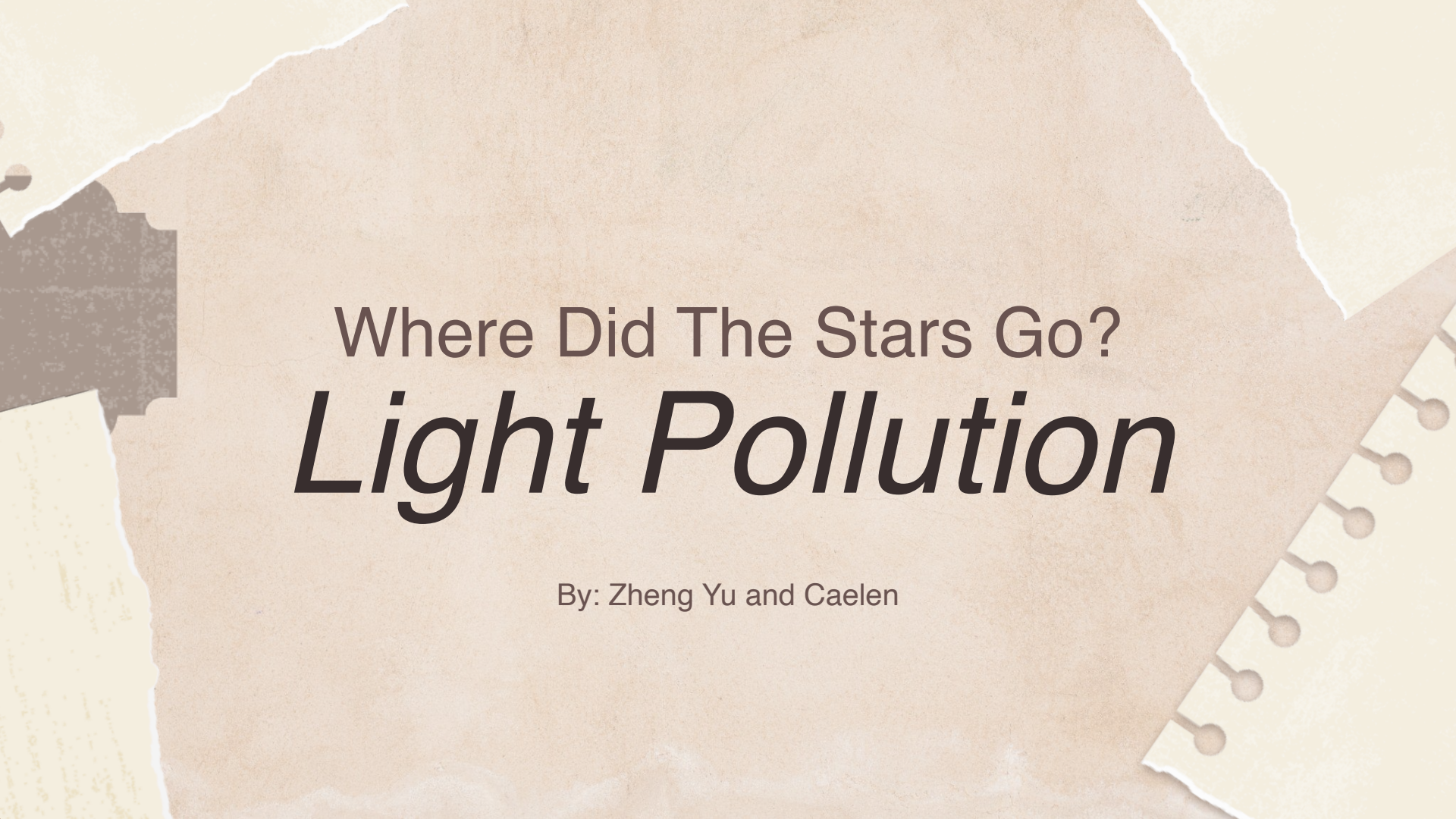


The background features a collage of torn, aged paper in shades of beige and cream. On the right side, a spiral-bound notebook is visible, with its metal spiral binding and lined pages peeking out from under the paper layers. The overall aesthetic is that of a vintage or handmade project.

Where Did The Stars Go? *Light Pollution*

By: Zheng Yu and Caelen

Introduction to *LIGHTS OUT*

Our goal is to teach Middle School Students:

1. Astronomy
2. Light Pollution
3. Ways of measuring Light Pollution



Why choose these topics

For students to study?

