Lesson Plan for Grades: 6-8   **Length of Lesson: 65 minutes**
Authored by: UT Environmental Science Institute   **Date created:**

Subject area/course:
 ● Science
     o Biology
     o Palentology

Materials: ● Sorting cards   ● Blank sheets of paper
TEKS/SEs: ● Use the following format: **§112.27. Grade 7**   (4) Organisms and environments. Students further their understanding of organisms as systems made up of cells organized into tissues, tissues into organs, and organs into organ systems by identifying the main functions of the organs within the human body. During both sexual and asexual reproduction, traits are passed on to the next generation. Students understand how traits in populations can change through the processes of natural and artificial selection. Students analyze how energy flows through trophic levels and how biodiversity impacts an ecosystem's sustainability. Students gain an understanding of the taxonomic classifications of organisms and how characteristics determine their classification
Lesson objective(s):   ● Student will be able to identify traits of ancient species by analyzing the traits of current relatives of that species   ● Students will be able analyze a phylogenetic tree
Differentiation strategies to meet diverse learner needs: ● ELL students and students with learning disabilities should have multiple forms of instruction including visual and written instruction sheets, sentence stems as well as a verbal instruction and demonstration.

ENGAGEMENT (20 minutes)
 ● The teacher will open the Dinosaurs ROAR slide 🗔 Dinosaurs ROAR lesson plan slide 2: ask students the following questions in a think-write-pair-share
     o Who do you look most like? Why do you think that is?
     o Who are you most closely related to in the family tree?
 ● Slide 3: teacher leads class discussion
     o Who are you more similar to, a dog or your next door neighbor?
     o What about an ape? Are you more like an ape or a dog?
     o How can you tell?
     o Create a class venn diagram: What traits to apes and dogs have in common?(slide 4)
 ● (slide 5) Students will then be introduced to the idea of phylogenetic trees.
     o Species on a phylogenetic tree are grouped together based on shared features
     o Phylogenetic trees are similar to family trees and they are read in the same way. The root of the tree is the ancestral lineage (like your grandparents) and the tips of the branches are the descendents of that ancestor (you and your cousins)

o Creatures who share a more recent ancestor tend to be more similar to each other than those who share a distant ancestor. (You are likely more like your sister than your cousin)
● After showing the simplified phylogenetic tree the teacher should move onto slide 6 to show a another representation.

EXPLORATION (15 minutes)
● (slide 7) In groups of 2-4 students make their own phylogenetic tree using the card sort
  ○ The students will be given a set of sorting cards and some blank sheets of paper.
  ○ Students copy the blank phylogenetic tree from the slides and sort the cards into the tree based on similarities of the organisms.
  ○ Guiding questions:
    ■ Which species is more genetically similar to humans?
    ■ What sort of traits do these organisms share?
    ■ Is a species two branches away more or less genetically similar to humans than one that is only one branch away?
● If a group finishes early then they can be given the bonus cards to expand their phylogenetic tree.
  ○ These cards require students to draw more branches on their tree rather than copy another empty tree

EXPLANATION (15 minutes)
- After the activity the teacher should go through slide 8 in a large class discussion.
- Students think pair share to discuss what traits these organisms have in common and what that may mean for their evolutionary relationships
- Next move on to slide 9 and play the linked Kahoot with the class.

ELABORATION (15 minutes)
- **If lesson goes to long these activities can be shortened**
● The teacher should move to slide 10
  ○ What did dinosaurs sound like?
  ○ How do you know?
  ○ Can you replicate it?
● (slide 11) scientists are still trying to determine how dinosaurs used to sound.
  ○ The teacher will play audio of the sounds common ancestors of dinosaurs make
  ○ The students will make note of the features of each sound in their notebooks or a sheet of paper.
● After listening to all the sounds the class will make a short list of things they noticed about how the creatures produced the sound. If the class is struggling, consider giving them the following guidelines:
  ○ What did the animals do when they made the sounds?
  ○ What types of sounds were made, Growls? Chirps? Barks?
  ○ Were the sounds made with the animals mouth open or closed?
● Students will then be given a few minutes in small groups to try and come up with their best guess as to what a dinosaur sounded like.
  ○ If the students would like, this may involve attempting to mimic that noise.
● During this the teacher should be walking around observing and aiding each group using the following questions
  ○ How might size impact sound?
  ○ How realistic is the dinosaur roar found in movies?
● Lastly the teacher will move to the last slide and play a small clip from the presentation.
● At the end of the lesson the students will be given a small exit ticket to fill out on slide 15

EVALUATION (throughout entire lesson)
- Methods in lesson
  - Kahoot
  - think-pair-shares
  - card sort
- Students answer exit ticket questions on notebook paper

SOURCES AND RESOURCES
- **Dr Julia Clarke *Hot Science – Cool Talks #125,* "A dinosaurs roar",**
  whttps://www.seattleschools.org/wp-content/uploads/2022/03/AVID_Instructional_Strats.pdf
- https://vertlife.org/data/mammals/

Sorting activity cards: Cut before lesson

Platypus
Genetic Similarity to humans: 40%
Closest relative: Echidna

Gorilla
Genetic Similarity to humans: 95 %
Closest relative: Homosapian

Hedgehog
Genetic Similarity to humans: 60 %
Closest relative: Hyena

Fox
Genetic Similarity to humans: 72%
Closest relative: Panda

Hyena
Genetic Similarity to humans: 75%
Closest relative: Ocelot

Advanced Cards

Ocelot
Genetic Similarity to humans: 72%

Panda
Genetic Similarity to humans: 70%
Closest relative: Fox

Echidna
Genetic Similarity to humans: 38%
Closest relative: Platypus

Advanced cards guide: Each of these species branched off of other branches. Draw extra branches on your phylogenetic tree to sort these cards

RUBRIC FOR ASSESSMENT

Category	1	2	3	4
Kahoot	Student got 0 questions correct	Student got 1-2 questions correct	Student got 3 questions correct	Student got 4-5 questions correct
Phylogenetic tree activity	Student did not participate in the activity	Student participated in the activity with their group Group did not complete the activity	Student participated in the activity with their group Group completed the activity	Student participated in the activity with their group Group accurately completed the activity.
Exit Ticket	Student did not answer the questions	Student answered both questions incorrectly	Student answered 1 question correctly	Student answered both questions correctly