Basic Information

Designer(s)	Karen Keller
Title	Functional Flexibility in Sculpture
Summary	In this design challenge, students will use repurposed materials through functional flexibility to find creative solutions to visual design problems. This lesson combines the knowledge of cognitive psychology with design techniques applied to the visual arts to provide an understanding of how to stretch creative limits in visual expression.
Grade/Level	Grades 9-12
Time Frame	7 50-minute class sessions
Subject(s)	Visual Art
Modifications	 Class could do one collaborative sculpture Students could work collaboratively in groups Class could make one or more installation artworks Students could bring in their own materials to be used with teachers approval Students could paint or otherwise decorate the surface of the sculpture if they believe it would enhance their artwork.

Standards	Massachusetts Arts Curriculum Frameworks:	
	1.9 Demonstrate the ability to create 2D and 3D works that show	
	knowledge of unique characteristics of particular media,	
	materials, and tools.	

- **1.12** Describe and apply procedures to ensure safety and proper maintenance of the workspace, materials, and tools.
- **4.9** Demonstrate the ability to conceptualize, organize, and complete long-term projects, alone and in group settings.
 - Conceptualize: plan, generate ideas, make preliminary sketches, participate in discussions, imagine outcomes, and set goals.
 - Organize: choose materials and techniques to attain the desired look and feel; maintain work space and personal schedule; review progress of work with others; and revise work appropriately.
 - Complete: prepare work for presentation or exhibition.

CCO Visual Arts 9-12:

6 Students describe and analyze how visual artists use and have used materials, inventions, and technologies in their works.

21st Century Skills:

Flexibility and Adaptation: Adapting to varied roles and responsibilities and working effectively in a climate of ambiguity and changing priorities.

National Core Arts Standards:

VA:Cr1.2.lla Choose from a range of materials and methods of traditional and contemporary artistic practices to plan works of art and design.

Overarching Goal SMART

By the end of this lesson, students are able to describe the basic definition of functional fixedness and the skills to overcome it. Students also demonstrate *functional flexibility* through repurposed material use in their sculptures. This knowledge opens students minds to the possibility of expressing ideas creatively with new and unusual materials. With careful planning, sketching, and documentation, students can assess their own creative process and continually revise their artwork to be the best representations of their skills in this design challenge workshop. As

a transferrable skill, students can apply the skill of *functional flexibility* to solve real world problems using objects they encounter in everyday life.

*Understandi ngs and Lesson Objectives

Students will demonstrate the ability to create a 3D sculpture that shows knowledge of the *functionally flexible* characteristics of particular media, materials, and tools chosen among the repurposed materials provided. (MACF 1.9 & 21st Century Skills: Flexibility and Adaptation & National Core Arts Standards:VA:Cr1.2.IIa).

- I can use at least four repurposed materials in our group sculpture. (NCAS)
- I can identify and use the techniques for *functional flexibility* in my planning documents.
- I can make at least two transformations to the repurposed materials in my sculpture. (21st Century Skill)

Students will apply classroom procedures to ensure safety and proper maintenance of their individual workspaces, selected materials, and tools (MACF 1.12).

- I can use all materials, including scissors, the hot glue guns, and other potentially sharp materials safely as demonstrated by the teacher.
- I can properly put away materials on the shelf, with my name on both my cardboard sculpture stand and on my bag of selected materials, after each class session.

Students will conceptualize, organize, and complete their sculptures to be presented at the end of the lesson. (MACF 4.9 & 21st Century Skills: Flexibility and Adaptation).

- I can generate ideas for my sculpture through brainstorming in my process journal.
- I can make sketches to plan how my sculpture will look in my process journal.

	 I can revise my sculpture as needed with my process journal. (21st Century Skill) I can present my sculpture in class using my artist statement. Students will describe and analyze how visual artists use and have used functional fixedness in their works (CCO Visual Arts 9-12: 6). I can identify which of the three functional flexibility skills each artist from the PowerPoint used in their artmaking process. I can analyze how the selection of different materials informed the works of these artists. *Some objectives apply to multiple standards
Essential Questions	What is creativity?
Guiding Questions	 What is functional fixedness? How does it apply to my everyday life? To art? How can I be more functionally flexible? How will that affect my art?
Knowledge and Skills	 Knowledge: Basic understandings of psychology and bias (patterns of thought and behavior are influenced by nature and nurture) Skills: Functional Flexibility Building Upon: Discussion and brainstorming Sketching and planning Writing Gluing and taping Safe scissor use 3D design

Performance Tasks And Assessment

Performance Task/ Activity

The performance task for this lesson is to plan, sketch, design, and create a sculpture using at least four repurposed materials. For each repurposed material, students are challenged to transform and incorporate the item in at least two ways. There will be a presentation of each student's sculpture at the end of the lesson, where each student are instructed to explain their process using their artist statement, informed by their process journal. This will prepare students to find creative uses for materials they encounter in everyday life and for many problem solving situations. Through this lesson, students will also engage in the design process of planning, sketching, and revisions for a final presentation of their work.

