

# GREENING OUR CITY

## Urban Heat Education Resource for Community and Schools

Heat is a challenge that impacts all of Australia and is particularly challenging for Western Sydney. Penrith City Council has compiled this resource to help teachers explore this complex challenge with their students, drawing on resources from organisations from across Australia as well as information specific to Penrith.

**As part of Penrith Council's Cooling the City Strategy, Council has been proudly delivering tree planting projects thanks to funding from the NSW Government's Greening our City grant program in association with Local Government NSW.**

## Benefits of tree planting

We plant trees for a variety of reasons. There is a lot of research highlighting the benefits of planting trees. Some of these benefits include:

- Reducing ambient air temperatures
- Improving air quality and filtering pollutants
- Filtering stormwater runoff
- Protecting biodiversity (our wildlife and flora)
- Improving mental health and wellbeing.

As part of this project, we are encouraging local schools to explore urban heat islands and the important role that trees play in protecting the community.

## What is the urban heat island effect?

Urban heat islands are often highly populated urbanised areas that experience hotter temperatures than their less densely populated surrounding environments.

These areas often feature large amounts of hard surfaces such as roads, buildings and car parks, and fewer significant green spaces. The hard surfaces absorb heat caused by the sun's UV rays during the day and slowly release this heat back into the atmosphere in the evening, effectively increasing ambient air temperatures in these areas by 1.5 - 2.7 degrees Celsius (which is the "urban heat island effect").

Without sufficient tree cover, hard surfaces can reach alarming temperatures during summer.



## More about this educational package

For your convenience, we have put together a package of links and activity inspiration relating to these topics and curriculum outcomes.

Additionally, we're inviting school students to participate in a poster design activity to help promote the benefits of trees by illustrating what a "cooler, greener future for Penrith" looks like to our younger generation. Planting trees is a long-term strategy to cool our City and we feel it is important for young people to be involved in shaping Penrith's greener future.

Find out further information about the Greening our City tree planting program and Council's Cooling the City on our website.


- [Greening our City](#)
- [Cooling the City](#)

# POSTER DESIGN

Students are to illustrate what a greener future for Penrith looks like using the A4 PDF template provided and complete the sentence "I love trees because..."

Stand out designs will be printed and displayed at various planting sites across the Penrith Local Government Area in support of creating positive outcomes for the community. Additionally, they may be featured in social media posts on Council's channels and the Your Say Penrith pages that are dedicated to the Greening our City program and Cooling the City initiatives.

**A COOLER, GREENER FUTURE FOR PENRITH**



(Optional)  
NAME: \_\_\_\_\_  
SCHOOL: \_\_\_\_\_  
AGE: \_\_\_\_\_

I love trees because \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Entries can be sent in via email or collection from schools can be arranged by contacting the Sustainability and Resilience team. To arrange collection, or enquire further about this activity, please email [sustainabilityteam@penrith.city](mailto:sustainabilityteam@penrith.city)

# RESOURCE LINKS

## Urban Heat Islands

**Introduction to Urban Heat** – Article By Karen Player, February 13, 2020

This article briefly explains urban heat islands and their impact on the environment and human health, with supporting graphics and a short video by The Age.

## Related Videos

### **Cooling the City – Tackling Urban Heat**

A 2-minute video that introduces the concept of the urban heat island effect and the steps Penrith City Council is taking to reduce urban heat.

### **The Urban Heat Island Effect**

A 1.5min video from [australianenvironmentaleducation.com.au](http://australianenvironmentaleducation.com.au) on the urban heat island effect.

### **Cooling the City Masterclass**

The Cooling the City Masterclass video series collection features talks from several leading environment professionals exploring innovative heat reduction strategies to lower air temperatures across Sydney and further abroad.

### **Resilience and Urban Heat in Western Sydney**

The Resilience and Urban Heat in Western Sydney video series features an animation on cooling the City and the urban heat island effect. It also includes videos on how trees are transforming Penrith, using data to tackle heat, resilience in action, and adapting homes to beat the heat.

