

Renewable Energy Sculpture

Lesson Overview: Inspired by Patrice Stellest, and other contemporary artists, students create renewable energy sculptures to promote alternative energy sources.

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Subject(s): Visual Arts, Science, Social Studies, Technology

Suggested Grade Level(s): 7 - 12

Time Duration: Ten 40-45 minute class periods

Common Core State Standards Addressed:

National Core Standards for the Visual Arts

Visual Arts/Creating #VA:Cr3.1

Process Component: Section 6

Anchor Standard: Refine and complete artistic work.

Enduring Understanding: Artist and designers develop excellence through practice and constructive critique, reflecting on, revising, and refining work overtime.

Visual Arts/Responding #VA:Re8.1

Process Component: Section 11

Anchor Standard: Interpret intent and meaning in artistic work.

Enduring Understanding: People gain insights into meanings of artworks by engaging in the process of art criticism.

Visual Arts/Connecting #VA:Cn10.1

Process Component: Section 13

Anchor Standard: Synthesize and relate knowledge and personal experiences to make art.

Enduring Understanding: Through art-making, people make meaning by investigating and developing awareness of perceptions, knowledge, and experiences.

Visual Arts/Connecting #VA:Cn11.1

Process Component: Section 14

Anchor Standard: Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.

Illinois State Standards for the Visual Arts

State Goal 25: Know the Language of the Arts

a. Understand the sensory elements, organizational principles, and expressive qualities of the arts.

b. Understand the similarities, distinctions, and connections in and among the arts.

Center for International Studies – Energy and the Global Environment: Science, History, Politics, University of Chicago, 2014.

<http://cis.uchicago.edu/>

State Goal 26: Through creating and performing, understand how works of art are produced.

- a. Understand processes, traditional tools and modern technologies used in the arts.
- b. Apply skills and knowledge necessary to create and perform in one or more of the arts.

State Goal 27: Understand the role of the arts in civilizations past and present.

- a. Analyze how the arts function in history, society, and everyday life.
- b. Understand how the arts shape and reflect history, society and everyday life.

Objectives:

- Students will examine the environmental art movement, specifically focusing on the design and construction of renewable energy sculptures.
- Students will investigate wind, water, solar, and muscle-power as means of powering a visually dynamic artwork that aesthetically emits sound, movement and/or light.
- Students will examine the practice and artwork of renewable energy artists.
- Students will interpret a selection from an environmental science book, and construct a persuasive story to caution readers about reliance on non-renewable energy sources.
- Students will design, construct, and curate an art exhibition that inspires the use of renewable energies for application in homes, offices, and public spaces.

Materials

- Bailleul-LeSuer, Rozenn. "Energy Resources and Uses in the Ancient World. Ancient Egypt as a Case Study." *Academia.edu*. Web. 2 Dec. 2014. <http://www.academia.edu/8603745/Energy_Resources_and_Uses_in_the_Ancient_World._Ancient_Egypt_as_a_Case_Study>.
- *Center for Robust Decision Making on Climate and Energy Policy*. Web. 2 Dec. 2014. <<http://www.rdcep.org>>.
- "Energy Consumption: The USA vs. Other Countries." *YouTube*. YouTube. Web. 2 Dec. 2014. <<https://www.youtube.com/watch?v=rWOKLyWz0zo>>.
- "Full Text of "Silent Spring-Rachel Carson-1962"" *Full Text of "Silent Spring-Rachel Carson-1962"* Web. 2 Dec. 2014. <https://archive.org/stream/fp_Silent_Spring-Rachel_Carson-1962/Silent_Spring-Rachel_Carson-1962_djvu.txt>.
- "Power to the Plug." *Energy.gov*. Web. 2 Dec. 2014. <http://www1.eere.energy.gov/education/pdfs/power_to_the_plug.pdf>.
- "STELLEST - Official Site." *STELLEST - Official Site*. Web. 2 Dec. 2014. <<http://www.stellest.com/>>.
- "The Art Gallery of Renewable Energy." *The Art Gallery of Renewable Energy*. Web. 2 Dec. 2014. <<http://www.lope.ca/artrenewable/>>.