Motivation

- Teacher will show students a quick video demonstrating a problem which is blocked by functional fixedness but solvable through creative material use.
- Teacher will present a PowerPoint discussing what functional fixedness and *functional flexibility* are through examples.
- Students will be motivated by examining the interesting artworks of Nicholas Gentry, Lisa Hoke, and Andy Goldsworthy.
- Practice Activity: Teacher will tell the students to brainstorm on a blank piece of paper in their packets as many different ways as they can think of to use a crayon and then go around sharing each groups ideas for using the crayon.
 - if students get stuck, refer to the methods from the PowerPoint
 - (some answers might include: writing, drawing, resist,
 rubbing on the side, melting to make candles, melting to

	dye soap, chopping up and gluing to a surface as decorations, waterproofing a surface, and building a pixelated image by stacking them).
Assessment/ Rubrics	 Rubric PowerPoint worksheet (which checks students understanding of the terms and artists methods for overcoming functional fixedness) Process Journal Artist Statement

Learning Experiences And Resources

	nes

- Before every class, the teacher will write the daily objectives on the board and have all necessary materials out on the back table for the work being done in that specific class.
- Teacher will greet class
- Students will take their seats.
- Teacher has rules and expectations created by the class on large posters in the room.
- The teacher will begin each lesson (but not class session) with an anticipatory set by using a presentation or a short demonstration along with questions and.
- Materials are in the back of the room or otherwise out of the way but accessible to students.
- Students raise hands to answer questions.
- The teacher will create an atmosphere that encourages students to ask questions by checking for understanding, posing thought provoking questions, and engaging individual students to contribute to the discussion.

- A few student helpers are occasionally assigned to pass out or collect supplies.
- Students will have a designated place for materials and process
- The teacher will use verbal warnings in intervals for transitions such as clean up, push in their chairs before they leave class.
- Students will make sure to write their names somewhere on their artworks and supply bags before they are collected at the end of each class session.
- Students are dismissed by the teacher when they have put away materials.

Instructional Approaches

Design Thinking

 The teacher will guide students as they work toward successful designs through applying problem-solving techniques. The teacher will create a design problem and assist the students in applying the design process through brainstorming, sketching, planning, designing, revising and presenting to peers.

Studio Based

• Teacher instructs students as they spend most of the lesson time working on their independent studio artworks within the constraints of the lesson. The teacher will demonstrate safe use of materials such as the hot glue gun and scissors, and give students individual guidance on how to construct their threedimensional assemblage sculptures. Much of the pedagogy is through the individual students' design processes in the studio setting.

Sequence of Activities

Day 1:

 Before the start of class, the teacher will have the PowerPoint and packets ready.

- The packets are composed of the Rubric, PowerPoint worksheet, process journal pages (with areas to both write and sketch) and a page for the students' artist statements. The packets are for the teacher to follow the students design process and assess their comprehension of the concepts and instructions.
- Students will file in and take their seats.
- Students will quiet down when the teacher greets the students and begins the lesson.
- Teacher will pass out the packets to each student, which includes the rubric, PowerPoint worksheet and process journal. They will then instruct students to turn to the second page with the PowerPoint worksheet and answer the questions as they begin introducing the lesson. (3 minutes)
- Teacher will start the anticipatory set with a PowerPoint Presentation including (20-30 minutes):
 - Functional Fixedness in action.
 - A definition of Functional Flexibility.
 - Techniques for Functional Flexibility.
 - Artists who are functionally flexible in repurposed material use.
 - A brief description of the students upcoming performance task.
- Teacher will count off to break students into groups of three and instruct the students to sit with their group partners. (2 minutes)
- The teacher will then give a crayon to each group.
- Teacher will tell the students to brainstorm on a blank piece of paper in their packets as many different ways to use a crayon as they can think of. (15-20 minutes)
 - if students get stuck, refer to the methods from the PowerPoint.

- (some answers might include: writing, drawing, resist, rubbing on the side, melting to make candles, melting to dye soap, chopping up and gluing to a surface as decorations, waterproofing a surface, and building a pixelated image by stacking them).
- Students from all groups will then go around sharing their ideas as the teacher writes them on the board.
- Teacher will go over the requirements in the rubric by having students take turns reading the objectives as the teacher shows an exemplar which exhibits each requirement completed to a satisfactory level for the upcoming artistic activity
- Teacher will introduce a list of available materials in the classroom and a reminder that bringing in something different could earn extra credit. Teacher will take questions, then allow students to start planning in their process journals. (10-15 minutes)
- Teacher will give 5 minute warning.
- Teacher will ask students to leave their process journals at their spots on the tables for collection at the end of each class.
- Teacher will collect students process journals before they leave class every day.
- Students will file out at the end of class.

