**21st Century STEM is STEAM**

Current STEM teaching (Science + Technology + Engineering + Math) supports students with necessary skills to prepare them for the career challenges and 20th century literacies designed to contribute scientists, mathematicians, engineers and technologists to the world’s innovative economy. In the 21st century spirit of generous sharing and collaborative practices, design as an active practice learns from the world, engages the world and aims to improve the world. **STEAM by Design** introduces a multifaceted approach to 21st century education that transforms discreet subject introduction to trans disciplinary project based motivational learning with place based citizen engagement.

“**NEXT.cc** hits the 21st Century learning sweet spot! It is brilliant scaffolding for design-based learning. NEXT.cc delivers content in context embedded in templates and tools. It is at the right level between abstract concept and concrete instantiation. It builds both subject matter mastery and meta-cognitive skills. It reifies domain knowledge transparently as generative engagement. Seamlessly, it inculcates habits of attentive observation, heuristic discovery and self-reflection. It speaks epistemological authority with a light, non-pedantic voice.

It frames design broadly as best expressed by Herbert A. Simon, pioneer of computer science and artificial intelligence:

“Everyone designs who devises courses of action aimed at changing existing situations into preferred ones.”

**Beyond all that, NEXT.cc is intrinsically motivating - which is the fancy term for FUN!”**

Arnold Wasserman [www.arnoldwasserman.com](http://www.arnoldwasserman.com), [arnold@collectiveinvention.com](mailto:arnold@collectiveinvention.com), [arnold@ideafactory.com](mailto:arnold@ideafactory.com)

**STEAM by Design**

**STEAM by DESIGN** connects art and culture as dynamic creative processes combined with STEM practices as drivers of 21st century innovation. STEAM by DESIGN scaffolds design-based learning building subject matter mastery and developing meta-cognitive skills that encourage informal and lifelong learning in students and teachers. This session nurtures habits of attentive observation, heuristic discovery and self-reflection through access to sustainable art and design practices blurring boundaries between work, play, creativity and fun. Based on over 75 teacher professional development workshops, this award winning eLearning eco web, presented as a WAEA keynote and a TEDx, aims to empower art educators with new trans disciplinary connections, locally and globally, inspiring new ways of thinking, learning and making. Students use a wide range of physical and digital media to look at data, understand patterns, interpolate options, and strategize change. They use media to study, conceptualize, and engage their communities.
NEXT.cc is an eco web that develops ethical imagination and environmental stewardship.

...it introduces what design is, what design does, and why design is important

...it offers activities across nine scales - nano, pattern, object, space, architecture, neighborhood, urban, region, world

NEXT.cc reaches young people, their teachers and families with meaningful learning experiences that create positive influence on lives.

...journeys connect the classroom with the world; integrating virtual field trips, museums, institutions, and contemporary practices. Its informal learning is being accessed in 87 countries and 37 states

...workshops have reached over 5,000 teachers and 25,000 students

mission

nurture imagination

inspire wonder of the built and natural world

promote stewardship of the environment

enable eco literacy and digital fluency through place based design projects

connect classrooms in an eco-web community

history

NEXT.cc is a collaborative effort by principals, teachers, architects, artists and college art, art education, design and architecture students (MIT, Harvard, NYIT, CCAC, Parsons, SAIC, UWM).

Founded as an educational non-profit in 2007, NEXT.cc researches and creates transdisciplinary journeys that engage local ideas with global practices. Participants move from the computer into the community and learn about themselves, their neighbors, and their friends as they engage history and culture of place and explore sustainable design possibilities. NEXT.cc delivers eco literacy and digital fluency changing STEM (Science, Technology, Engineering and Math) teaching to STEAM (Science, Technology, Environment, Engineering, Art and Math).

awards

National Environmental Education Green STEM Innovator 2012
Union of International Architects Architecture + Children Golden Cubes 2011
Wisconsin Arts Board Creative Communities Grant 2011
USGBC Excellence in Green Building Education Award 2009
SAIC Presidential Urban Engagement Award 2009
American Architectural Foundation Merit Award 2009
National Endowment for the Arts Design Education Award 2008
American Architectural Foundation Merit Award 2006
about: NEXT.cc

NEXT.cc is an eco web that develops ethical imagination and environmental stewardship.

