

FT for schools: Learning to live with climate change in L.A activity sheet 8

This resource was written by Stephen Schwab, author, and geography consultant.

Introduction

With a 1.5°C rise in temperatures now seeming inevitable as a result of climate change, California is becoming a laboratory for human adaptation and water resilience.

The article

www.ft.com/content/149a7cfb-46a7-43f8-8b38-141448d67745 and read about climate change, and water resilience in Los Angeles.

Specification links

AQA

A level 3.2.5.3 Water security, *strategies to increase water supply to include catchment, diversion, storage and water transfers and desalination.*

Edexcel A

A level Topic 5: The Water Cycle and Water Insecurity, 5.9 *There are different approaches to managing water supply, some more sustainable than others.*

OCR

Topic 1.2 – Earth’s Life Support Systems, 4.a. *The two cycles are linked and interdependent.*

WJEC

A level 3.1: Water and Carbon Cycles, 3.1.5 *Deficit within the water cycle.*

Activity

Los Angeles water security

1. What evidence does the author present to suggest that Los Angeles is suffering water stress?
2. Los Angeles’ Mediterranean/marginal arid climate always meant that water security would be difficult to attain. Name two cited management strategies that secured Los Angeles’ water supply and enabled urban growth during the 20th century.
3. Use the Google Maps terrain layer to explain why the physical geography of the Owens Valley and San Fernando Valley made them suitable areas to source water from.

Study the timeline of selected events related to Los Angeles water history.

| Date | L.A population | Events |
|------|----------------|---|
| 1877 | 9,000 | W. Mulholland first visited L.A. |
| 1900 | 102,000 | |
| 1905 | | L.A. filed for Owens River water rights in the Eastern Sierra Nevada 250 miles NE |
| 1910 | 319,000 | |
| 1913 | | 233-mile aqueduct completed to L.A. with capacity to provide 4x the amount of water then required |
| | | Owens Valley had 75,000 acres of irrigated farmland |

| | | |
|-----------------|-------------|---|
| 1920s to 1930s | 577,000 | L.A. buys land and converts it to grazing reducing amount of irrigation required |
| 1924 | | Owens Lake reduced to dry bed due to abstraction. 'Water wars' begin with local ranchers and businessmen who dynamite the aqueduct 17 times |
| 1938 to 1950 | | L.A. sells property in Owens valley to avoid heavy land tax whilst retaining water rights |
| 1940 | 1.5 million | Irrigated cropland in Owens valley 23,625 acres |
| 1970 | 2.8 million | Second aqueduct completed |
| 1970 to present | | Continuing pressure campaigns and disputes/discussions between Inyo County and L.A. water to change legislation to maintain water for fish, natural habitats and tourist industry needs in Owens Valley |
| 2013 | | L.A District Water Project to control dust in water |
| 2020 | 3.9 million | Situation of extreme drought in L.A. |

Table 1

4. Suggest why sourcing reliable water has created conflicts to the current day in this area (www.inyowater.org is a helpful website for further detail).
5. How does the author describe the extent of global warming's effect on L.A. drought, temperature, and water supply?
6. Read the following quotes.

Some people love L.A., some [other] people call the city 'Smell-L.A'...the San Fernando and San Gabriel valleys have been polluted with industrial flows and dirty runoff.

Groundwater contamination, a growing problem in L.A. Counties, San Diego Pollution Trackers, University of San Diego May 2018

As of 2012, 57 (out of 115) groundwater production wells have been removed from service due to contamination. The City of Los Angeles will lose the ability to use its groundwater if contamination issues are not addressed.

San Fernando Basin Groundwater Remediation & Clean-up Initiatives and Groundwater Replenishment Stephen A. Ott et al. Southern California Water Dialogue October 23, 2013

L.A. is a water hungry city with a huge population (since 1913) and a high standard of living. Using the article and the above quotes, outline another significant factor increasing water stress.

7. Daniel Griffin, Professor of Geography at the University of Minnesota, states 'I don't think we can just engineer our way out of this problem' whilst L.A. mayor Eric Garcetti plans to create sustainable water supplies which require both technological management strategies (to conserve and increase water resources) *and* resident behavioural change to decrease demand.

Draw a table of 2 columns, title one Technological fix and the other column Behavioural fix.

Using the article, describe the various adaptations and responses to water problems in the appropriate column. *Include the terms wastewater, greywater, storm water, recycling, rainwater capture, desalination, groundwater abstraction and treatment.*



8. In the UK planting woodland and meadows is encouraged whilst removing urban vegetation cover is discouraged by environmental management agencies. Suggest reasons for the different approaches in the UK and L.A.
9. In the light of the upcoming COP26 Climate Change Conference in what ways can L.A. be a model for other cities globally?

Sustainable urban development

1. Note two ways L.A. has contributed to global warming with greenhouse gas emissions.
2. L.A. now seeks to lead the way in combating greenhouse gas emissions by achieving Energy Sustainability by 2035.

Complete the table to show some of the ways it seeks to achieve this.

| Approach | Explanation |
|------------------------------------|-------------|
| Legislation | |
| Transportation | |
| Power production | |
| Incentives to residents/businesses | |

Table 2

3. Watch the video [Green Solar Technologies Excited for Plan to Make LA More Sustainable](#), describe the physical and human assets L.A. has that make mayor Eric Garcetti plan's possible, and the advantages of the plan claimed by this one company.
4. The FT article suggests several hazards associated with climate change that threaten the sustainability of the city. What are these?
5. Rank the problems in the order you consider most pressing for L.A. to those you consider least pressing.

Further work

- Read [Building climate-resilient cities](#) in the article 5 'lenses' of climate action are proposed to expand on traditional mitigation and adaptation approaches.
 - Define each of the 5 lenses of climate action
 - Give examples of how cities are addressing climate change through each lens
 - The report concludes that fighting climate change will need 'a broad ecosystem' and that cities will need to play the role of 'convener' in this 'broad ecosystem'. Explain what this means.
- A Greater L.A [Climate Action Framework](#)
- L.A Times [Dozens of L.A. County communities face growing peril from fire, heat, flooding](#)