Climate Action Schools: School Activity #1

Our Climate Action School Keystone Species

Overview

Each Climate Action School will work to research, identify, and visually represent a native tree or plant to be showcased as the school Keystone Species. The Keystone Species will be used as an identity marker and teaching device with the other global schools. Connections will be made to climate science, personal identity, and school culture.

Activity Timeline: December - January 2025

Materials

- Resources for research
- Tools for creating school avatar

Process and Intentions

1. Explore through research
2. Come together through consensus
3. Celebrate your School Keystone Species
4. Create your School Avatar
5. Establish connections

Key Terms

Climate Change: long term shifts in temperature and weather patterns caused by natural variations in solar cycles and more recently by human activities that either produce greenhouse emissions or reduce the trapped gasses, including:

- power generation
- manufacturing of goods
- cutting down forests
- using transportation
- producing food
- unsustainable consumption

Keystone Species: a species within a community whose role goes far beyond its placement in the food web or trophic level it occupies. In a way, it holds the ecosystem together. The name keystone refers to the center stone that supports an arch. Thus if removed, the arch collapses. Similarly, if the keystone species within a system is removed or impacted, the community could collapse.

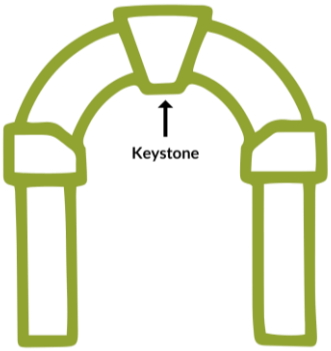
Trophic Cascade: the trickle down effects and connectedness of different trophic levels within an ecosystem; similar concept to keystone species with reciprocal effects that alter abundance or productivity of a trophic level.

Pause & Notice

Instructional note: *Invite students to learn about keystone species and explore examples. Consider drawing an arch to assist in explaining the term "keystone."*

What is a keystone?

To begin, let's consider the term "keystone." In building and design, an arch is a supportive structure. The keystone (or capstone) is the most important stone that keeps the structure intact. It locks the structure and the individual pieces into place, and without this critical piece, an arch would collapse.



What is a keystone species?

A **keystone species** is a species within a community whose role goes far beyond its placement in the food web or trophic level it occupies. In a way, it holds the ecosystem together. Similar to a keystone within an arch structure, if the keystone species within a system is removed or impacted, the community could collapse. Keystone native plants can provide food and shelter for animals and are critical to maintaining local biodiversity. A keystone plant is determined by the number of species it supports. PC: Pixabay.

What are some examples of keystone species?

Keystone species can be animals or plants. Some examples of keystone species include ecosystem engineers such as beavers or apex predators like wolves. Here are some other examples:

- Sea otters consume sea urchins which can destroy kelp forests.
- Mangrove trees provide coastal habitat and storm and flood protection. They absorb and sequester tremendous amounts of atmospheric carbon.
- Oak trees support insect biodiversity.
- Sunflowers have vertical growth and support bees and caterpillars.

PC: Pixabay, Pixabay

Videos for exploring:

- How Beavers Engineer the Land
- How Wolves Changed Rivers

- How Whales Change Climate

Keystone Species: Connections to Climate Change

Keystone native plants play a critical role in ecosystems and are directly connected to maintaining biodiversity. The complex interactions between species and their environment create the framework for Earth's life support systems which the biosphere depends on for its survival. These vital ecosystem services, such as carbon absorption and fixation, the production of oxygen gas, the regulation of the water cycle, and soil production, are all directly connected to Earth's climate.

Mangrove forests, which occur in tropical regions world wide, are known to be one of the most productive ecosystems on the planet. They actually produce so much biomass, that they export nutrients to neighboring systems in a process known as *outwelling*. This tremendous productivity of mangroves removes and fixes tons of atmospheric carbon, playing a vital role in climate regulation.

Video for exploring:

- Mangroves: How they help the Ocean

Check for understanding:

As a final step for this phase, your school community will want to be able to answer the question: **What does it mean if a plant or a tree is called a keystone species?**

Explore Possibilities

Instructional note: *Invite students to make local connections by researching and identifying local native trees and plants. The objective will be to narrow down to one final keystone native plant or tree to represent your school.*

What local trees or plants play a key role in your environment?