NEXT.cc introduces what design is, what design does, and why design is important. It offers activities across nine scales – nano, pattern, object, space, architecture, neighborhood, urban, region, and world.

NEXT.cc’s journeys introduce activities online, in the classroom, in the community and globally. NEXT.cc journeys and activities are supported with links to virtual field trips, museum interactives, and contemporary architecture, art, science & design practices.

how to: NEXT.cc

1. Go to www.NEXT.cc

Choose from 200+ journeys. At the top of the page, you may also select to view journeys that relate to specific topics.

2. Select a journey

To begin your journey, become familiar with background and terms associated with the journey.

3. Introduction to Journey

Observe, write, sketch, model, make, imagine, and create... in your community!

4. Explore

Check the Explore links to learn from contemporary art, science and design practices.

5. Activities

After you complete the activities, submit your work to the Gallery!

6. Submit to Gallery

Review what you learned!

7. Review

See related journeys and continue exploring natural and built systems, objects, media and environments.

8. Relate and Repeat

Share with friends.
Like us on Facebook.
Watch our videos on YouTube.

9. Show your teacher

10. Tell us if you’re using it

<lkeane@next.cc>
**Tools**

- 2d Geometry
- Air
- Alphabet
- Collaboration
- Color
- Weave
- Composition
- Decoration
- Design Thinking
- Detail
- Diagramming
- Film+Video
- Font
- Food
- Form
- Frames
- Imagination
- Information
- Journal
- Land
- Line
- Listening
- Maps
- Matter
- Measure
- Media
- Mind Mapping
- Modeling
- Nanotechnology
- Natural Light
- Numbers
- Objects
- Organization
- Painting
- Paper
- Patterns
- Perspective
- Photography
- Placemaking
- Plants
- Play
- Questions
- Rhythm
- Scale
- Senses
- Shading
- Shape
- Shelter
- Site Analysis
- Sketching
- Soil
- Speech
- Symbols
- Time
- Visual Note Taking
- Walking
- Water
- Waves
- Weave
- Well Being
- Word Webs
- Words
- Writing

**Language**

- 3d Geometry
- Adobe
- Animals
- Area
- Art Nouveau
- Artificial Light
- Beams
- Biomimicry
- Birds
- Books
- Categories
- Ceramics
- Chairs
- Cities
- Classical Architecture
- Climate
- Clouds
- Columns
- Design Research
- Drawing Types
- Energy
- Ergonomics
- Experience Design
- Facade Elements
- Family Tree
- Figure Ground
- Fish
- Food Culture
- Glass
- Grass
- Grid
- Housing Styles
- Insects
- Isometric
- Materials
- Metrics
- Nature Patterns
- Objects
- Object Description
- Optics
- Origami
- Place Exploration
- Pocket Parks
- Poems
- Precipitation
- Proportion
- Rocks
- Sculpture
- Sound
- Story Telling
- Streets
- Structure
- Symmetry
- Systems Thinking
- Temperature
- Tree Identification
- Trompe L'Oeil
- Vernacular Architecture
- Walls
- Water Quality
- Watershed
- Weather Windows

**Discovery**

- 21st Century Classroom
- 7 Natural Wonders
- Acoustics
- Air Quality
- AquaCulture
- Architectonics
- Bauhaus
- Bicycles
- Biofuel
- Biomes
- Bridges
- Building Types
- Buildings as Bodies
- Coral Reefs
- Cycles
- De Stijl
- Design Process
- Digital Modeling
- Earth
- Electricity
- Farmers Markets
- Forests
- Germs
- Green Building
- Green Materials
- Green Schools
- Growing Food
- Iron
- Lakes
- Landfills
- Mass Transit
- Mobiles
- Modern Architecture
- Music and Architecture
- Oceans
- Outdoor Classrooms
- Paper Airplanes
- Paper Engineering
- Pavilions
- Place Experience
- Plastic
- Prairie
- Prairie Architecture
- Public Space
- Rain
- Recycling
- Rivers
- Self Portrait
- Site Programming
- Solar Energy
- Solar System
- Sound Mapping
- Stairs
- Textiles
- Texture
- Truss
- Vermiculture
- Vertical Farming
- Water Conservation
- Wind
- Wood
- Word Forms

