocabulary:

Design Solution

Engineering Problem

Arts:

Action

Mirror

Mold

Neutral

Statue

**Learning Standards**

**Next Generation Science Standards**

[*http://www.nextgenscience.org/next-generation-science-standards*](http://www.nextgenscience.org/next-generation-science-standards)

**Topic:**

Engineering Design

**Disciplinary Core Ideas:**

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions

ETS1.C: Optimizing the Design Solution

Variable Core Ideas are also explored depending on the Science Concept or Process that is specifically used.

**Foss Science Kits Addressed:**

PreK: Building Structures

K: Animals

1: Organisms, Weather

2: Liquids

3: Rocks and Minerals, Plant Growth and Development

4: Circuits and Pathways

5: Models and Designs

**Performance Expectations:**

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

3-5-ETS1-1. Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1.2. 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.

**Crosscutting Concepts:**

Structure and Function

Influence of Science, Engineering, and Technology on Society and the Natural World

**Science and Engineering Practices:**

1. Asking Questions and Defining Problems

2. Developing and Using Models

6. Constructing Explanations and Defining Solutions

**Learning Standards**

**WA Arts State Grade Level Expectations**

*For the full description of each WA State Arts Grade Level Expectation, see:* [*http://www.k12.wa.us/Arts/Standards*](http://www.k12.wa.us/Arts/Standards)

1.1.1 Concepts: Character

1.2.1 Skills and Techniques: Movement/Stance, Gesture

1.4.1 Audience Skills

2.1.1 Creative Process

2.2.1 Performance Process

2.3.1 Responding Process

3.1.1 Communicates through the Arts

**National Core Arts Standards**

[*http://nationalartsstandards.org*](http://nationalartsstandards.org)

1. Generate and conceptualize artistic ideas and work.

2. Organize and develop artistic ideas and work.

3. Refine and complete artistic work.

4. Select, analyze, and interpret artistic work for presentation.

5. Develop and refine artistic techniques and work for presentation.

6. Convey meaning through the presentation of artistic work.

7. Perceive and analyze artistic work.

8. Interpret intent and meaning in artistic work.

9. Apply criteria to evaluate artistic work.

10. Synthesize and relate knowledge and personal experiences to make art.

11. Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.

**Early Learning Guidelines, if applicable**

*For a full description of Washington State Early Learning and Child Development Guidelines see:* [*http://www.del.wa.gov/development/guidelines/*](http://www.del.wa.gov/development/guidelines/)

(Age 4-5) 3. Touching, seeing, hearing, and moving around: Using the large muscles (gross motor skills).

(Age 4-5) 6. Learning about my world: Science: Ask questions and identify ways to find answers; try out these activities and think about what to do next to learn more. Arts: Understand that different art forms (such as drama) can be used to tell a story; show creativity and imagination; perform simple elements of drama; participate in dramatic play activities.

**Pre-Teach**

**ICON KEY:**

🗏 = Indicates note or reminder for teacher

🗹 = Embedded assessment points in the lesson

The Arts Foundations lessons of “Expressive Body” and “Tableau” should be taught before this infusion lesson.

Review the selected scientific concepts, if needed, before starting this lesson.

**Lesson Steps Outline**

**1.** Lead warm-up: Statues. Review the concepts of neutral and active

freeze (statue).

🗹 Criteria-based process assessment: Walks in neutral and freezes in a statue.

**2.** Demonstrate the concept of collaboration using the “Paper Copy” exercise. After demonstrating, lead students in the “Paper Copy” exercise.

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements.

**3.** Demonstrate how to build a model by “designing a statue” using a

student volunteer.

**4.** Lead students as collaborate in pairs “designing statues.” Assign a simple action for the entire class to work on. Guide the “molders” as they record the attributes of the statue they created.

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements. Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. Develops a simple sketch to illustrate the function of his/her model (statue).

**5.** Switch students so that the “molder” in step 4 becomes the statue for their partner. Repeat STEP 4.

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements. Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. Develops a simple sketch to illustrate the function of his/her model (statue).

**6.** Lead a group reflection that compares and contrasts the different designs created by the students.

🗹 Criteria-based teacher checklist, self and peer reflection: Presents his/her statue and justifies its specific attributes/features.

**LESSON STEPS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1. Lead warm-up: Statues. Review the concepts of neutral and active freeze (statue).**

* *In theater, we call movement without character added to it “neutral.” When you are acting as yourself, you are neutral. Walk around the room as yourself.*
* *As you walk around the room in neutral. I will shout out “Freeze!” Freeze wherever you are. I will then call out a character or a feeling. Turn your body into a statue of what I call out.*

🗹 Criteria-based process assessment: Walks in neutral and freezes in a statue.

