Learning Activity

Tree : Tender Lesson

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Abstract:
Students will have previously done an activity with Land use's around their neighborhood and compare maps created by their peers prior to watching tree tender. Categories for land uses will be constructed by each group.   Students will create a class mural on long sheet of paper and incorporated ecosystems services . Groups will be assembled per categories ex: parks and recreation, power and waste water treatment plants, how to deal with trash etc. visual representations on small pieces of papers and select areas to "place" their land use on the class mural. As each group attaches their specific land use members will explain the pros and cons of choosing specific sites. A lottery system will be devised so first come first serve.
An extension of this will be to explore the term ecosystem services.

Learning objectives:

- **Land uses** around your current neighborhood. For hw make /draw a map and label land uses (human and ecosystems)

- As a class draw a natural environment mural with a live ecosystem

- In small groups design and locate various land uses

- As an individual construct a list of environmental benefits & costs to the environment and for the humans as each groups places their land use(s) on the mural

- Brainstorm with peers by drawing pics / list examples of **Ecosystem Services**
- Use the internet research and add to your list
- Objectives after watching **Tree tender video** (15 min)
    - Use **wordle and word cloud** to construct major concepts individual student gained from the video
    - Compare wordless and discuss why certain words were chose and defend and explain the connection to tree tender
    - Ponder "healthy " new habits to develop to be a hero to save a _____????planet/species etc
    - *Cladogram handouts next……………………*

    - Tree of life & DNA

Timeframe:
Land use mural 1. 5 days

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Ecosystem Services 1 day

Tree Tender & wordless 1 day

Hw: healthy new planet habit year long check in and categorize into :

Intro Cladogram handouts …….Tree of Life genetics ….see next

List of materials:
Computers, mural long paper, scissors, colored paper , tape, colored pencils, tape , internet access, print wordless (or save)

Procedure and general instructions (for instructor). REQUIRED.

- Divide students into groups of 6 based on land use
- Have students list types of services desired in their community as a class and assign categories per land use :ex: roads and transportation, recreation,
- Give students time to design and draw a pictorial to represent their land use.
    - As students choose location topics of how humans change the natural environment cost and benefits should be listed on paper.

Procedure and general instructions (for students).

Students need to consider the type of ecosystem desirable to have as a class. As a group students need to organize and create desirable habitats for the local fauna and flora as well as desirable for homo sapiens

List of possible land use services to include

Biological Control (Pests/Diseases), recreation, power, water, waste treatment, human geography (housing etc) , regional economics (how to make a living for families living in the community

Assessment Questions
- As students hear and listen to the selection of services and the location of these services have individual students keep a record of human costs and benefits and environmental costs and benefits. How
- Does it only affect us? What other organisms are affected by the loss of biodiversity?
- What do you think might happen if we lose too many species and too many services?
- What is one thing you can do to help?
- What is one thing your community can do to help?

Reference list
TreeTender. (2017). Retrieved May 9, 2018, from https://www.treetender.org

Learning Activity

Sample wordless , word cloud and poster with a message
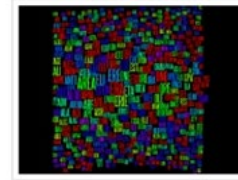
Submit healthy habit hw and classify into one of these categories.

Environmental Societal Problems

‣ Loss of biodiversity
‣ Climate change
‣ Emerging pathogens
‣ Loss of pollinators
‣ Invasive species
‣ Threats to food security
‣ Environmentally induced health issues

How can you be a superhero
Develop a healthy habit
To help

Solving these biodiversity-centered problems
requires concentrated attention
from diverse perspectives

Original Document: Cladogram Analysis
What is a cladogram? It is a diagram that depicts evolutionary relationships among groups. It is based on **PHYLOGENY**, which is the study of evolutionary relationships. Sometimes a cladogram is called a phylogenetic tree (though technically, there are minor differences between the two).
In the past, biologists would group organisms based solely on their physical appearance. Today, with the advances in genetics and biochemistry, biologists can look more closely at individuals to discover their pattern of evolution, and group them accordingly - this strategy is called **EVOLUTIONARY CLASSIFICATION**
CLADISTICS is form of analysis that looks at features of organisms that are considered "innovations", or newer features that serve some kind of purpose. (Think about what the word "innovation" means in regular language.) These characteristics appear in later organisms but not earlier ones and are called **DERIVED CHARACTERS**.
PART I - Analyze the Cladogram
Examine the sample cladogram, each letter on the diagram points to a derived character, or something different (or newer) than what was seen in previous groups. Match the letter to its character. *Note: this cladogram was created for simplicity and understanding, it does not represent the established phylogeny for insects and their relatives.*
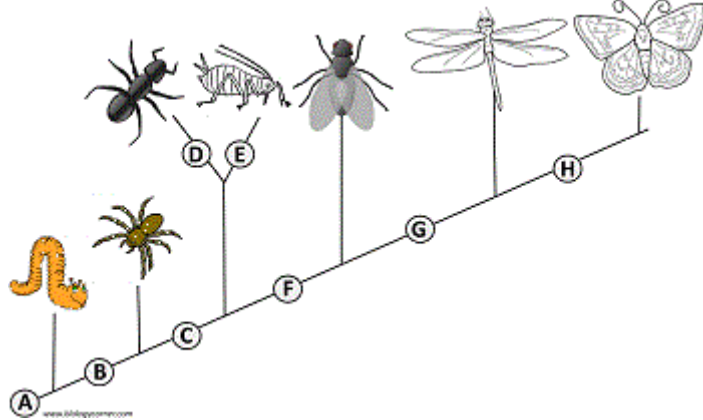
1. __F___ Wings
2. ___C__ 6 Legs
3. ___A___ Segmented Body
4. ___G__ Double set of wings
5. __E___ Cerci (abdomenal appendages)
6. ___D__ Crushing mouthparts
7. ___B___ Legs
8. __H__ Curly Antennae

PART II - Create Your Own Cladogram
To make a cladogram, you must first look at the animals you are studying and establish characteristics that they share and ones that are unique to each group. For the animals on the table, indicate whether the characteristic is present or not. Based on that chart, create a cladogram like the one pictured above.

	Cells	Backbone	Legs	Hair	Opposable Thumbs
Slug	Y				
Catfish	Y	Y			
Frog	Y	Y	Y		
Tiger	Y	Y	Y	Y	
Human	Y	Y	Y	Y	Y

DRAWING OF YOUR CLADOGRAM

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