**Design**

- Aeronautics
- Airport Design
- Animation
- Aquaponics
- Architecture
- Architecture and Fashion
- Bike Lanes
- Bridge Design
- Bus Stops
- Business Card
- Car Design
- Cartoons
- Cereal Box
- Chair Design
- Design Making
- Eating Local
- Fashion Design
- Furniture Design
- Game Design
- Graphic Design
- Graphic Novel
- Great Lakes
- Green Cities
- Green Home
- Green Roofs
- House of the Future
- Industrial Design
- Information Architecture
- Interiority
- Jewelry
- Kites
- Landscape
- Light Design
- Logo Design
- Magazines
- Mobile Meal
- Murals
- Package Design
- Play Space
- Poster Design
- Rain Gardens
- Rainwater Harvesting
- ReBuild
- River Walks
- Shoe Design
- Signs
- Skyscrapers
- Space Planning
- Stage Set Design
- Suburbia
- Sunglasses
- Tiny House
- Tesselations
- Toy Design
- Urban Agriculture
- Urban Design
- Vegetable Gardens
- Water Taxis
- Wind Power
- Work Stations
- ZOOMS
What people are saying about NEXT.cc

I just wanted to let you know that after 2 or 3 years of being on your list of pilot teachers, I am finally using the site in my classroom. My kids LOVE it. They are 12-14 yrs. old and are finding so many great journeys to go on. We are using it as a way to teach independent projects in a more guided way before they leap off in designing their own journeys. I have never seen a group of 7th and 8th grade students so engaged for an hour working independently on their computers... wow.

Victoria Rydberg, RIVER CROSSING 7-8, Teacher of the Year 2009, WI DPI Environmental Education Consultant

I wanted to let you know I think your web site is amazing and such a wonderful resource.

Katie Netti, K-8 Visual Arts Teacher, Chicago, IL

Design thinking has taught us and our students new skills that traditional schools do not focus on. As a teacher I am more focused on the design process (are they brainstorming? are they coming up with solutions? how will you defend their answers? what are they going to build/mold/design?) as compared to many teachers who are focused on content deliverables (do they know which battles were key in the Civil War? Do they understand photosynthesis?). Students themselves are able to think for themselves and think OUTSIDE THE BOX! We started our school with many students thinking that display/trifold boards and key notes were “projects,” but now they are coming up with much more innovative ideas such as writing a diary as if a girl from the holocaust, designing an all green home -everything from blue prints, to samples of materials, to an actual model, an i phone application, a story about different animals for preschoolers, etc. They are realizing that they can use their talents and embed them into their education.

Ashley Hiser, LaCrosse Design Institute, LaCrosse, WI

I looked over your work on NEXT and I offer my congratulations on a great project.

Bruce MAU, DESIGN WITHOUT BOUNDARIES, MASSIVE CHANGE

NEXT.cc is a brilliant concept encouraging our students to be active in their communities as architects and educators. It introduces environmental issues and inspires design and education as ethical practices.

Sean S. Miller Director of Education Earth Day Network

Your presentation was great and the NEXT.cc web site is fabulous. What a great gift to the rest of us.

Richard D. O’Connor Ph.D., Executive Director, Oregon Building Congress

Thanks very much for an awesome workshop! You inspired me to collaborate to start a new architecture curriculum for this year including the whole school of nearly 1600 4th and 5th graders.