Day 2:

- Before the start of class, the teacher will have all of the found object materials in bins in the back of the classroom, or otherwise out of the way of foot-traffic. Along with the repurposed items will be the scissors, tape, string, and (on a safe surface) a hot glue gun and a bin of glue gun sticks
- Students will file in and take their seats.

- Students will quiet down when the teacher greets the students and begins the lesson.
- As teacher passes out process journals (which acts as attendance as well) the teacher will review the topics discussed last class with some review questions.
- Teacher will direct the class's attention to the back of the room with the bins and go over the selection of repurposed items they have at their disposal.
- Teacher will remind students that they could receive extra credit for bringing in their own approved repurposed item. (5-7 minutes)
- Teacher will warn students of the dangers of the hot glue gun and give a quick demonstration of how to safely use it to avoid burns or fire hazards. (2 minutes)
- Teacher will explain that today, students may explore the different items to discover potentially useful or aesthetically pleasing qualities which could be used in their final sculptures. Teacher will add that they are required to make at least one sketch in their process journal before beginning the building of their sculptures.
- Teacher will give the class more time for process journal sketches, notes, and further questions. Students are encouraged to sample and explore the various items to discover their potential transformative uses in their sculptures.
- Teacher will walk around and ask students how they are doing and what ideas they have. Teacher will help individual students work through their creative process to select items and generate ideas. Teacher will give approval to students who have completed sufficient sketches to move on to selecting materials (30 minutes)
- While students are sketching and planning, teacher will give each student a plastic shopping bag and a 12"x12" piece of cardboard, as well as some sharpies.

- Teacher will announce to class a 5 minute warning and explain
 that they will each be building their sculptures on the cardboard
 given to them and any items that are claimed but not attached yet
 will go in their shopping bag. At the end of each class, the
 shopping bag and sculpture in progress on the cardboard will be
 placed on the shelf.
- Teacher instructs students to put their names on the corners of their cardboard pieces and on their bags. If any students have already selected items, they may go in their bags.
- Teacher will instruct students to leave process journals on the tables at their spots.
- Students will clean up accordingly and file out at the end of class.
 (5-7 minutes).
- Teacher will collect process journals from tables.

Days 3-5:

- Before the start of class, the teacher will have all of the found object materials in bins in the back of the classroom, or otherwise out of the way of foot-traffic. Along with the repurposed items will be the scissors, tape, string, and (on a safe surface) a hot glue gun and a bin of glue gun sticks
- Students will file in and take their seats.
- Students will quiet down when the teacher greets the students and begins the lesson. (3 minutes)
- As teacher passes out process journals (which acts as attendance) the teacher will review the topics discussed last class with some review questions.
- Teacher will call tables to get their items from the shelves.
- Students will continue work on their sculptures as the teacher assists students one by one and monitors safe and respectful material use. Teacher will answer questions and give

- demonstrations of various improvisational techniques as needed for students to effectively cut, glue, tape or otherwise attach items to their individual sculptures. (40 minutes)
- Teacher will remind students to continue documenting their process, revisions, questions, ideas and sketches in their process journal as they work.
- Teacher will give general reminders of the due date and how much class time they have left as each studio work day goes by.
- Teacher will give five minute warning.
- Teacher will instruct students to leave process journals on the tables at their spots.
- Students will clean up accordingly and file out at the end of class.
 (5-7 minutes).
- Teacher will collect process journals from tables.

Day 6:

- Before the start of class, the teacher will have all of the found object materials in bins in the back of the classroom, or otherwise out of the way of foot-traffic. Along with the repurposed items will be the scissors, tape, string, and (on a safe surface) a hot glue gun and a bin of glue gun sticks
- Students will file in and take their seats.
- Students will quiet down when the teacher greets the students and begins the lesson. (3 minutes)
- As teacher passes out process journals (which acts as attendance) the teacher will review the topics discussed last class with some review questions.
- The teacher will explain that this is the last day to work on the sculptures and is also the time they have in class to write their brief artist statements using the notes and sketches they have in their process journals.

- Teacher will call tables to get their items from the shelves.
- Students will finish work on their sculptures as the teacher assists students one by one and monitors safe and respectful material use. Teacher will answer questions and give demonstrations of various improvisational techniques as needed for students to effectively cut, glue, tape or otherwise attach items to their individual sculptures. (20 minutes)
- Teacher will remind students to write their artist statements for their presentations of their works next class. (25 minutes).
- Teacher will give a five minute warning and say any work left on the artist statement may be completed outside of class before the next class day when they present their works.
- Teacher will instruct students to leave process journals on the tables at their spots if they are done with the artist statements.
- Students will clean up accordingly and file out at the end of class.
 (5-7 minutes).