We want to evoke:

1. Emotional Hook
2. Sense of Loss
3. Built-in creativity`

By Teaching Constellations Through:

1. Interactive storytelling
2. Build Own Constellation
3. In class challenge

Astronomy

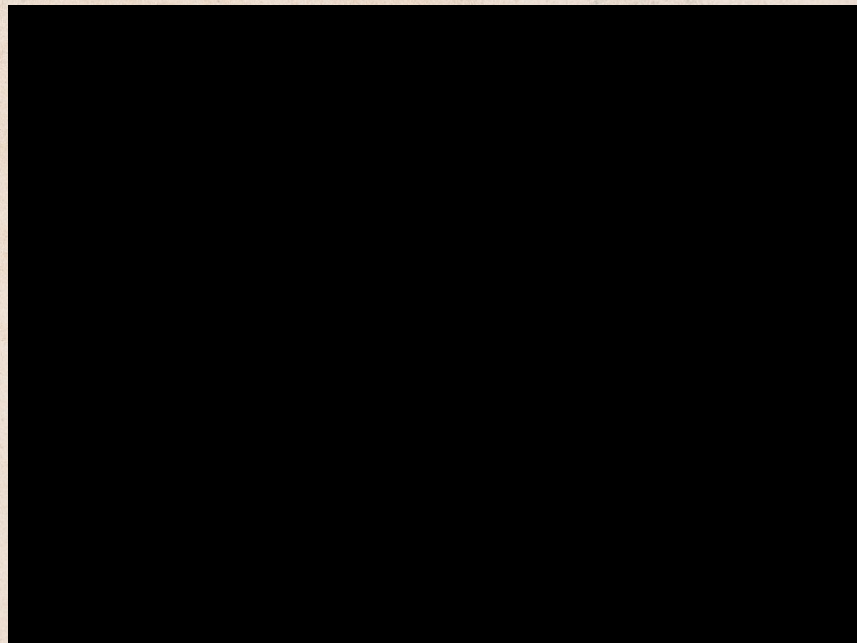
Lessons on the constellation tales of fallen hero

Example.

Constellation

Orion, a legendary hunter, claimed he could kill all animals on Earth.

Angered, Gaia sent the giant scorpion Scorpius to stop him. After a fierce battle, Scorpius stung Orion, killing him. Artemis, the goddess of the moon and Orion's secret admirer, transformed both Orion and the scorpion into constellations. To keep them apart, the gods placed them on opposite sides of the sky when one rises, the other sets.



Research Question

1. How does integrating mythology into astronomy lessons affect student interest and memory retention?
2. How does artificial light impact visibility of constellations in a simulated night sky?

Method

In class visualization of the constellation they just learned.

Research Question

Analysis and Result

1. Student Understanding of Light Pollution Improved
2. Constellation Activity Sparked Engagement
3. Hands-On Learning Boosted Concept Retention



02

Lesson Plan

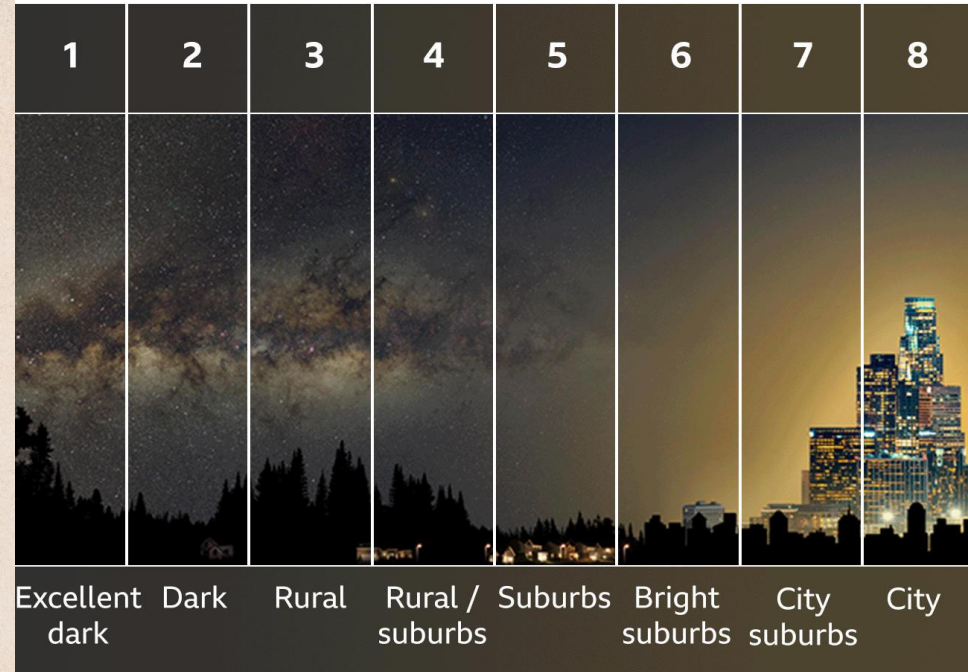
Light pollution and how we measure it

What are we going to teach?