- Found objects
- Outdoor solar lights (inexpensive stake lights can be purchased at a hardware store)
- Solar panels (inexpensive, small scale)
- Tubing (plastic, rubber, aluminum)
- PVC pipes (assorted sizes)
- Balsa wood
- Dowel rods
- Cardboard
- Tiles (cork, ceramic)
- Glass
- Batteries
- Nails, screws, etc.
- Adhesives
- String
- Wire
- Building tools
- Paint
- Brushes
- Paint/water containers
- Pencils/pens/markers
- Internet access
- Journals/sketchbooks

Reference artists: Kinetic artists, such as Alexander Calder, Jean Tinguely, Marcel Duchamp. Light installation artists such as Dan Flavin, Félix González-Torres, Bruce Nauman, Jenny Holzer. Sound artists, such as Jim Green.

Activities and Procedures:

1) Begin by having students view Energy Consumption: The USA vs. Other Countries." *YouTube*. YouTube, n.d. Web. 15 Sept. 2014

(<https://www.youtube.com/watch?v=rWOKLyWz0zo>). Ask the students to consider how art might be used to promote the use of renewable energies. Follow with a presentation of artist Patrice Stellest at stellest.com. Students may explore individually online, or use a projector. While viewing the Stellest website, have students answer the following questions in their journals: What is Trans Nature Art (TNA)? Name 3 examples of objects found in Stellest's studio. Describe 3 events in Stellest's life that were key factors in the development of his art-making practice and his overall philosophy. Describe Stellest's sculpture entitled "Solar Head," and its significance. Then distribute and discuss the project guidelines.

Homework: Read "Power to the Plug" handout

(http://www1.eere.energy.gov/education/pdfs/power_to_the_plug.pdf), and complete the survey included in the packet. Begin searching for found objects to use in your sculpture and to also contribute to the class found object pool. Bring at least 3 objects to the next class.

2. After checking the students' found objects, ask them to label those that they plan to retain for their own sculptures, and then have them place all objects in the designated storage space for future use. Divide the students into small groups to discuss the results of their surveys, and ask them to focus on observable trends. After 5 - 6 minutes, ask each group to share their observations. In his/her journal, ask each student to formulate a statement regarding his/her perception of the level of energy consumption awareness that exists within the community. Then ask each group to research renewable energy sources by viewing the websites listed on the guideline sheet. Have the students divide the research work by exploring individual areas of interest. Provide time (at least 10 minutes) at the end of the period for students to exchange information.

Note: Teachers in the Chicago area can contact the Center for Robust Decision Making on Climate and Energy Policy (CDCEP) at rdcep.org to borrow an energy demo kit for their classrooms for a hands-on activity. If the energy demo kit is available, assign the web research as homework.

Homework: In your journal, sketch 2 ideas for a renewable energy sculpture made out of found objects. Annotate each sketch to clearly explain how the artwork operates based on a renewable energy source. Keep in mind the following Principle of Design: Form follows function.

3. Divide the class into small groups based on the renewable energy source that each student has designated as an energy source in his/her idea sketches (wind, water, solar, muscle). In small group discussions have the students share their designs and research. Since the students' sketches may reference more than one energy source, allow time for students to meet with more than one group. Then, with feedback from peers, ask each student to create a proposal for his/her sculpture. The proposal should include a sketch from at least two vantage points. All sketches should be annotated to clarify found objects and materials that will be used for construction, and should explain how the sculpture will operate. Each proposal should also include a paragraph explaining how the sculpture encourages the use of the selected renewable energy source. For the last 10 minutes of class, have the students return to their small groups for feedback on their proposals. Ask them to comment on feasibility, in terms of time and materials; originality; and the overall aesthetics of the piece.

Note: During the proposal designing stage it would be helpful to allow students access to the found objects, and the demo kit from CDCEP.

Homework: Further research the renewable energy source that you are using to power your sculpture. In your journal, document your findings, and note specifics that relate to your sculpture. Use this information as you finalize your proposal, which is due at the beginning of the next class. Search for additional found objects as needed.

