Activity

CREATIVE STATEMENT AND PROCESS REFLECTION

land art generator initiative **powered by art!**

TOOLS

- Writing materials
- Dictionary
- Thesaurus
- Calculator

DESCRIPTION

Students reflect on the experience of designing their own "land art generators" and create a list of tips for future designers. Students then create their own creative statements, and calculate the energy output of their generators. This is followed by an open work and documentation session.

GOALS

1. Reflect on the design process and workshop experience
2. Articulate aesthetic concepts
3. Demonstrate a link between language and design
4. Calculate energy output figures for generator designs

TIME TO COMPLETE ACTIVITY

60 minutes

By the time you reach this activity, you and your team will have worked through much of the design process. You will have read and understood the Design Brief, brainstormed some creative ideas, sketched your ideas, modeled them in three dimensions, and made changes to your design based on constructive feedback provided by others.

This activity is intended to help you start to package your design for presentation. You'll put together a narrative summary of your concept and you will arrive at an estimate of the amount of electricity that your artwork will produce in a typical year.

Please schedule a Skype based workshop with the LAGI team if you have any questions about this activity. We will make it as easy as possible for you!

STEP-BY-STEP INSTRUCTIONS

Step 1 (5 minutes)

Instructor leads with the following or similar questions to the entire group:
What did you find to be most challenging about designing your land art generator?
What came the easiest to you? Why?

Step 2 (10 minutes)

Consider referring back to the **LAGI Jury Example Presentation** and reading the creative statement that Santiago Muros Cortés wrote about his artwork, **The Solar Hourglass**.

Step 3

Students split into their design teams and one person on each team is selected to be the creative writer. This person will collect the thoughts of the group on paper or on the computer during the remainder of this activity.

Note: It's perfectly fine if you are working on a LAGI 2015–16 Youth Design Prize entry on your own. You can just ignore all of the references to the team and group. After completing each activity, consider sharing your work with someone (either an adult mentor or a friend) who can provide continuous feedback along the way.

Step 4 (20 minutes)

Instructor provides each team with a copy of the **Creative Statement Generator Worksheet** (on the following page). Working as a team, students fill in the worksheet questions, reflecting on the process that they went through to arrive at their solution. Teams should consider what the best way will be to convey to others the ideas contained within their design and the way they hope people will experience it when they visit the artwork.

Step 5 (15 minutes)

Reflect back on the **Energy Output Worksheet** that was used in the **Energy Fundamentals** activity. In that activity students used energy conversion efficiency and capacity factor to estimate the annual output of four different energy installations. Now teams will examine their own art installations using the same process.

Teams work on the **Adding Up Electrons** worksheet. It's a good idea to check each other's math because it's easy to make mistakes.

Step 6 (10 minutes)

Together, each team writes their final written narrative statement using the answers that have been generated with the two worksheets. This will be the document that will be uploaded with the LAGI 2015–16 Youth Design Prize entry.

Worksheet

Creative Statement Generator

Title of Artwork

Pictures and models are very important, but it's also important to provide a narrative statement that helps others to understand why you made the decisions that you made.

What is the best way for you to talk to others about your design? Perhaps you would like to explain how you derived the form of your artwork or why you chose to focus on one part of the site over another. How do you want people to experience your artwork when they visit it? Maybe the best way to talk about it is to tell a short story, or to make reference to the writing of others (if so, make sure to provide a proper citation).

Be poetic and get creative!
Using a separate sheet of paper, answer the six questions below.

1. Think back to when you were just beginning to research and come up with your first ideas. What was your biggest inspiration?

2. What are the first five words that come to mind when you think about your artwork?

3. Using the five words that you listed above, write a short paragraph that tells the story of your artwork. In the paragraph, explain how your concept relates to the context of the site.

4. Write three sentences that best describe what people will experience when they visit your artwork.

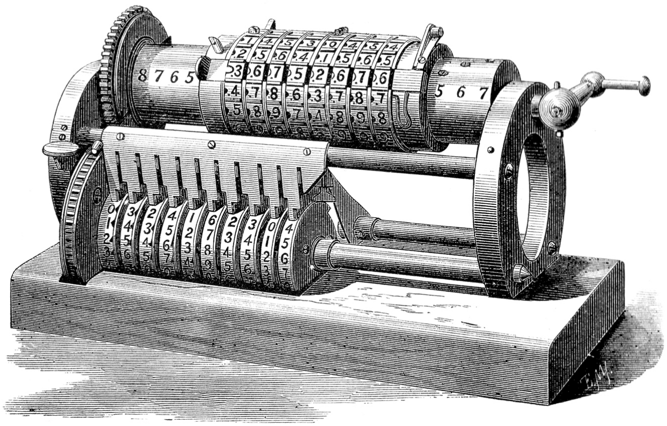
5. What renewable energy technologies does your artwork include? How are they integrated? Does their function rely on interaction with people? With nature?

6. Think of three ways in which your artwork will have an impact on the natural environment. Are you digging foundations in the sand to provide a structure for your artwork? What is living in the sand? Does your artwork extend out into the water? What is living there? For each of the three impacts, write a sentence about how you could minimize the effect on the environment and what regular maintenance might be required to counteract any negative effects.