1. Skyglow and why we can't see the constellations
1. How to measure light pollution
1. Effects on wildlife

This will all be used in the inclass activity.

Skyglow: How light pollution varies



Source: Kyba et al. Science

B B C

Bortle Scale

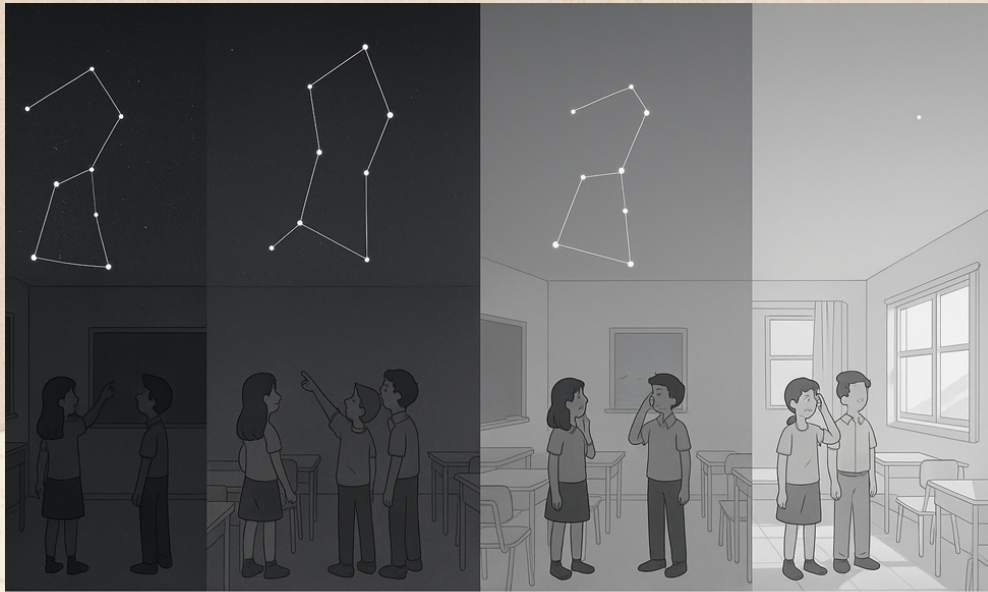


03

Activities

FUN!

What activities *will be included?*



1 Dark Sky

2 Dim Sky

3 Brighter Sky

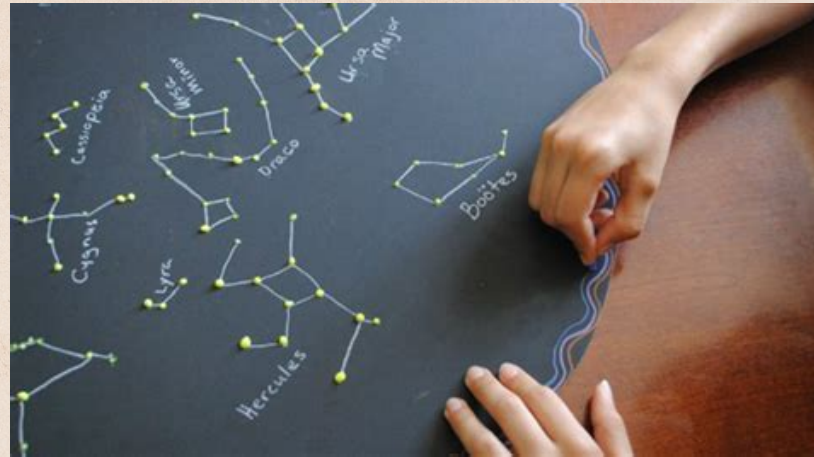
4 Bright Sky

1. *Darken the room and project the night sky/constellation.*
1. *Volunteering students try to spot a constellation.*
1. *Gradually add light (curtains, lamps) to show how visibility fades with light pollution.*

What activities *will be included?*

Students will design their own constellations or artworks in a take-home box activity. Using flashlights, we'll project their creations in class for an interactive constellation showcase.

(Make sure to shine on tables instead of ceiling)



Research Question

1. What role does hands-on activity play in student engagement and comprehension?
1. What changes in student understanding of light pollution occur before and after the simulation?

Analysis and Result

Students find hands on activity to be more engaging and effective.

Students understand the reasoning for light pollution and the problems it causes

All Research *Questions*

How does artificial light impact visibility of constellations in a simulated night sky?

What changes in student understanding of light pollution occur before and after the simulation?

How does integrating mythology into astronomy lessons affect student interest and memory retention?

What role does hands-on activity (planetarium-in-a-box) play in student engagement and comprehension?

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