4. Collect proposals for review. Then assign each small group the task of researching a specific contemporary renewable energy artist or an artist of the past who created an artwork with a component that is powered by a renewable energy source. Ask students to review the group research requirements as listed in the project guidelines. The remainder of the class should be used for research and planning.

Homework: Read: Chapter 1, and the first paragraph of Chapter 2, of Rachel Carson's

Silent Spring (https://archive.org/stream/fp_Silent_Spring-Rachel_Carson-1962/Silent_Spring-Rachel_Carson-1962_djvu.txt). In your journal, write a reflection based on the following prompt: *Silent Spring* centers on Carson's concern for the indiscriminant use of pesticides over 50 years ago. It is considered one of the most important books of the 20th century as it ignited the environmental movement. In your journal, discuss how the first paragraph of Chapter 2, "The Obligation to Endure," might be used as an argument for encouraging widespread use of renewable energies. Cite 3 specific points. Also, continue working on your small group research project.

5. Return proposals with comments and suggestions, as needed. Have the students revise proposals if necessary, and/or begin the construction process.

Homework: Using Carson's *Silent Spring* as inspiration, write a story describing what might be the future fate of your community if non-renewable energy sources are depleted, and there has been a lack of investment in renewable energies. Also, finish your small group research project.

6. Depending on the number of small groups, begin with two or more of the small group research presentations (allot 6 minutes per group). **Require students to enter at least 5 important points about the artist and his/her work in their journals.** Then have students continue construction of their individual sculptures for the remainder of the class period. Homework: Read: "Energy Resources and Uses in the Ancient World. Ancient Egypt as a Case Study." Choose one of the images of an ancient artwork included in the presentation, and describe the visual evidence of the ancients' use of a specific form of energy.

7. Begin class with two or more of the small group presentation(s). Require students to enter at least 5 important points about the artist and his/her work in their journals. Then divide the students into pairs in order to silently peer reviewer each other's progress in the construction process. After compiling a list of questions, recommendations, and/or other feedback, students should discuss their findings. Using the feedback from their peers, students should make adjustments while continuing in the construction process. Homework: Draft the didactic for your sculpture.

8. Begin class with two or more of the small group presentation(s). Require students to enter at least 5 important points about the artist and his/her work in their journals. Continue construction process. Remind students that they will be testing their sculptures during the next class, and making only small adjustments if necessary. Provide time for students to exchange didactic drafts for peer review. Homework: Finalize your didactic.

9. Begin class with two or more of the small group presentation(s). Require students to enter at least 5 important points about the artist and his/her work in their journals. Then have the students test their renewable energy sculptures and make adjustments accordingly. Homework: Review all journal entries for this project in preparation for assessment.

10. Peer and self-assessments, and final assessment (tools attached). Then have the class develop a proposal for installation on a pre-determined site to be reviewed by administrators, building engineer, etc. Once permission is granted for the site, oversee students' installation, and have students collect feedback from school/community members.

Assessments:

- Peer, self, and final assessments attached.

Adaptations:

Although this project centers on students creating individual art pieces, the same format could be used to have the students design and construct collaborative pieces.

Extra Credit/Additional Resources:

For additional reading and other resource materials visit:
<http://cis.uchicago.edu/outreach/summerinstitute/2014/resources.shtml>

RENEWABLE ENERGY SCULPTURE

CONSIDER:

*I have seen what can happen when people discover they have the power to make their world.
They move from consumer to producer, shifting from passive to active.
They become designer, capable of engaging the world, questioning and challenging,
and imagining possibilities.*

Bruce Mau, Designer, From p. 42 of *CAD Monkeys, Dinosaur Babies, and T-shaped People*

YOUR INDIVIDUAL ASSIGNMENT

The class will create a renewable energy art exhibition that will be installed on the school premises. The purpose of the exhibit will be to encourage viewers to consider renewable energy sources as an alternative to those that threaten the environment and/or are unsustainable. As one of the exhibiting artists, you must propose, design, and construct a sculpture for display that emits sound, light, and/or movement through a renewable energy source. The component(s) may be powered by wind, water, solar, and/or muscle power. The design process will include a proposal; and as an exhibiting artist you will be required to construct and install your sculpture, and to provide contextual information to accompany it.