Worksheet

Adding Up Electrons

Title of Artwork



Once your design is complete (or beforehand if you want to check things along the way), you'll need to take careful measurements of the dimensions of your energy technologies. Make use of the graphic scale on the **Site Plan Drawing**.

If you need to convert to or from metric units:

1.0 meter = 3.28084 feet	1.0 square meter (m^2) = 10.7639 square feet (ft^2)
1.0 foot = 0.3048 meters	1.0 square foot = 0.092903 square meters

Do you have solar panels in your artwork? If so, what is the surface area? If you have wind turbines, you can measure the swept area that the wind passes through. Similar rules will apply to other technologies. Once you have your dimensions, all you need in order to estimate the annual production of your artwork is the nameplate capacity and the capacity factor for each technology.

Step 1 See the list on the following page. Check the blue box next to each technology that you use in your artwork. It's OK if you only use one (simplicity is good). Be sure to separate out the different types of solar PV installations within your design (the capacity factor varies greatly depending on the orientation of your panels). If you aren't sure about the distinctions between technology types, please download and look through **A Field Guide to Renewable Energy Technologies**.

Step 2 See the box below. Do a separate calculation for each type of technology and then add your answers together to arrive at a total output for your artwork.

Surface Area #1 **x** nameplate capacity **x** capacity factor **x** 8,760 hours/year **=** annual output

m^2	Wp	%	Wh

Surface Area #2 **x** nameplate capacity **x** capacity factor **x** 8,760 hours/year **=** annual output

m^2	Wp	%	Wh

+ (repeat for **each** technology)

Total Annual Electrical Output **=** Wh

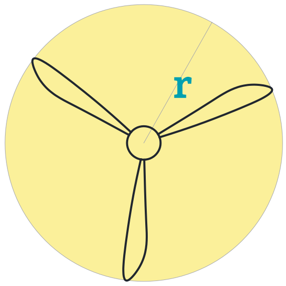
	nameplate (peak) Wp	capacity factor	type of technology
❑	200 Wp/m²	25%	Solar PV—Heliostatic (dual-axis sun tracking)
❑	200 Wp/m²	20%	Solar PV—Angled (south-facing 15–60 degrees from horizontal)
❑	200 Wp/m²	12%	Solar PV—Vertical (south facing > 60 degrees from horizontal)
❑	200 Wp/m²	17%	Solar PV—Horizontal (or < 15 degrees from horizontal)
❑	200 Wp/m²	10%	Solar PV—Facing East or West
❑	200 Wp/m²	4%	Solar PV—Facing North
❑	100 Wp/m²	see above	Flexible Solar Films (see PV angles above for capacity factor)
❑	300 Wp/m²	30%	Solar - CPV (heliostatic concentrated photovoltaic)
❑	250 Wp/m²	30%	Solar Thermal CSP (concentrated solar power) See Note 1
❑	250 Wp/m²	55%	Solar Thermal CSP with thermal storage
❑	100 Wp/m²	25%	Solar Pond with Rankine Turbine
❑	see Note 2	40%	Horizontal Axis Wind Turbine
❑	see Note 2	48%	Compact Wind Acceleration Turbine (ducted turbine)
❑	see Note 2	30%	Vertical Axis Wind Turbine
❑	see Note 3	60%	High Altitude Wind (kites, airborne turbines, gliders, etc.)
❑	1 Wp/m	30%	Wind Belts (measure the total length of belts)
❑	see Note 4	30%	Ocean Tide (assumes axial type with underwater blades)
❑	10 kWp/unit	25%	Wave Power—Buoy or Point Absorber
❑	500 kWp/unit	10%	Wave Power—Surface Following or Oscillating
❑	100 Wp/m²	5%	Biofuel (assumes fuel cell conversion to electricity) See Note 5

Note 1: Includes the following CSP technologies: parabolic trough, linear Fresnel reflector, Stirling dish, and solar power tower.

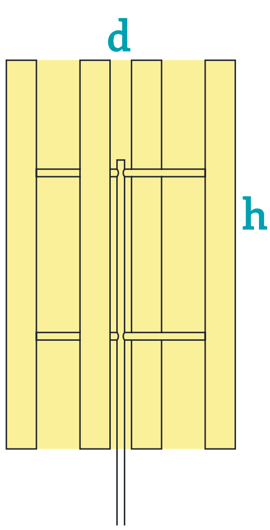
Note 2: Estimate the nameplate capacity for your wind turbine by multiplying the Swept Area by 68. The result is the nameplate capacity of your turbine in watts (____Wp). See the diagram to the right for help in determining the Swept Area (in yellow). For horizontal axis turbines use the area formula for a circle (πr^2). For vertical axis turbines, multiply the height by the diameter. This is a simplified version of the formula derived by Albert Betz in 1919. The complete formula is:

Power = 0.5 x Swept Area x Air Density x Velocity^3

In the simplified version we have included an air density (1.23 kg/m^3) and average wind velocity (4.8 m/s) at the design site, so the only thing you need to add to the equation is the area swept by your turbine blades.



horizontal axis turbine



vertical axis turbine

Note 3: For kites and gliders, calculate the area within the pattern that the kite or glider makes in the air.

Note 4: Similar to the formula for wind turbines but multiply the Swept Area by 500 instead of 68.

Note 5: Calculate the surface area of algae or biofuel crops that you are exposing to the sun.