### **Western Sydney Heat and Social Housing**

This video from Link Wentworth (a local social housing provider) is a good overview of the challenge of heat and the impact it has on residents in Western Sydney

### **How to Stay Cool This Summer**

This video from Link Wentworth provides hints and tips for residents on how to stay cool in summer, particularly people who are renting and are in social housing. It also includes tips for individuals and families who are not able to afford upgrades to their homes like insulation.

## What is Urban Heat? - NASA – Climate Kids

### Urban Heat Island Effect: Here is What You Need to Know

Australian Environmental Education has provided a valuable resource explaining everything students may want to know about urban heat and the urban heat island effect. It is suitable for primary aged children.

In particular, it:

- Identifies key differences in urban and rural landscapes.
- Introduces students to the process of 'evapotranspiration' and the heat absorbing qualities of common building materials.

## National Parks Western Sydney – Cooling the Schools

### Cooling the Schools (Stage 3 — Years 5-6)

A geography unit for Stage 3 students. This teaching resource aligns with the learning outcomes and course content in the NSW Geography, Science and Technology and English syllabuses

## Benchmarking Summer Heat Report – Penrith City Council and Western Sydney University

### Benchmarking Summer Heat Across Penrith

This report was prepared by Western Sydney University as part of Penrith Council's heat sensor project and can be used to discuss the distribution of the urban heat island effect.

Opportunities for learning: Students investigate which areas of the schoolyard have higher temperatures using thermometers. Based on their results, students hypothesise how concentrations of surfaces that absorb heat might affect the temperature in cities - the urban heat island effect.

### Data Collection Student Worksheet

This worksheet from UCAR Centre for Science Education can be used to collect data.

## Further Viewing

### Big Weather (and How to Survive it)

This video series from the ABC discusses big weather events and their impact on communities across Australia. The series is suitable for Science and Geography students in Years 5-10.

# BENEFITS OF URBAN STREET TREES

## Life is Not Still – Activity - Cool Australia

### Life is Not Still

This activity invites students to become observers of their natural environment and encourages a connection between humans and nature. Designed for Years 3-5 students, the Life is Not Still activity includes worksheets and lesson plans.

Council has adapted this activity for prior community engagement events. A copy of the [worksheet](#) is provided at the end of the document for your convenience.

## Leaf Man – Online Story + Activity – Cool Australia

### Leaf Man: Read Aloud

Designed for Stage 1 (ages 5-7), “Leaf Man” is a good afternoon learning activity to stimulate creative thinking. Students can relax as they listen to the story “Leaf Man” by Lois Ehlert and reflect on the role and importance of trees.

### Leaf Man’s Adventure (Activity)

Leaf Man’s Adventure includes worksheets and lesson plans.

# ADDITIONAL RESOURCES

## Sustainable Futures - CSIRO

### Sustainable Futures

CSIRO offers a catalogue of teaching resources relating to sustainability and the environment. You can read more about their STEM guided lesson plans and register your school for the Sustainable Futures Program.

### Climate Council Report: The Silent Killer: Climate Change and the Health Impacts of Extreme Heat

This complex research paper provides an in-depth analysis of the health impacts caused by extreme heat in Australia.

### Western Sydney University Cool Schools Research Report

A two-part research report that discusses heat in schools. The paper documents the heat in the classroom and its effect on children's ability to learn, and summarises current research in health and environmental sciences, planning policy, legislation and standards, sustainability education, and innovative design trends to improve thermal comfort in education environments.

## WANT TO PLANT TREES AT YOUR SCHOOL?

Some organisations offer tree planting programs designed specifically for schools, providing a great "hands-on" opportunity for students who may not otherwise have the means or ability to get into nature and experience tree planting at home.

## Planet Ark – Tree Day

### National Tree Day

While National Tree Day for schools occurs once a year, can register for a tree day event at any time.

Planet Ark has also provided downloadable PDFs with simple activity ideas that relate to trees and the environment.

## Greening Australia – Cooling the Schools

### Cooling the Schools

Greening Australia encourages connecting children with nature and offers a tree planting day with curriculum-linked lessons delivered by Greening Australia education and field staff.

