



[www.Aqueductfutures.com](http://www.Aqueductfutures.com)

## INTRODUCTION

This guide is directed at educators, parents, and students during their visit to the [aqueductfutures.com](http://aqueductfutures.com) and exhibit at Los Angeles City Hall (November 6th – December 6th, 2013). As global citizens, we all need the ability to engage our complex world in order to secure a better future. Educators and parents have the responsibility to facilitate our students' engagement responding to environmental and social change.

The guide provides resources for educators to further understand of the water/energy *nexus*. Each resource features hands-on or online activities, and most are free or available at nominal cost; a few require the educator to have a password or similar for access.

Devices such as smart phones or tablets were developed using the knowledge and know-how past and present innovators. Similarly, it is the energy and creativity of current youth that will sustain our future.

### ***Nexus***

- 1: connection or link between parts of a system
- 2: a connected group or series
- 3: center, focus

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### **ABOUT THE AQUEDUCT FUTURES PROJECT**

Aiming to inspire civic imagination about the future of the water supply system for Los Angeles, the project is researching the impacts of landscape created by water imports to Southern California. Casting a fresh look on the emergence of urban Los Angeles catalyzed by the massive transfusion of water via the Aqueduct, the exhibit provides a unique view into the connections between water, energy, ecology, economics, and culture in California.

## A REFLECTION

Before going further, take a moment to consider the following brain drops and add your own:

- 💧 **Who?** Is there target group in mind? (science students, English Language Learners, homeschooled children, visual, auditory, kinesthetic, other learners)
- 💧 **What?** Are you looking for lesson plans, new activities, or other resources? Is the ---teacher/educator driven, student-driven or a mix? Does the lesson need to meet California and/or national education standards? Are there any associated costs (special equipment, online access, other)?
- 💧 **Where?** Will this happen in school or another learning environment?
- 💧 **How?** Is there easy access to the lesson/activity plan and its components? Is there a need for assessment tool such as grading?
- 💧 **Which?** Which students work best in teams, one-on-one or individually?
- 💧 **How?** How much time is needed to complete the lesson or activity?
- 💧 **Who?** Who can provide additional support (teachers, student peers, volunteers, parents, college students, scientists and technicians)
- 💧 **How?** How comprehensive is the lesson/activity? Does it include more than one subject (for example writing and presenting as part of an algebra lesson)? Is the resource current, accurate, and and/or have an engaging format?

Most important is to identify your goals and challenges

- 💧 Consider energy and water, past, present and future in your region
- 💧 Check for potential socio-economic, environmental or other bias in education resources.
- 💧 Suggested activities for use of static or dynamic content.

## RESOURCES

In order to assist serving your students' interest or needs, here are four starting point:

	<b>Local</b>	<b>State</b>	<b>National</b>	<b>Global</b>
<b>Source</b>	Los Angeles Department of Water and Power	California Environmental Protection Agency	United States Environmental Protection Agency	Project WET Foundation
<b>Link</b>	<a href="http://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-iourcommunity/a-ioc-educationalprograms/a-ioc-ep-mathandsciencelessons?_afdf.ctrl-state=vi2wykatc_77&amp;_afL_oop=148622314668000">www.ladwp.com/ladwp/faces/ladwp/aboutus/a-iourcommunity/a-ioc-educationalprograms/a-ioc-ep-mathandsciencelessons?_afdf.ctrl-state=vi2wykatc_77&amp;_afL_oop=148622314668000</a>	<a href="http://www.californiaeei.org/">www.californiaeei.org/</a>	<a href="http://epa.gov/climatechange/kids/index.html">epa.gov/climatechange/kids/index.html</a>  <a href="http://epa.gov/climatechange/kids/resources/index.html">epa.gov/climatechange/kids/resources/index.html</a>	<a href="http://projectwet.org/store.projectwet.org/index.php/educators-guides/water-quality-educators-guide.html">projectwet.org/store.projectwet.org/index.php/educators-guides/water-quality-educators-guide.html</a>
<b>Subjects</b>	Math, science, technology	History/social science, science	Science	Science; multidisciplinary
<b>Grade levels</b>	6-12	5-12	6-8	4-12
<b>Access</b>	Download	CA public school educators with password	online	Free or purchase at nominal price
<b>Associated costs</b>	Internet access Equipment for some hands-on activities	--	Internet access	Internet access; varies depending on curriculum and training