Use research tools to assist in your discovery process. Invite students to narrow their selections to one keystone species they believe best represents your local area and your school.

Research tools and resources may include:

- web searches with trusted sources
- books from school or local library
- interviews with local tree/plant experts
- presentation by local environmental experts/community partner

Invite students in your school to research and then submit their top picks.

1. Name of keystone native plant/tree
2. Local benefits
3. Connection to climate change
4. Meaningful connection to school

As a school, you can decide how you would like students to submit their ideas. Options may include:

- submit via online form
- present ideas individually or in small groups
- add ideas to a school community board (hallway bulletin board, virtual space)

Together, narrow down ideas to your Top 3 and then as a school come together through consensus to select your final choice for your representative keystone species.

Check for understanding:

As a final step for this phase, your school community will want to be able to answer the question: **Our Climate Action School keystone species is a _____.**

Design with Optimism

Instructional note: *Invite students to work together to create one image (avatar) representative of your keystone species, your school, and your location.*

Congratulations on selecting your Climate Action School Keystone Species! We cannot wait to learn what it is and how all our keystone native plants from all the global

schools connect together. Your school now can create their Climate Action School Avatar.

A digital avatar is a 2D image or icon that denotes identity. They can be used in community profiles and as an identity marker. All Climate Action Schools will introduce themselves in January with their digital avatar. Creativity encouraged!

Examples:

Prepare:

1. Invite students to note information to be included in the digital avatar:
    - drawing or image and name of keystone native plant

- school name
- school colors, emblems, designs
- location including local area and country

2. Invite students to design sample avatars using digital or analog tools.
    - digital art tools (e.g. Adobe Logo Maker, Express, Canva, AutoDraw)
    - art supplies/ nature items

3. Finalize your selection for your final digital avatar image. Share your design with your community members as you announce your school as a Climate Action School. Some ideas: share avatar and experience in your school newsletter, invite students to write poems/stories about your keystone species, calculate carbon each keystone species offsets in one year.

Checks for understanding:

Questions to Consider as a Community

- What makes our native tree or plant resilient?
- What makes our school resilient? What makes you resilient?
- What aspects of our digital avatar represent our school community and local community?
- How might our digital avatar serve as an identity marker and teaching device for others to learn about us? Our keystone species? Our local community?

Collective Action

You are now set with your Climate Action School Keystone Species and Digital Avatar. Add your avatar onto our Climate Action Schools Slidedeck and Climate Action Schools Map to introduce yourself. Here is the information you will need for the virtual introduction:

Item	Description
Digital Avatar	image file prepared for sharing **be sure you have permissions for all images*
School Name	your school name
School Location	local area, country
School Community	1 sentence description of your school community
Keystone Native Plant	name of keystone species native tree or plant
Climate Connection	1 sentence description on native plant and connection to climate change
OPTIONAL: Intro video	create a 2-3 minute video introducing your school

EXAMPLE	
Item	Description
Digital Avatar	

School Name	Odesa Primary School
School Location	Ukraine
School Community	Public school located in the city center with 250 students ages 5-14.
Keystone Native Plant	Sunflowers
Climate Connection	Sunflowers absorb radiation and are resilient, resistant to drought, and important for bees.

