HIGH

HIGH MUSEUM OF ART ATLANTA

TEACHER RESOURCE

JORIS LAARMAN LAB

DESIGN IN THE DIGITAL AGE

February 18–May 13, 2018

Named for its founder, the Joris Laarman Lab is a creative powerhouse of individuals working together to innovate new ways of imagining, designing, producing, and distributing functional works of art for humankind. For students, the Joris Jaarman Lab is a model example of the Framework for 21st-Century Learning—the Four C's. Each artwork in this exhibition is a culmination of Critical Thinking, Communication, Collaboration, and Creativity.

Joris Laarman (Dutch, born 1979), *Heatwave*, 2004, cast polyconcrete, courtesy of the designer.
PHOTO: Droog Design

Consider *Heatwave* (left). Part of Laarman's final thesis in design school, the wall sculpture with clear Baroque influences functions as a radiator. Its curves don't merely add aesthetic quality to the object; they make it more effective by increasing the radiator's surface area and thus its ability to radiate heat into the surrounding space. Crediting his professors as inspiring his appreciation for conceptual design, Laarman notes that he "wanted to make something totally over-the-top in style but functional at the same time—opposing the existing dogma of functionality having to be stripped of any ornament." Not only is this work an efficient radiator, it is infinitely adaptable because it is modular. Sections of the radiator can be connected to accommodate a large or small space and configured to fill that space—even curving around corners.

Connections to the Classroom

After they observe *Heatwave* closely and learn how it functions, students will be inspired to solve problems. Similar to how Joris Laarman innovated a new way to heat a room, ask students to solve an everyday, at-home problem. For example, can you create a device or alter an existing design that helps socks not to droop down? Or create a device that keeps soup at the right temperature without using a microwave? Students might also look for solutions to broader community issues, such as erosion or traffic congestion. Whatever problem they tackle, students will practice the 4 C's along the way. They'll also employ math skills as they collect and analyze data. They will acquire scientific knowledge as they learn more about the problem. They'll hone their speaking, listening, and writing skills as they work together and present their findings. Such STEAM pursuits can even happen in a Social Studies lesson when students learn about problems people have faced in other countries or time periods.

STEAM can be part of every classroom with students of any age, and there is no better way to introduce it than through the work of Joris Jaarman Lab. On the following pages are lesson ideas inspired by more works in the exhibition. Digital images of the works are available at high.org/explore_resources.

Especially for teachers is the STEAM Teacher Seminar: Design in the Digital Age, taking place on March 17 at the High Museum of Art. During this day-long seminar, educators will take a sneak peek at how this exhibition evolved, learn more about the designer, and experience an interactive workshop that can be taken back to the classroom. You can register at high.org/event/steam-teacher-seminar-design-in-the-digital-age.

FROM LEFT TO RIGHT: Joris Laarman (Dutch, born 1979), *Kilovoxel Table*, *Megavoxel Table*, *Gigavoxel Table*, 2011, nickel-plated neodumium voxels (10mm, 5mm, 3mm), Groninger Museum, with support of Mondrian Fund.

Digital Matter

A robotic arm constructed the three tables shown here from digital blueprints. Made of *voxels*—volumetric pixels—each table is the same design created in a progressively higher three-dimensional resolution. As we move from *Kilovoxel* to *Megavoxel* to *Gigavoxel*, the metallic cubes become smaller and thus show much more detail with each iteration.

Likely quite a few students will recognize the imagery in these tables' ornamentation as the clouds and flowers from Nintendo's world of Super Mario. The tables' imagery becomes crisper and more realistic just as Mario's has over the years of advancement in computer processing power and video game graphics.

Closely investigate the works. Encourage students to study the tables closely and list their observations aloud or on paper with words and/or sketches. Once students have studied one table, encourage them to compare and contrast all three. Ask open-ended comparison questions such as, "Which table is better and why?" or "Which one do you like best and why?"

Consider Pop Art in pixels. Using blocks of various sizes or graph paper of differing scales, encourage students to render an image/object/logo from popular culture multiple times in successively greater detail. What challenges do they encounter in each attempt? Which resolution was easiest? Which final product do they like the best? Why? Compare to works by Andy Warhol.