## Aqueduct Futures' Guide for Educators

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<b>Educator involvement</b>	High	TBD	Moderate	Moderate to high
<b>Funded by</b>	Los Angeles Department of Water and Power	State of California, The David and Lucile Packard Foundation and others	Government of United States (Environmental Protection Agency)	501(c)(3) non-profit funded through fundraising and grants
<b>Other support</b>	Target Science Teacher Network, a program of the Los Angeles Education Partnership (formerly Urban Education Partnership)	<a href="http://www.californiaeei.org/History/default.htm">www.californiaeei.org/History/default.htm</a>	<a href="http://epa.gov/climatechange/kids/references.html">epa.gov/climatechange/kids/references.html</a>	<a href="http://projectwet.org/water-education-project-wet/sponsor-donor-partner-project-wet/">projectwet.org/water-education-project-wet/sponsor-donor-partner-project-wet/</a>
<b>Use of design elements</b>	Fair but adequate for purpose	High	High	Moderate to high depending on resource
<b>Resource strength(s)</b>	Pilot tested by LAUSD teachers; career oriented	New content/format for environmental education	Content is clear, easy to understand	Mix of static and dynamic content
<b>Resource weakness(s)</b>	Difficult to duplicate due to teacher time constraints	Limited potential to develop student interest in STEM unless there are changes in public education	Unlikely to trigger student discussions on political issues related to climate change	Time needed to go through the educational tools and to make follow-up calls for
<b>Climate zone(s)</b>	Arid	Arid and semi-arid	Wide range	Wide range; depends on lesson plan or activity guide
<b>Makes connection to water use &amp; lifestyle</b>	Yes	Yes	Yes	Yes

### MATH AND SCIENCE TO ENSURE THE FUTURE OF LOS ANGELES

#### a brief study

*The man ignorant of mathematics will be increasingly limited in this grasp of the main forces of civilization. (John Kemeny)*

Source: <http://quotes-for-teachers.blogspot.com/2011/06/math-and-science.html>

The Los Angeles Department of Water and Power in collaboration with the Los Angeles Unified School District and Los Angeles Education Partnership developed ten math and science lesson plans. The 2008 project pilot tested these lessons in the classroom environment. By using hands-on activities, scenarios and team work, students in Grades 6 through Grades 12 are exposed to the real-world of water and energy. Teachers provide the framework and materials for group work and allow students to develop a deliverable such as a report or a presentation. Student learning is reinforced across disciplines. For example, language arts skills (vocabulary, reading, speaking, etc.) are reinforced during the lesson.

What makes the LADWP math and science lessons stand out is the develop the skills needed for success in college and in workforce in a non-threatening way. In fact, several lessons feature interviews of an LADWP employee. While the content is solid, this resource needs reworking to reach a wider audience in Los Angeles (and beyond) such as home school educators, Girl Scout volunteers, 4-H Youth Development and others.

**INTEGRATING THE AQUEDUCT FUTURES PROJECT INTO STEM CURRICULUM**

Subject		Grade Level	Number of Lessons	Student Teams Produce	Key Career Skills	Careers of the Future
<b>Mathematics</b>	Algebra 2: Data Analysis & Algebra: Linear Equations	9, 9-12	2	Tables with graphs, charts, essays	Cooperation Research	UNLIMITED
<b>Science</b>	Energy and Renewal Resources	6	3	Lab reports	Problem-solving Analytical thinking	
<b>Biology</b>	Water Quality	7-10	2	Lab reports, PowerPoint presentations	Planning Writing	
<b>Physical Sciences</b>	Chemistry	8	1	Lab reports	Presenting Evaluating	
<b>Earth Science</b>	Energy and Renewal Resources	9-12	2	Models		

### LAST THOUGHTS

Aqueduct Futures illustrates some of many ways to understand our past and the present, to tell stories about quantities and interperate data, and to glimpse possible future scenarios. Formal and informal education provides opportunity to learn and understand how water and energy sustain us. This guide is just a drop in the educational bucket; it is also an invitation to quench your thirst on the journey towards the future.

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