YOUR GROUP ASSIGNMENT

As a member of a group you must research a contemporary renewable energy artist or an artist of the past who used a renewable energy source to power a specific component in an artwork. As a team, your group will create a PowerPoint presentation that will inform the class about the artist, and his/her practice.

YOUR RESPONSIBILITIES

Read all assigned articles and excerpts; write responses to journal prompts; actively participate in class/group discussions and studio work; and provide honest and helpful feedback to your peers. You are also expected to come to class prepared, and to stay on task throughout the entire class period; to meet all deadlines; and to complete all assignments and homework.

PROPOSAL REQUIREMENTS

- Written description, including overall dimensions and site orientation (minimum of one paragraph).
- Annotated sketches from two vantage points.
- Materials list.

RENEWABLE ENERGY SCULPTURE REQUIREMENTS

- Recycled materials – Constructed out of discarded materials, and/or repurposed objects.
- Must emit sound, light, or movement powered by a renewable energy source, such as wind, muscle, water, or solar.
- Safe and visually dynamic.
- Installation plan – Annotated sketch and description of on-site specifications.
- Didactic – Written description and suggestions for how the renewable energy source illustrated in the sculpture could be used for applications in homes, offices, and/or public spaces.

GROUP RESEARCH PRESENTATION REQUIREMENTS

- PowerPoint with images of artist's work, brief description of artist and his/her works, and bibliography with all sources cited.
- Three-minute oral presentation in which all members of the group participate.
- Engagement of other class members in a 3-minute discussion.
- All group members must participate at an equal level. However, groups may divide research, visual presentation, written contributions, and speaking time according to format that will enhance the overall presentation.

TIMELINE

Day 1 –Class Activities: Viewing and discussion of Energy Consumption: The USA vs. Other Countries," and stellet.com. Journal entry: Answer the following questions - What is Trans Nature Art (TNA)? Name 3 examples of objects found in Stellet's studio. Describe 3 events in Stellet's life that were key factors in the development of his art-making practice and his overall philosophy. Describe Stellet's sculpture entitled "Solar Head," and its significance. Discussion of project guidelines.

Homework: Read "Power to the Plug" handout, and complete the survey included in the packet. Begin searching for found objects to use in your sculpture and to also contribute to the class found object pool. Bring at least 3 objects to the next class.

Day 2 –Collection of found objects. Small group and class activity: Sharing of survey results. Journal entry: Write a statement that describes your perception of your community's level of awareness in respect to energy consumption. Small group activity: Research renewable energy sources and share information, and/or energy demo kit hands-on activities.

Homework: In your journal, sketch 2 ideas for a renewable energy sculpture made out of found objects. Annotate each sketch to clearly explain how the artwork operates based on a renewable energy source. Keep in mind the following Principle of Design: Form follows function. Also, continue research.

Day 3 – Small group activity: Discussion of idea sketches and research based on energy source (wind, water, solar, muscle. Studio: Development of individual proposals for sculpture (see proposal requirements). Peer review of proposals for feasibility; originality; and the overall aesthetics.

Homework: Further research the renewable energy source that you are using to power your sculpture. In your journal, document your findings, and note specifics that relate to your sculpture. Use this information as you finalize your proposal, which is due at the beginning of the next class. Search for additional found objects as needed.

Day 4 – Collection of proposals for instructor's review. Small group activity: Begin research on a contemporary renewable energy artist or an artist of the past who created an artwork with a component that is powered by a renewable energy source (see group research presentation requirements).

Homework: Read: Chapter 1, and the first paragraph of Chapter 2, of Rachel Carson's *Silent Spring*. In your journal, write a reflection based on the following prompt: *Silent Spring* centers on Carson's concern for the indiscriminant use of pesticides over 50 years ago. It is considered one of the most important books of the 20th century as it ignited the environmental movement. In your journal, discuss how the first paragraph of Chapter 2, "The Obligation to Endure," might be used as an argument for encouraging widespread use of renewable energies. Cite 3 specific points. Also, continue working on your small group research project.