- For younger students, these artworks can foster early tactile exploration of place value. Choose a simple object in your classroom, such as the trash can or a lunchbox, and challenge students to build a replica of it multiple times, each time with blocks of smaller size. Compare the results with varying criteria: How many blocks did each building need? Which building was the fastest to build? Which one looks most like the original object?
- For older students, these works can spark detailed, real-world exploration of volume and ratio. Prompt students to devise equations to calculate how many voxels may be in each table, given the size of the voxels. Encourage students to mathematically work out the relationships among the tables' resolutions.
- Translate voxels into words. Encourage students to write a short descriptive poem—of 20 words, for instance. Encourage them to describe one of these works of art, another work of art from this exhibition, or any object. Then, prompt them to expand the poem to 30 words and then to 40. Compare and contrast the versions. What are the strengths and weaknesses of each? How does economy versus generosity of language contribute to the poems' overall impacts? Which one was hardest to write? Which one do they like best and why? Vocabulary generated during the poetry exercise could go into descriptive paragraphs or essays.
- Identify elements of Rococo style in these tables. Allow students to consider the anachronism of expressing it in pixelated form. What other contrasting styles/media can students combine?

Ivy **Climbing Wall PHOTO:** Joris Laarman Lab

Climbing

Like its namesake, this work of art climbs vertical surfaces, and it encourages its users to do the same. *Ivy* intertwines organic, aesthetic, and recreational qualities as it reinvents the botanical form into a decorative and fully functional climbing wall. Joris Laarman describes it as "an adventurous decoration."

This artwork is the product of collaborative effort among Laarman, climbers, and a climbing-hold producer. They made hand-sculpted foam models from sketches, and the models were used to create silicone molds for casting the grips. The final artwork is made from a polymer concrete made of polyester and silver sand.

- Allow your students to discover *Ivy*. Let them observe and describe the work in detail before giving them any information about it. Let them tell you what it reminds them of, what it might be made of, where it might be displayed, etc. An Artful Thinking Routine such as See/Think/Wonder would work well to drive such exploration. Once they've explored the work of art, show your students the video of a climber scaling *Ivy*. How do their perceptions change? What new impressions do they have after watching the work of art in action?
- Elementary students may connect to a playground more readily than a climbing wall. Let playgrounds drive your discussion of geometric and organic shapes. Most playscapes employ geometric shapes—A-frames, rectangles, and occasional circles and arcs. Show some images of traditional playgrounds and compare them to *Ivy*. How are they alike and different? What other living things have shapes that could be fun to play on? A tiger? A cobra? A dolphin? Allow students to sketch their ideas and/or build models of them out of available materials.
- Encourage older students to think metaphorically. If ivy inspires a climbing wall, what functional object might a tree inspire? Or a lily pad? Or a tulip? Provide botany books or online resources that can spark your students' consideration of botanical forms and how they can serve another function in a human environment.
- Try casting. If you do not have access to silicone molding material, consider that, for ages, metallurgists have molded in sand just as confectioners have in cornstarch. The process of model to mold to cast provides a strong demonstration of positive and negative space.
- Part of *Ivy*'s allure is the vantage point it provides. Laarman noted that it allows its users to "sit in that place you couldn't reach before" and "view something you see every day from a different angle." Let your students do just that. Encourage them to create a composition from an unusual or unexpected vantage point. It could be from up high, like atop *Ivy*, or it could be from below or to the side. Find places on your school grounds that could enable the process—on the playground, in a stairwell, peering up from beneath a piece of Plexiglas. Via these compositions, students can demonstrate understanding of perspective.
- In this exhibition are also sketches of *Ivy* during its development phase. Show these to students alongside the final work of art to demonstrate the creative process.