## STUDENT WORKSHOP

NAME: \_\_\_\_\_

CLASS: \_\_\_\_\_

### ADOPT A TREE DATA COLLECTION

Trees play a vital role in creating a cooler and more sustainable environment for the community. They provide an enormous range of benefits for people and animals by creating a canopy that produces shade, creating cooler spaces for us to play and work, and protects us from harmful UV rays. They also help to clean the air we breathe and purify our waterway by cleaning out pollutants through their leaves and roots. Trees are especially important to our survival.

Have you ever climbed a tree? Have you ever sat under a big tree to enjoy a picnic with your family or read a book? We interact with trees in many ways and so do animals. Trees provide habitat (or homes) for animals like birds and possums, and food for insects such as bees and caterpillars.

This worksheet is designed to help you observe the way humans and animals interact with trees in your area over a period of time. Find a tree in your backyard, at your local park or at your school and use the prompts below to document your findings.

**WHAT DATE ARE YOU GOING TO START WATCHING YOUR TREE?**

\_\_\_\_\_

**WHERE IS THE LOCATION OF THE TREE?**

\_\_\_\_\_

**WHAT TYPE OF TREE IS IT?**

\_\_\_\_\_

**HOW HEALTHY IS THE TREE? WHAT DOES IT LOOK LIKE? ARE THE LEAVES GREEN OR BROWN? DOES IT LOOK LIKE AN INSECT HAS BEEN EATING IT?**

\_\_\_\_\_

\_\_\_\_\_

For more information on how you can help our environment, or to make some suggestions of your own, please go to [www.coolaustralia.org](http://www.coolaustralia.org)

©2021 Cool Australia

**PENRITH**  
CITY COUNCIL



# WHAT DID YOU SEE?

Watch the tree over the next four weeks and record what you see...

What did you see?	First week	Second week	Third week	Fourth week
Did it rain? (Yes/no)				
Was it windy? (Yes/no)				
Was it sunny? (Yes/no)				
Was it hot? (Yes/no)				
What plants are around the tree?				
How many animals have you spotted near the tree?				
How many animals have you spotted on the tree?				
How many birds did you spot on the tree?				
How many insects did you see on the tree?				
What other animals did you see?				
How many people can you see sitting around the tree?				

For more information on how you can help our environment, or to make some suggestions of your own, please go to [www.coolaustralia.org](http://www.coolaustralia.org)

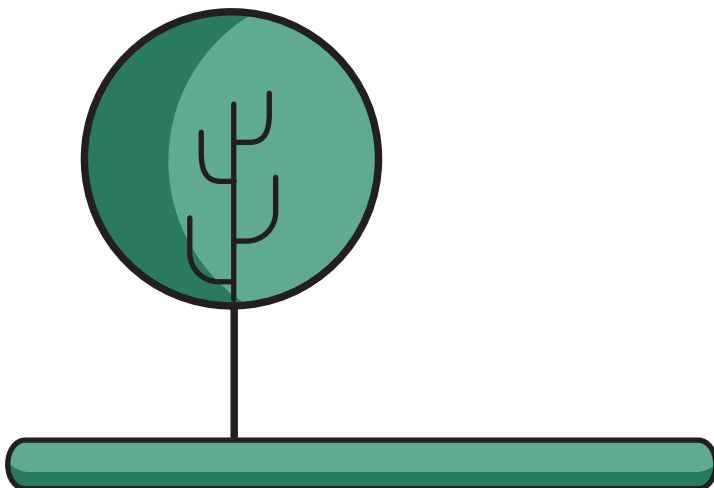
©2021 Cool Australia



# TREE INTERACTION DIAGRAM

In the middle of a large sheet of paper, draw an illustration of your tree.

1. Show on the illustration how our environment interacts with the tree. What is the effect of the sun and weather?
2. Show where animals live, feed or rest in the tree and list anything the animal was doing at the time.
3. At the bottom of your illustration write:
  - How the tree may help people.
  - How people might affect the tree.



For more information on how you can help our environment, or to make some suggestions of your own, please go to [www.coolaustralia.org](http://www.coolaustralia.org)

©2021 Cool Australia

**PENRITH**  
CITY COUNCIL