Day 5 – Studio: Revision of proposals as needed, and construction of sculptures.

Homework: Using Carson's *Silent Spring* as inspiration, write a story describing what might be the future fate of your community if non-renewable energy sources are depleted and there has been a lack of investment in renewable energies. Also, finish your small group research project.

Day 6 – Class activity: Begin small group research presentations - 6 minutes per group. Journal entry: Documentation of 5 interesting points for each artist and artwork presented. Studio: Continue construction of sculptures.

Homework: Read: "Energy Resources and Uses in the Ancient World. Ancient Egypt as a Case Study." Choose one of the images of an ancient artwork included in the presentation, and describe the visual evidence of the ancients' use of a specific form of energy.

Day 7 – Class activity: Small group research presentations - 6 minutes per group. Journal entry: Documentation of 5 interesting points for each artist and artwork presented. Peer review: Provide peer with a list of questions and recommendations based on current status of his/her sculpture. Studio: Continue in the construction process.

Homework: Draft the didactic for your sculpture.

Day 8 – Class activity: Small group research presentations - 6 minutes per group. Journal entry: Documentation of 5 interesting points for each artist and artwork presented. Studio: Final day for construction of sculptures. Peer review: Exchange of didactics to check clarity, spelling and grammar. Homework: Finalize your didactic.

Day 9 – Studio: Testing of all sculptures with time provided for making adjustments. Homework: Review all journal entries for this project in preparation for assessment.

Day 10 – Peer and self-assessments, and final assessment. Class activity: Development of a proposal for installation of sculptures in a space within or outside of the school to be reviewed by administrators, building engineer, etc. Once proposal has been approved an installation date will be determined.

GRADING CRITERIA

- ❖ Your sculpture is soundly crafted out of found materials, is safe and visually engaging, and effectively emits sound, light and/or movement.
- ❖ Your sculpture includes a didactic without spelling/grammar, and the didactic effectively encourages the use of a renewable energy source.
- ❖ Your proposal for your sculpture met all requirements.
- ❖ Completeness of all homework and in-class journal entries.
- ❖ Your group's research presentation met all requirements.
- ❖ Evidence of individual contributions that enhanced your group's research project.
- ❖ Evidence of your responsible participation in the collaborative installation of the exhibit.

ADDITIONAL GRADING CRITERIA

- ❖ Meeting all deadlines.
- ❖ Attendance and prompt arrival to class.
- ❖ Active and productive participation in all class activities.
- ❖ Thoughtful participation in small group/class discussions and peer reviews.
- ❖ Responsible care/cleanup of tools, materials, equipment, and workspace.

ENERGY VIDEOS & ONLINE RESOURCES

Energy –

https://www.youtube.com/watch?v=20Vb6hILQSQ&list=PL_iJfQsG3lq1zm0NB0NRJ2M5LvFp04_r
<http://www.need.org/files/curriculum/infobook/EfficiencyS.pdf>
file://localhost/<http://www.academia.edu/Documents/in/Ancient_Technology_Archaeology_

Muscle – http://cis.uchicago.edu/outreach/summerinstitute/2014/documents/bailleul-lesuer/sti2014_the-pre-industrial-sources-of-power_-muscle-power_-history-today.pdf.

Solar – <https://www.youtube.com/watch?v=NDZzA1cCQLQ>
<http://www.need.org/files/curriculum/infobook/SolarS.pdf>

Water (Hydropower) – <https://www.youtube.com/watch?v=tpigNNTQix8>
<http://www.need.org/files/curriculum/infobook/HydroS.pdf>

Wind – https://www.youtube.com/watch?v=niZ_cvu9Fts
<http://www.need.org/files/curriculum/infobook/WindS.pdf>

Rachel Carson's *Silent Spring* –

https://archive.org/stream/fp_Silent_Spring-Rachel_Carson-1962/Silent_Spring-Rachel_Carson-1962_djvu.txt

Renewable Energy Artists – <http://www.lope.ca/artrenewable/>

Name _____ Per. _____ Date _____ Self-Assessment Score _____

RENEWABLE ENERGY SCULPTURE

Score your proposal, sculpture, and group research presentation according to the following scale: 0 – 5 pts. (This section is worth up to 50 pts.)