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**2.** **Demonstrate the concept of collaboration using the “Paper Copy” exercise.**

🗏 Select a volunteer and have a page from a newspaper ready (blank newsprint paper is

also excellent).

* *We are going to start off with a theater game, but before we do, I would like to show you how it works. I need a volunteer.* (Volunteer is chosen.)
* *Now, the volunteer will be partner “A” and I will be partner “B.” Partner A, pick up that piece of newspaper and hold it by the top corners in front of you, but don’t cover your face.*
* *I will stand about two or three feet in front of Partner A and face him/her.*
* *Now, Partner A, slowly begin to move the paper, and I will “copy” the paper’s movement with my body.*
* *How can you make the paper move? You can fold it, swing it, drop it, crumple it up, etc.*
* *In order to make this activity work, you must “collaborate” with your partner. Who can tell me what collaborate means?*
* *Yes, it means to work with others to achieve a goal. In theater, actors must collaborate every time they perform with another actor.*

**After demonstrating,** **lead students in the “Paper Copy” exercise.**

🗏 Put students into pairs, with one student designated as “A” and the other as “B” (use other designators, if preferred, such as “Green” and “Yellow” or “1” and “2” etc.). Student “A” is given

the paper.

* *I would like all of the “A’s” to come up, take one piece of newspaper and return to your partner. Don’t do anything with the paper yet.*
* *Now, face your partner with about two or three feet between you. “A’s” hold the newspaper up in front of you, but don’t block your face.*
* *“A’s” begin to move the paper. “B’s” copy the paper’s movement with your body.*
* *A’s, don’t move the paper too fast, it should be slow enough for your partner to follow.*
* *B’s, move your body in a way that matches what you see the paper doing.*

🗏 Students will switch being the leader and follower. When switching, use a fresh piece of newspaper, if needed.

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements.

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**3. Demonstrate how to build a model by “designing a statue” using a student volunteer.**

🗏 Choose a simple action and show how a person’s body can be manipulated and articulated to demonstrate the attributes of that action.

* *Today, we are going to be dramatic scientists and build a model that represents a simple action. We are going to use a partner to make our model.*
* *With my volunteer and your help, I am going show how we can design a statue of a simple action. The action we are going to show is “climbing a ladder.”*

* *I am going to mold the volunteer’s body by moving his/her arms, legs, fingers, back, etc. around to show the action.*
* *Let’s start, raise your hand and tell me one thing that the volunteer’s body should be doing to show “climbing a ladder.”* (Solicit several ideas.)
* *Okay, first I am going to shape the volunteer’s hands to look like they are holding onto a rung of the ladder.*
* *Now, I’ll bend his knees, etc.*

🗏 Continue to use the students’ ideas to mold the volunteer’s body until it successfully demonstrates the attributes of “digging a hole.”

🗏 Alternatives to “molding” another student’s body by touching them:

* The “molding” of the student’s body can be verbally directed by the “molder.” Instead of physically moving the volunteer’s arm, for example, you could direct him by saying, “Move your right arm by bending your elbow and lifting your shoulder.”
* The “molding” can be accomplished by the “molder” holding his/her hands about five inches from his/her partner. The student being “molded” would follow the movements of the “molder’s” hands with the appropriate physical adjustments.

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**4.** **Lead students as they work in pairs “designing statues.”**

🗏 Give each student a Design Worksheet for recording her/his design. The worksheet is at the end of

the lesson.

* *Now, I want you to each pick up a worksheet, grab a pencil, and rejoin your partner. You will take turns being the “molder” and being the statue. Decide who is going first. You will each get a turn being the designer and the model.*

* *“Molder’s” remember that you should gently move your partner’s body. Also, tell them what you want them to do.*
* *“Statues” remember that you must cooperate with your partner and hold the positions they put you in.*
* *You are collaborating — a 21st Century Skill!*

**Assign the action of “throwing a ball” for the entire class to work on.**

* *The action you will use is the action of “throwing a ball”. What type of ball you are throwing is up to the “molder” of the statue. It could be a baseball, football, basketball, bowling ball, etc. The choice is yours.*
* *Be very specific that the positions that you are putting your statue in fit the type of ball your statue is throwing.*
* *You are now using “critical thinking” by making specific choices to reflect the function of “throwing a ball”.*

🗏 The amount of time spent “molding” should be closely monitored to avoid the student being “molded” from becoming restless and fidgety.