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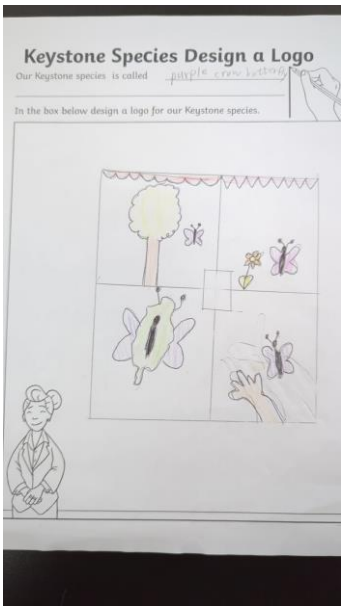
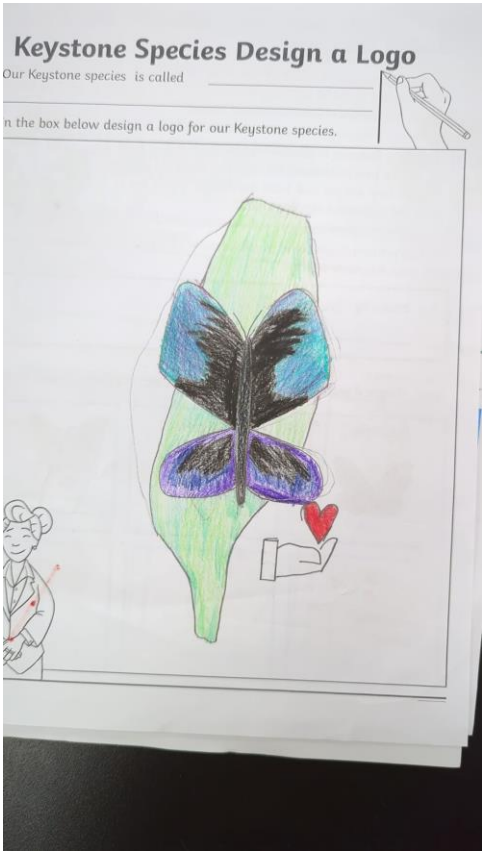
Our Climate Action School Keystone Species	
Digital Avatar	
School Name	

School Location	
School Community	
Keystone Native Plant	
Climate Connection	
Optional: Intro Video	

Examples from the Classroom (via Rony Antony, Taiwan)



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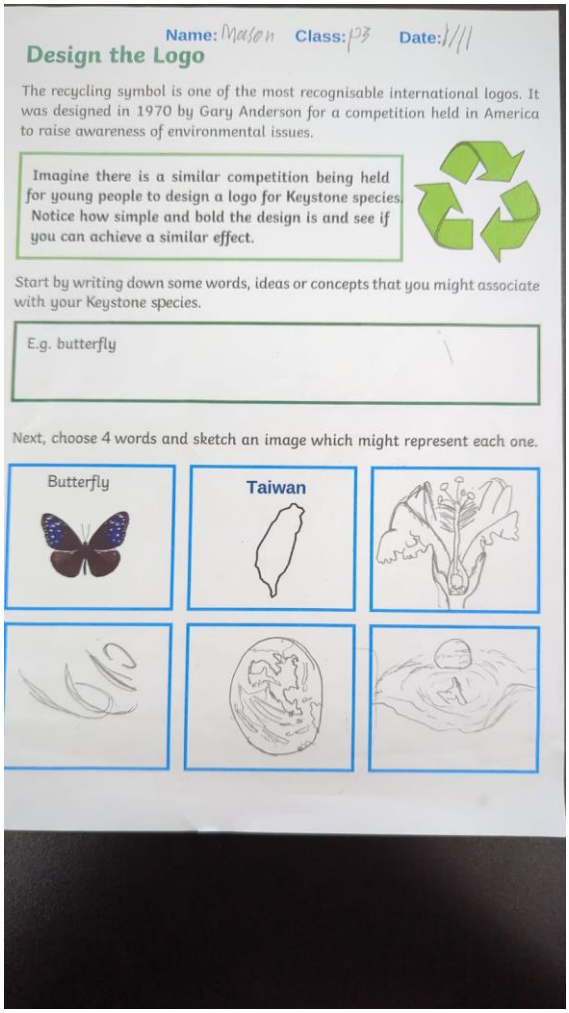

Name: Mason Class: P3 Date: 1/11

Design the Logo

The recycling symbol is one of the most recognisable international logos. It was designed in 1970 by Gary Anderson for a competition held in America to raise awareness of environmental issues.

Imagine there is a similar competition being held for young people to design a logo for Keystone species. Notice how simple and bold the design is and see if you can achieve a similar effect.

Start by writing down some words, ideas or concepts that you might associate with your Keystone species.

E.g. butterfly

Next, choose 4 words and sketch an image which might represent each one.

Butterfly

Taiwan