_____ My proposal included: 1) a well-thought out written description, without spelling/grammar errors; 2) estimated dimensions for my sculpture; 3) directions for site orientation; 4) two neatly drawn and annotated sketches from different vantage points; and 5) a materials list.

_____ My sculpture is safe, soundly crafted out of found materials, and creatively emits one or more of the following (circle all that apply):

 sound light movement

_____ My sculpture is a visually dynamic example of the following renewable energy source (circle all that apply):

 wind muscle water solar

_____ The didactic for my sculpture is without spelling/grammar errors, and provides viable suggestions for how the renewable energy source used to power my sculpture might be used in a home, office or public space.

_____ My contributions to my group's research project helped make our presentation clear, engaging, and informative. On the line below, write the name of the artist that your group presented:

_____ I met all deadlines, and completed all reading assignments and journal entries.

_____ I did not have any unexcused absences or unexcused tardies.

_____ I actively participated in all class activities, and I was productive throughout.

_____ I enthusiastically participated and readily shared my ideas in all class and group discussions, and I provided meaningful feedback to my peers, and used their feedback along with my instructor's to improve my individual work and my collaborative work.

_____ I took excellent care of all tools, materials, equipment, and workspace, and I actively participated in all cleanup activities.

In the space below, describe your individual contributions to your small group research presentation:

Name _____ Per. _____ Date _____ Peer-Assessment Score _____

Identify your sculpture by providing its title, and a brief description:

Peer Reviewer's Name (must be from another group): _____

Score your peer's sculpture and group presentation according to the following scale: 0 – 10 pts. (This section is worth up to 40 pts.)

_____ The sculpture is safe, soundly crafted out of found materials, and creatively emits one or more of the following (circle all that apply):

 sound light movement

_____ The sculpture is a visually dynamic example of the following renewable energy source (circle all that apply):

 wind muscle water solar

_____ The sculpture has an accompanying didactic, without spelling/grammar errors. It suggests viable applications for use of the renewable energy source in homes, offices, or public spaces.

_____ My peer's small group presentation was clear, engaging, and informative.

Teammate Reviewer's Name (must be from same small research group as student being assessed):

Score your peer's participation in planning and developing your small group's research and presentation according to the following scale: 0 – 10 pts. (This section is worth up to 10 pts.) Circle the best description of his/her participation and overall contributions.

- 0 – Did not participate or contribute.
- 2 – Very little in participation/contributions.
- 4 – Occasional participation/contributions.
- 6 – Adequate participation/contributions.
- 8 – Almost always participated and contributed.
- 10 – Outstanding participation and contributions.

Instructor's adjustments _____

Total Score _____

Comments:

Name _____ Per. _____ Date _____ Total Score _____

RENEWABLE ENERGY SCULPTURE: FINAL ASSESSMENT

1) Describe the difference between renewable and non-renewable energies. Use specific examples of each in your discussion, which must be at least one full paragraph. (0 – 20 pts.)

2) Describe Patrice Stellest's Trans Nature Art (TNA), and discuss how his early life in Switzerland and Katchina, Arizona influenced the development of TNA. (0 – 20 pts.)

3) Cite a specific energy source used by the ancient Egyptians to perform a specific function. Provide evidence of its use by describing visual evidence that exists in a surviving ancient artwork. Include a sketch. (0 – 20 pts.)

4) Discuss the concept and purpose of renewable energy art by citing the work of one of the artists whose work was presented in class by a team of your classmates. Do not use the work of the artist that your group researched. (0 – 20 pts.)

5) Describe in at least one paragraph the renewable energy sculpture created by one of your classmates, and discuss how his/her sculpture inspires the use of a renewable energy source in both form and function. Include an annotated sketch of the sculpture. (0 – 20 pts.)

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