Experiments

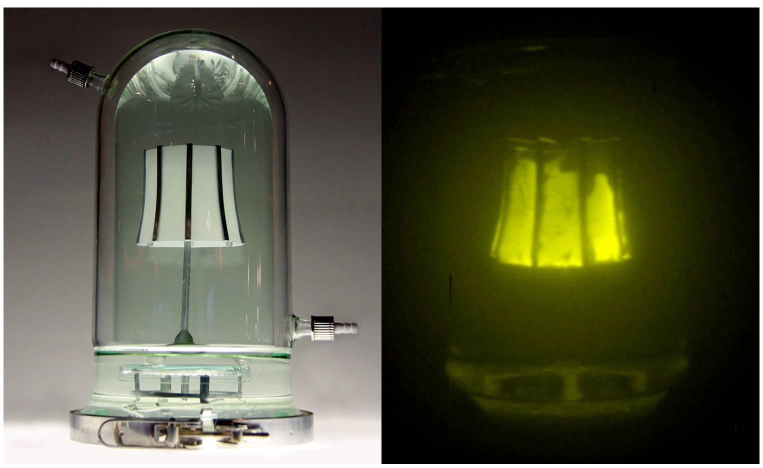
Here are two experiments, attempts to do something no one has done before. Allow investigation of these works to encourage and inspire your students' creativity and inquisitiveness.

Joris Laarman (Dutch, born 1979), *Time Capsule,* 2013, glass and aluminum, courtesy of Joris Laarman Lab.

Time Capsule

The Joris Laarman Lab team was tasked by Greenpeace to create an indestructible time capsule to rest on the Arctic Ocean floor. The project was part of the Save the Arctic initiative to raise global awareness about threats to the Arctic environment. How could they create a vessel to survive the harsh conditions at the bottom of the Arctic Ocean and simultaneously illustrate Greenpeace's mission to protect the planet?

Team members devised a spherical container mounted on a frame like a globe. The frame and all other hardware are titanium, and the sphere is made of special pressure-resistant glass that actually becomes stronger in the water pressure of the deep ocean. Inside the sphere are eight titanium-framed glass "cassettes." On each is etched significant information about efforts to preserve the Arctic, such as the names of almost three million people who contributed to the effort and a map of the North Pole. The information is etched into the glass cassettes in microscopic print, and a magnifying reader is included in the capsule. It was placed on the Arctic Sea floor on April 7, 2013. This exhibition includes an aluminum prototype.



Joris Laarman (Dutch, born 1979), *Half Life Lamp*, 2010, glass and cobalt chrome, courtesy of Joris Laarman Lab.

Half Life Lamp

What if we powered a lamp not electrically but biologically? That is precisely what Joris Laarman Lab team members and medical students set out to discover. The result was the *Half Life Lamp*, which successfully glowed via "biological power" at the Armory Show in New York City in 2010.

Encased in a glass "bioreactor," sheets of supportive material are mounted as panels on a lamp shade. The sheets serve as the growing surface for living cells. These cells are genetically engineered with luminescent firefly genes. When protected by a nutritional fluid and catalyzed with the right enzyme, the cells glow much like a glow-in-the-dark sticker. As it is a living organism, the lamp needs no electricity to glow, only proper environmental conditions.

- *Time Capsule* and *Half Life Lamp* both began as "what ifs." Team members began with ideas and worked through them to learn what would work and what wouldn't. What kinds of "what ifs" do your students have? What projects would they like to attempt? What experiments would they like to try? Encourage them to keep a running list.
- Both of these works spark contemplation of a global concern—the state of the Arctic or the implications of genetic engineering. What is a societal concern your students have? Encourage them to create artworks that represent and draw attention to this concern.
- The *Time Capsule* was quite an effort. What is going on in the Arctic to prompt it? Allow *Time Capsule* to launch your students' exploration of global climate change.
- How does one splice firefly DNA into cells from another organism? How do we know which parts of the DNA are responsible for its luminescence? These and more questions arise when students observe *Half Life Lamp*. Let it spark their investigation of genetic engineering.

Additional Resources:

Online: Go to jorislaarman.com to see more works from the team and learn more about their laboratory and process. Visit Anita Star's channel at vimeo.com for videos of these artworks and others in the exhibition vimeo.com/user5441285. To download free 3-D print files of some of the puzzle chairs, visit bitsandparts.org.

In Print: *Joris Laarman Lab* is an illustrated publication featuring these and many other works in the exhibition. All quotations in this resource come from the book. Star, Anita, ed. *Joris Laarman Lab*. New York: August Editions, 2017. ISBN 978-1-947359-00-0