**Guide the “molders” as they record the attributes of the statue they created.**

* *Once you have finished designing your statue, draw a quick sketch on your worksheet. It doesn’t have to be perfect, but it should contain two or three specific details of what your statue is doing.*
* *Be sure to choose the best angle to make your sketch from. The drawing should show as much detail as possible. For example, it may be best to draw the statue from the side.*
* *After you make the sketch, write a few notes describing the details, such as, “My statue’s left arm is bent at the elbow.”*
* *You should be able to recreate your statue from the sketch and the notes you write down.*

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements. Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. Develops a simple sketch to illustrate the function of his/her model (statue).

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**5. Switch students so that the “molder” in step 4 becomes the statue for the partner. Repeat STEP 4.**

* *Now, switch jobs. The “molder” will be the statue and the statue will be the “molder.”*
* *You are going to create a statue of the same action of “throwing a ball” but with a different ball. If you used a baseball last time, maybe this time you can use a football. Your choice.*

🗹 Criteria-based teacher checklist: Follows the directions/physical cues of another student by copying his/her movements. Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. Develops a simple sketch to illustrate the function of his/her model (statue).

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**6. Lead a group reflection that compares and contrasts the different designs created by**

**the students.**

🗏 Have the duos pair up with another duo. Guide the students as they share out (in groups of four) their design choices and problem solving techniques.

* *Because there is always more than one possible solution to a problem, it is very useful to compare designs and learn from others.*
* *I want you to join up with another pair of students and take turns describing the design choices you made for your statue. ave your partner show the statue to your classmates and then, using your worksheet, describe and justify the design choices you made.*
* *As your justifying your choices, think of answering questions such as: Why did you position your partner’s hands the way you did? How does the position of your partner’s legs relate to the statue’s action or function?*
* *What are the similarities in your designs? How are they different?*
* *You are communicating — a 21st Century Skill!*

🗹 Criteria-based teacher checklist, self and peer reflection: Presents his/her statue and justifies its specific attributes/features.

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🗏 A POSSIBLE EXTENSION: After the students share their sketches and designs, they could use feedback from their peers to go back and re-design their statue to make it more specific/effective.

🗏 GRADE LEVEL ADAPTATIONS: For K – 2 classes, the creating of statues could be done as an entire class activity with the Teacher leading (as in the demonstrating steps above). A student volunteer could be used and the Teacher can solicit ideas from the class on how to mold the student. The student could hold the pose while the class makes a drawing of him/her. If students do mold one another, the activity should be kept fairly brief.

***Designing and Building Statues* Student Worksheet**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STATUE of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

SKETCH

**DETAIL #1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**DETAIL #2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**DETAIL #3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**ARTS IMPACT LESSON PLAN Arts Infusion**

*Designing and Building Statues*

🗏 Teachers may choose to use or adapt the following self-assessment tool.

**STUDENT SELF-ASSESSMENT WORKSHEET**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Disciplines | **THEATER & SCIENCE** | | **SCIENCE** | | Total  4 |
| Concept | Collaboration | Design/Engineering | **Design/**  **Engineering** | **Communication** |
| Criteria  Student Name | Follows the directions/physical cues of another student by copying his/her movements. | Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. | Develops a simple sketch to illustrate the function of his/her model (statue). | Presents his/her statue and justifies its specific attributes/features. |
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**ARTS IMPACT LESSON PLAN Arts Infusion**

*Designing and Building Statues*

**CLASS ASSESSMENT WORKSHEET**

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| Disciplines | **THEATER & SCIENCE** | | **SCIENCE** | | Total  4 |
| Concept | Collaboration | Design/Engineering | **Design/**  **Engineering** | **Communication** |
| Criteria  Student Name | Follows the directions/physical cues of another student by copying his/her movements. | Creates a statue of an action/science concept by manipulating the gestures, stance, and posture of another student to represent attributes of that action/concept. | Develops a simple sketch to illustrate the function of his/her model (statue). | Presents his/her statue and justifies its specific attributes/features. |
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*What was effective in the lesson? Why?*

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

*How could I connect the concepts in this lesson with other disciplines?*

Teacher: Date:

**ARTS IMPACT FAMILY LETTER**

THEATER & SCIENCE LESSON: ***Designing and Building Statues***

Dear Family:

Today your child participated in an **Arts and Science, Technology, Engineering** lesson. We talked about how we can design and create statues to represent scientific concepts and ideas.

* We discovered collaborated with a partner by both leading and following each other in a copying exercise.
* We created/engineered models out of our partners by molding and shaping their bodies into statues that represented specific actions and Science concepts.
* We sketched and described the attributes of our statue designs.
* We discussed and justified our design choice with our peers.

At home, you could practice molding each other’s bodies to make statues of ideas, characters,

words, etc.

**Enduring Understanding**

Identifying key attributes of a given problem can lead to the

engineering and designing of an effective model that represents that problem.