Lab: Biome Match

(created by C. Rush with inspiration from Go Fish & NatGeo)

Background: Biomes are regions with characteristic types of natural, undisturbed ecological communities adapted to the climate of the region. Biomes are sometimes confused with similar ecological concepts, such as habitats and ecosystems. Ecosystems are the interactions between biota, such as plants and animals, within the environment, and many ecosystems can make up a single biome. Nutrient and energy flow also play a critical role in ecosystems. A habitat, on the other hand, is specific to a population or species; it is the area in which that group lives. Meanwhile, biomes describe life on a much larger scale than either habitats or ecosystems. The term “biome” was first used in 1916 by Frederic E. Clements, an American ecologist, to describe the plants and animals in a given habitat. In 1939, it was further defined by Clements and fellow ecologist Victor Shelford. Over time scientists continued to expand and refine the definition of biome and related concepts in the burgeoning field of ecology, and in 1963, Shelford characterized the following biomes: tundra, coniferous forest, deciduous forest, grassland, and desert. Later, ecologist Arthur Tansley created a separate definition for ecosystems, which was more inclusive of biological processes than the definition of a biome. What unites all biome definitions is that biomes can be differentiated by the organisms residing there and by the climate, as well as the fact that the organisms within a biome share adaptations for that particular environment. Climate is a major factor in determining types of life that reside in a particular biome, and there are several factors that influence climate, such as latitude, geographic features, and atmospheric processes disseminating heat and moisture. (National Geographic, 2022)

Prelab Questions:

1. Define Biome.

2. How is an ecosystem different from a biome?

3. Who first coined the term “biome”?

4. Describe how the biome of a particular region is determined.

5. How does the classification of an aquatic biome differ from that of a terrestrial biome? (not given)

Procedure: This game plays like Go Fish! The goal is to win the most "biome sets". A biome set consists of a name card, characteristics card, climatograph/examples card and an organisms card.

a. Any player deals one card face up to each player. The player with the lowest card is the dealer. The dealer shuffles the cards, and the player to the right cuts them.
b. The dealer completes the cut and deals the cards clockwise one at a time, face down, beginning with the player to the left. If two or three people are playing, each player receives seven cards. If four or five people are playing, each receives five cards. The remainder of the pack is placed face down on the table to form the stock.
c. The player to the left of the dealer looks directly at any opponent and says, for example, "Do you have 4♦ - lynx, moose & horned owl?" The player who is "fishing “must have at least one card of the biome type that was asked for in their hand (to the best of their knowledge). The player who is addressed must hand over the card requested. If the player has none, they say, "Go Fish!" and the player who made the request draws the top card of the stock and places it in their hand.
d. If a player gets the named card that was asked for, they are entitled to ask the same or another player for another card. The player can ask for the same card or a different one. So long as the player succeeds in getting cards (makes a catch), their turn continues. When a player makes a catch, they must reveal the card so that the catch is verified. If a player gets the fourth card of a book, the player shows all four cards, places them on the table face up in front of everyone, and plays again.
e. If the player goes fishing without "making a catch" (does not receive a card they asked for), the turn passes to the left.
f. During the game, if a player is left without cards, they may (when it's their turn to play), draw from the stock and then ask for cards of that rank. If there are no cards left in the stock, they are out of the game.
g. The game ends when all thirteen sets have been claimed. The winner is the player with the most correctly identified sets..
h. VERIFY that all sets are correct with Mr. Rush/Ms. Magee before determining a winner and recording your final information.

Use the following card information to identify biomes and their potential matches. Each biome consists of four cards: a name card, a characteristics card, a climatograph/examples card and an organisms card. The card suits/numbers are random and NOT in the correct order (wouldn’t want to make things too easy… it IS an AP class 😉)

BIOMES
A♥Taiga (Boreal Forest)
2♥Temperate Deciduous Forest
3♥Tropical Rainforest
4♥Chaparral
5♥Temperate Grassland
6♥Savanna
7♥Desert
8♥Tundra
9♥Coral Reef
10♥Estuary
J♥Coastal Wetland
Q♥Stream/River
K♥Lake/Pond

ORGANISMS
A♦painted turtle, leopard frog, carp
2♦kangaroo rat, rattlesnake, scorpion
3♦sea anemone, clownfish, white tip shark
4♦ lynx, moose, horned owl
5♦otter, beaver, trout
6♦snowy owl, caribou, arctic fox
7♦toucan, sloth, howler monkey
8♦turkey, squirrel, black bear
9♦mangrove tree, raccoon, blue heron
10♦cheetah, giraffe, ostrich
J♦coyote, mountain lion, roadrunner
Q♦blue crab, oyster, flounder
K♦prairie dog, bison, grouse

CLIMATOGRAPH/EXAMPLES
A♠saltmarsh, mangrove swamp, pocosin
2♠Great Barrier, Miami Terrace, Chagos Archipelago
3♠Chesapeake Bay, Pamlico Sound, Geirangerfjord
4♠Baikal, Malawi, Superior
5♠Amazon, Mississippi, Nile
6♠graph1: hot/wet year round, even wetter summer
7♠graph2: warm/moist summers & cold/dry winters
8♠graph3: hot year round, distinct wet & dry seasons
9♠graph5: cold & colder seasons, low precipitation
10♠graph6: moderate temp, distinct wet/dry seasons
J♠graph7: moderate/seasonal temps, steady precip
Q♠graph8: strong seasons, warmer/wetter summer
K♠graph9: almost no precipitation, warm temps

CHARACTERISTICS
A♣Trees lose leaves in winter, four distinct seasons, high nutrient soils
2♣Tall, lush grass, also called veldt/pampas, deep, high nutrient soils
3♣Most biodiverse terrestrial biome, nutrient poor soil, highly stratified
4♣Most productive aquatic biome, mix of salt & freshwater
5♣Flowing freshwater, often starts in mountains
6♣Long, cold winters, nutrient poor soil, dominated by coniferous trees
7♣Most biodiverse aquatic biome, many symbiotic relationships
8♣Distinct wet and dry seasons, large herds of herbivores
9♣Lentic freshwater, often highly stratified
10♣Little rainfall, nutrient poor soil, sparse vegetation
J♣Halophytic plants, greatly influenced by tides
Q♣Very cold, mostly treeless with permafrost
K♣Dominated by hardy shrubs, high risk of fire, rocky soil

Double-Check!
Once all the cards sets have been identified, verify your results with Mr. Rush/Ms. Magee then record the correct information on the table to the right. (Feel free to abbreviate - this will be a good study document).

PostLab Questions:
6. Identify two biomes with nutrient rich soils.

7. Discuss the similarities that lead to high biodiversity in Coral Reefs and Tropical Rainforests. (not given)

8. Choose one biome and discuss similarities in the organisms found there. Why do these similarities occur?

9. Why is a climatograph a good way to determine what biome occurs in a particular area?

10. Which biome would you most like to visit and why?

Biome	Characteristics	Organisms	Graph/ Examples
Tiaga (Boreal Forest)			
Temperate Deciduous Forest			
Tropical Rainforest			
Chaparral			
Temperate Grassland			
Savanna			
Desert			
Tundra			
Coral Reef			
Estuary			
Coastal Wetland			
Stream River			
Lake Pond			