



URBAN WORLD ACTIVITY

XERISCAPING



Jane Goodall's
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XERISCAPING: (CREATING A LOW WATER GARDEN)

This activity is all about creating a garden that uses as little water as possible – known as ‘xeriscaping’. Abu Dhabi has one of the highest rates of water consumption in the world, estimated at 550 litres of water per person per day. Use this activity to learn about xeriscaping as a way to save water, and, if you have an existing garden, start to convert it to a xeriscape or plant a xeriscape garden from scratch.

In this activity you and your students will:

- ▶ Learn what xeriscaping is.
- ▶ Learn about plants native to UAE, particularly the Ghaf tree.
- ▶ Start a long term project to convert an existing garden to a xeriscape/start building a xeriscape from scratch.

OBJECTIVES

Carrying out this activity will help students learn about the amount of water that different plants need to grow and the different methods of irrigation that can be used. But we do not just want talk, we want action! Start a long term plan to convert an existing school garden to a xeriscape, or start building a xeriscape from scratch.

WHAT DO I NEED TO MAKE IT WORK?

You do not need anything special for the first, theoretical part of this activity (which can be done in the classroom), just some materials for creating a poster for your school and an internet connection to carry out some background reading. For the second part of the activity we would like you to start a long term practical gardening project either by converting part of a current garden into a low water garden, or by creating a new low water garden (xeriscape) from scratch.

WHAT THINGS WILL MY STUDENTS CREATE?

- ▶ A xeriscape poster for the classroom, showing ways to create/maintain a garden that uses very little water.
- ▶ If possible, over time, a xeriscape garden.

INTRODUCTION TO XERISCAPING

The first part of the activity is to understand the key concepts of xeriscaping and its benefits for the local environment. The following links give you a lot of background information on xeriscaping – just type the short link into your web browser’s address bar to access the resource:

- ▶ goo.gl/NFr4UU – ‘What is xeriscaping’ from National Geographic.
- ▶ goo.gl/ez4cNf – a long introduction to xeriscaping with ideas on how to set up a xeriscaped garden.

THE PROBLEM WITH GARDENS...

Ask your students to consider these facts:

- ▶ Abu Dhabi has one of the highest rates of water consumption in the world, estimated at 550 litres of water per person per day compared with 85 litres in Jordan, a country with a similar climate. The current usage of groundwater reservoirs is about 15 times more than the natural recharge rates, so the difference has to be made up using desalination plants which use a lot of energy (hence contributing to climate change) and discharge highly salty water into the sea (bad for marine life).
- ▶ Some plants need a lot of water to grow. Plants with large glossy dark leaves tend to absorb more heat and require a lot of water, and a larger leaf surface area equals greater water loss. One example is hibiscus:



Hibiscus clayi flower and leaves. By Marshman at en.wikipedia / Eric Guinther (Transferred from en.wikipedia) [GFDL (www.gnu.org/copyleft/fdl.html) or CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons



The Ghaf tree (*Prosopis cineraria*), By LRBurdak (Own work) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC-BY-SA-3.0-2.5-2.0-1.0 (<http://creativecommons.org/licenses/by-sa/3.0/>)], via Wikimedia Commons



Lawn sprinklers. By Ildar Sagdejev (Specious) (Own work) [CC-BY-SA-3.0 (<http://creativecommons.org/licenses/by-sa/3.0/>) or GFDL (<http://www.gnu.org/copyleft/fdl.html>)], via Wikimedia Commons

- ▶ Other plants are much better adapted to a dry climate and need much less water. An example is the Ghaf tree (*Prosopis cineraria*) which is native to Abu Dhabi.
- ▶ When watering gardens using e.g. a sprinkler, a lot of water just evaporates or runs off, going to waste. Lawns are a particular problem here.

Now ask your students to think about what this means and what we can do about it. Depending on the age of the students you will need to give them more or less guidance here, but the key idea we are trying to convey is that gardens are a key contributor to Abu Dhabi's water use, which needs to be reduced. So, assuming we want to keep gardens (we do!) there are two things we can do:

- ▶ Replace the plants in the gardens with species that require less water.
- ▶ Reduce the amount of water wasted when watering the garden.

LOW WATER USE PLANTS

Depending as to the age of the students, here, you could lead a general discussion about low water and native plants and their advantages or you could just discuss the Ghaf tree.

Low water plants often tend to be natives of the area and have smaller leaves than water-hungry varieties. Some, like cacti and succulents are spiky but still beautiful, especially when in flower. In addition to saving water, native plants provide shelter and food for wildlife such as birds and are more resistant to local insects and diseases, meaning less use of pesticides and other chemicals. Abu Dhabi Municipality says that, since 2010, native plants have made up about 35 per cent of the capital's ornamental landscaping for these reasons.