Day 7:

- Students will file in and take their seats.
- Students will quiet down when the teacher greets the students and begins the lesson.
- As teacher passes out process journals, or instructs those who
 took theirs home to finish to take them out, (which acts as
 attendance) the teacher will review the topics discussed last class
 with some review questions. (3 minutes)
- Teacher will have each student come up to the front and share their work and artist's statements. The teacher will facilitate discussion about the presented piece and questions regarding the students process. (2-4 minutes each).

- Teacher will wrap up the lesson with a discussion of how students can use these skills going forward and what their thoughts were on the activity. (5 minutes)
- Teacher will ask students to put away their process journals with their finished pieces on the shelves to be graded together.
- Class will be dismissed and students will file out.

Instruction and Adaptations

General Practices

- Speak slowly and clearly, and wait at least 10 seconds after posing a question for all students to understand what is said and formulate a response.
- Instruction and essential information should be provided in written form as well as repeated orally, demonstrated, and in visuals.

Students with Limited Mobility and/or Fine Motor Needs

- Students can use adaptive scissors for cutting and substitute materials to fit their needs (as this project is inherently flexible).
- Modified drawing materials should be made available for sketching and process journal work.
- Make classroom accessible for wheelchair users by having 32 inches minimum width for all traffic areas
- Have work area and/or table(s) adjusted to a height for wheelchair users
- Students with limited mobility should be seated as close to exit/door as possible for ease and speed of entry and exiting.

ELLs

- Provide visuals (images, photos, actions etc.) to accompany new terms and vocabulary on the board/walls/handouts/PowerPoint.
- Rephrase student answers as needed.
- Pair students with Native speakers.
- Provide English-to-English dictionaries for students.
- Elaborate and define English terms with English definitions.

Students that are Hard of Hearing or Deaf

- Teacher should have these students sit as close as possible to the teacher, facing them at all times.
- Video content should include closed-captioning.
- Check with students that they can hear the audio from all areas of the room.

Students with Limited Visibility or Blindness:

- Video and other visual content will be explained orally.
- Large print versions of handouts and printed content should be made available for students with low and partial vision.

Students with ADHD/ADD:

- Instruct students to use doodling to keep themselves focused during lecture portions of lessons.
- Seat students close to the front of the classroom and away from distractions (windows, doors, hallways, etc.)
- Redirect students, as needed, to keep them on-task.
- Allow students to take brief breaks and walk around classroom when needed.

Students with Autism or on the Autism Spectrum:

- When there will be a change in routines, students should be informed in advance of that class/date.
- Allow students to take breaks as needed.
- Provide students with opportunities to collaborate with others and work in groups to encourage social development.

Advanced Learners and Early Finishers:

- Teacher instructs students to work on additional details to further develop their artwork.
- Teacher can allow students to read classroom art books when finished with the original assignment.

	Teacher can also instruct students to assist the teacher or help other students if they are done early.
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Materials

- 15 Sharpie markers
- 25 12"x12" pieces of cardboard
- 25 Plastic shopping bags
- 2-3 Hot glue guns
- 100 Glue gun sticks
- 25 Scissors
- 15 Scotch Tapes
- *Classroom set acrylic paints
- *Classroom set paint brushes
- 4 rolls of string
- Various found objects (that are both sanitary and safe with minimal supervision) in bulk (75+) such as:
 - Egg cartons
 - Water bottles
 - Slinkys
 - Scrunchies
 - Plastic utensils
 - Paper clips
 - Clothes pins

	o Old CDs
	o Cassettes
	 Spare board game pieces
	o Sponges
	 Old clothes
	o Rocks
	o Seashells
	*optional
Key Words	
Vocabulary	can often be misleading or false.
	Functional Fixedness: a cognitive bias which causes one to
	perceive objects as only being able to serve the purpose for
	which they are designed
	Functional Flexibility: the overcoming of functional fixedness
	Frames (of Reference): the "lens" or perspective through which
	a person sees something. It can color or even skew a person's
	understanding of something.
	Deconstruction: to take something apart to reveal the individual parts and their mechanisms.
	Assemblage: a sculpture made from an amalgamation of found
	materials.
	Design: The process of using creative means to plan, sketch,
	revise and create a successful and/or functional work of art.
Appendices	"The Overcoming of Functional Fixedness as Applied to Visual
	Arts Education" (literature review for further clarification of
	functional fixedness in relation to the visual arts and education)
	PowerPoint "Functional Fixedness and Functional Flexibility in
	Artmaking"
	Student packet including:

- o Rubric
- PowerPoint Worksheet
- o Process Journal
- https://www.youtube.com/watch?v=gaI7N6J3rAc