Craig Hamnett

I find NEXT.cc to be a powerful, intuitive and disarmingly engaging learning platform for students. We have deployed NEXT.cc at SUPAR, and it has been a great vehicle for supporting student directed exploration and discovery. As a project based high school, we value learning opportunities that engage our students in ways that require them to take leadership for their learning, NEXT.cc supports our pedagogical objectives very well. The modular nature of the NEXT.cc platform allows for the scaffolding of knowledge building, thus rewarding students by promoting their increased level of content competency while encouraging them by giving them opportunities to demonstrate their increased capacity to apply what they know. That said, NEXT.cc is a robust learning platform that could be applied in various education settings where creativity, global thinking and student-center learning is valued.

Dr. Kirk E. Harris, Faculty, UWM School of Architecture and Urban Planning & Founder, School for Urban Planning and Architecture

I just opened the NEXT.cc book, it looks fabulous.

Cathy Mott, Curator of Education, Muskegon Art Museum
STEM & Our Planet
The environment is a compelling context for teaching and engaging today’s students in science, technology, engineering and math (STEM).

**Science**
- Green chemistry alone is expected to grow from a $2.8 billion industry to about $100 billion by 2020.
- Environmental science jobs are expected to grow by 25% by 2016 — the fastest among the sciences.
- By 2014, about 2 million STEM-related jobs will be created.
- Only about 1 in 18 workers in America currently are in STEM fields.
- 99% of kids ages 6-11 believe that it’s important to care for the environment.
- 95% of STEM college students believe that math/STEM can help prepare students to address the world’s toughest problems.

**Technology**
- 78% of businesses and organizations believe that the value of job candidates’ environmental knowledge will increase in importance as a hiring factor.
- By 2018, there will be 1.4 million American computing job openings, but only 29% of those are expected to be filled by U.S. graduates.
- About 2 million organizations and businesses now produce or offer green goods or services.
- Environmental engineers are expected to have employment growth of 31% between 2008-18, much faster than average for all occupations.
- Workers with a STEM background have earned about 26% more, with engineers earning some of the highest avg. starting salaries for bachelor’s degrees.

**Math**
- Nearly 4 in 5 STEM students decided to study math/STEM in high school or earlier.
- Employment of mathematicians is expected to grow by 22% between 2008-18, much faster than average for all occupations.

**Engineering**
- Civil engineers, who increasingly deal with the environment, are expected to have employment growth of 24% between 2008-18, much faster than avg. for all occupations.

Sources:
- Boys & Girls Clubs of America
- Business & Environment Program of NEEF
- Economics and Statistics Administration, U.S. Dept. of Commerce
- Harris Interactive
- Kelion Research
- National Center for Women & Information Technology
- NC STEM Community Collaborative
- Pike Research
- Rutgers, The State University of New Jersey

Find out more: www.eeweek.org
Water Journeys

Ethical Imagination and Environmental Stewardship

The Wyland Foundation has partnered with NEXT.cc to provide the following water journeys to reach young people, their teachers and their families with meaningful learning experiences that create positive influences in their lives.

- Water
- Waves
- Watershed
- Water Quality
- Water Conservation
- Precipitation
- Rainwater Harvesting
- Raingardens
- Clouds
- Climate
- Rivers
- Great Lakes
- Oceans
- Coral Reefs
- Aquaponics
- Water Taxis

NEXT.cc is a 21st century Eco Web of researched resources dedicated to transforming teaching and learning into a relevant, fun, anywhere anytime activity. NEXT.cc’s resources encourage exploration of local communities while enabling virtual field trips to international institutions, museums, and contemporary practices. Participants learn the humane role of the built environment exploring journeys and working on the computer, in the classroom and in their cities. NEXT.cc introduces a systems thinking approach to connect traditional subjects in place based projects across nine scales: nano, pattern, object, space, architecture, neighborhood, city, region and world. Journeys introduce tools that artists, scientists and designers use to engage the world. Language journeys introduce vocabularies and principles tied to CCSS. Discovery expands awareness of relations between systems. Design journeys present opportunities for active citizenry and real world innovation.

Learn More