An indigenous species of the UAE, Oman and Saudi Arabia, the Ghaf is a drought-tolerant, evergreen tree which is, possibly, the sturdiest plant of the harsh desert environment. In the UAE, it can be seen growing on low sand dunes, undulating sand sheets and along margins of gravel plains mostly in the emirates of Abu Dhabi, Dubai, Sharjah and Ras Al Khaimah.

For more background information, see the following short links (just type them into the address bar of your web browser).

- ▶ goo.gl/POeedy – How native plants can save millions of gallons of water in the UAE
- ▶ goo.gl/uD99ae – Irrigation costs can be cut 'using native plants in landscaping'
- ▶ goo.gl/eu0HlV – The Story of the Ghaf
- ▶ goo.gl/64uV1e – Plants of the UAE (in pictures)

BETTER WATERING (IRRIGATION)

The other aspect to xeriscaping is to make sure that any water that you do use is used as efficiently as possible. Brainstorm with the students to come up with any ideas they can. The key factors are:

- ▶ Design the garden so water is not lost to run-off.
- ▶ Always water close to the ground so less water is lost to evaporation and missing the target area.
- ▶ Only water as much as is required so as not to lose excess water to evaporation.
- ▶ Water when the temperature is cooler, such as in the evening or early in the morning.

If you want to look at this topic in detail, consider looking at drip irrigation (see goo.gl/SFhbPy) and this amazing matting: goo.gl/8Cm0SA and goo.gl/d7x3jW

SPREAD THE WORD

Now your students have an understanding of xeriscaping, they should spread the word to the rest of the school. There are lots of ways to do this, but one simple thing to consider is making a poster for the school. This should explain what xeriscaping is and how important the concept is in Abu Dhabi. Include pictures if you can – the websites already mentioned are a great start to find these, and here are some links to Pinterest which has some great pictures of xeriscape gardens:

- ▶ goo.gl/1P6XxS
- ▶ goo.gl/nin15W
- ▶ goo.gl/yJohRh

PUT IT INTO PRACTICE – MAKE YOUR OWN SCHOOL XERISCAPE!

Having done the theory, it's time for some practical work! This will be a long term project, but a really worthwhile one. We would like you to either:

- ▶ Redevelop part of the school garden to turn it into a xeriscape (this is the preferred option as it will reduce water use). Or;
- ▶ Create a new xeriscape.

If neither of these options are possible, then instead encourage any of the students who have a garden at home to make as many water savings as they can, perhaps by replanting or improving irrigation.

Whatever you do, planning is the key. Use goo.gl/ez4cNf to take you through the steps of planning and setting up a xeriscape and if you've got the space, then plant a Ghaf (see goo.gl/15HRHD)!

KEEP US UP TO DATE



Please keep us up to date with how well this activity went and how your garden is growing. Just send us an email with details (and some pictures) to MrH@rootsnshoots.ae and let us know what you have been up to, and we'll feature it on the website!

WANT TO HELP IMPROVE THIS ACTIVITY?

This activity is a living document! Please help us by editing this activity to make it as good as possible. You can edit it by using this short link (just type it into your web browser's address bar): goo.gl/hzXpKQ – full instructions are provided. Any edits that can make this resource easier to use in the classroom or more applicable to life in Abu Dhabi are very welcome, so please follow the link and make your contribution!

APPENDIX – LINKS TO OTHER PROGRAMMES

LINKS TO ABU DHABI EDUCATION COUNCIL (ADEC) CURRICULUM STRANDS:

- ▶ **Living World** – this activity is about reducing water use in the garden, meaning ground water is preserved and energy use and desalination minimised, with positive effects for the living world. By creating a garden that has a higher percentage of native species you will also be helping and encouraging local wildlife.

LINKS TO ENVIRONMENT AGENCY – ABU DHABI (EAD) PROGRAMMES:

KEY AREAS

- ▶ Direct link to **Biodiversity** – this activity encourages the use of native plant species in urban areas, thus encouraging local wildlife.
- ▶ Direct link to **Water** – this activity is all about reducing water use.
- ▶ Indirect link to **Air** – reducing water use means less energy used in water treatment and desalination, so less air pollution.
- ▶ Indirect link to **Climate Change** – reducing water use means less energy used in water treatment and desalination, so fewer emissions and less impact on the climate.

(CURRENT ENVIRONMENT (HABITATS):

- ▶ Direct link to **Desert** – this activity encourages the use of native plant species in urban areas, building a greater understanding of the desert ecosystem.
- ▶ Direct link to **Ground Water** – this activity is all about reducing water use.
- ▶ Indirect link to **Marine** – reducing water use in the home means less desalination and hence less discharge of high salt content brine into the marine environment.