Station #1: Taxonomy

Examine the table showing the classification of four organisms. The answer the questions.

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Green Frog</th>
<th>Mountain Lion</th>
<th>Domestic Dog</th>
<th>Human</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom</td>
<td>Animalia</td>
<td>Animalia</td>
<td>Animalia</td>
<td>Animalia</td>
</tr>
<tr>
<td>Phylum</td>
<td>Chordata</td>
<td>Chordata</td>
<td>Chordata</td>
<td>Chordata</td>
</tr>
<tr>
<td>Class</td>
<td>Amphibia</td>
<td>Mammalia</td>
<td>Mammalia</td>
<td>Mammalia</td>
</tr>
<tr>
<td>Order</td>
<td>Anura</td>
<td>Carnivora</td>
<td>Carnivora</td>
<td>Primates</td>
</tr>
<tr>
<td>Family</td>
<td>Ranidae</td>
<td>Felidae</td>
<td>Canidae</td>
<td>Homo</td>
</tr>
<tr>
<td>Genus</td>
<td>Rana</td>
<td>Felis</td>
<td>Canis</td>
<td>Homo</td>
</tr>
<tr>
<td>Species</td>
<td>Rana clamitans</td>
<td>Felis concolor</td>
<td>Canis familiaris</td>
<td>Homo sapiens</td>
</tr>
</tbody>
</table>

1. Which taxon includes the most specific characteristics? **Species**
2. Which taxon includes the broadest characteristics? **Kingdom**
3. Which taxon includes more species, an order or a family? **Order (it is a broader category)**
4. Which taxon includes only organisms that can successfully interbreed? **Species**
5. If two organisms belong to the same family, what other taxonomic groups do the organisms have in common?
   **Kingdom, Phylum, Class, Order**
6. Which two organisms in the chart are most closely related? Explain.
   **Mountain Lions and Domestic dogs. They are most related because they have more taxa in common.**
7. To which taxa do all four organisms belong?
   **Kingdom (they are all animals) and Phylum (they all have backbones)**
8. Which class does not include animals that have hair or fur? **Class Amphibia**
9. What is the order, family, and genus of a human?
   **Primates (order), Hominidea (family), Homo (genus)**
10. Using the information in the chart, what can you conclude about the classification taxa of an organism with the scientific name *Rana temporaria*?
    **Rana temporaria is most related to green frogs (Rana clamitans). I know this because they share the same Genus, which means they also share the same family, order, class, phylum, and kingdom.**
Station #2: Virus Lytic Cycle

1. Examine the 5 pictures at the bottom of this paper showing the stages of the lytic cycle. Cut out the 5 pictures and glue them into the blank boxes below in order from start to finish.

Answer the following questions after you have finished cutting and gluing the 5 pictures below.

2. In which stage does the virus attach to the receptor of a host cell? (1 2 3 4 5)
3. Which stage shows “Replication”? (1 2 3 4 5)
4. In which stage will new viruses look to find new host cells? (1 2 3 4 5)
5. Which stage shows “Release”? (1 2 3 4 5)
6. In which stage do the host cell’s ribosomes create virus proteins? (1 2 3 4 5)
7. Which stage shows “Assembly”? (1 2 3 4 5)
8. In which stage does the nucleic acid gain entrance into the host cell? (1 2 3 4 5)
9. Which stage shows “Attachment”? (1 2 3 4 5)
10. In which stage are virus proteins built into complete viruses? (1 2 3 4 5)
11. Which stage shows “Entry”? (1 2 3 4 5)

Play the video on the laptop computer titled “Virus Basics video clip” to answer the following questions. You may need to pause and rewind if needed. Video answers are not given. Watch the videos to find out for yourself.

12. How many sides often make up the polyhedral shapes of some viruses? ________________________
13. For rod shaped viruses, what makes up the inner core of these viruses? ________________________
14. Which type of cells do phage viruses attack? ________________________
15. What’s inside the capsid of phage viruses? ________________________
16. What’s attached to the sheath of phage viruses? ________________________

Open the video file titled “Star Wars Kid video clip.” Since the popularity of YouTube, “The Star Wars Kid” is a great example of a “Viral Video.” You can probably name several other “Viral Videos.” Why do you think these are called “viral” videos? Popular videos on YouTube are called “Viral videos” because they spread in much the same way that viruses spread. One person may watch the video and tell a dozen friends about the video. Those 12 people may each tell another dozen each (144 total) and those people tell others. Soon, the popularity of the virus has spread around the Internet.
Station #3 - Classification

Draw your cladogram:

There are too many possible ways to create a cladogram. Below is only one example. Yours may look different and still be correct.

Questions:

1. According to your cladogram, which traits do the iguana and the human have in common?
   
   Both have eyes, live on land, have 4 limbs

2. According to your cladogram, which trait was the latest to evolve?
   
   Horns

3. The genus and species of the banana spider are nephila (genus) and clavipes (species). Write the full name of the banana spider in proper scientific format.
   
   Nephila clavipes

4. What are the 3 methods by which organisms are classified today?
   
   Morphology, Embryo development, Biochemical
Station #4: Club Fungi

1. Using your mushroom along with the illustration and terms as a guide, draw (PENCIL) a diagram of your mushroom, label the parts of its anatomy that are present, and list your observations.
   Note: Many mushrooms may not have all of these parts—draw yours!

   a. cap—top part of mushroom
   b. scales—rough patches on cap surface
   c. gills—radically arranged flat surfaces on the underside of the cap
   d. ring—skirt of tissue circling stem
   e. stalk—main support of mushroom
   f. cup—at the base of the mushroom
   g. Examine the spore print, using a microscope/dissecting scope or magnifying lens if available.

   **Observations:** Observations should include look, texture, presence or absence of structures, and anything else you may have noticed.

2. Examine the spore print, using a microscope/dissecting scope or magnifying lens if available.
   Note: If the spores are light-colored, hold the paper at an angle toward the light to see them better.
   Explain below how a spore print could be obtained and how a spore print could be used.
   **Spore prints can be used to classify fungi.**

3. Observe both the cross section of the basidia under the light microscope, and the section of basidia (gills) under the dissecting scope. Choose one to draw your observations below. Be sure to use PENCIL, draw neatly and accurately, and LABEL your drawing.

   **Title:** Basidia

   **Drawings will vary but should be the very edge of the gill. I should see labels for basidia and spores.**

   **Total Magnification:** 100x
   **Description/Observations:** Descriptions should include color and appearance. Also, tell what spores are and what they do.
Station #4: Protista Station

Examine each specimen located at your lab table, but you only need to draw two samples of your choice. Draw them under the power that allows you to see them the best.

Samples:

1) Spirogyra is a genus of filamentous green algae of the order Zygnematales, named for the helical or spiral arrangement of the chloroplasts that is diagnostic of the genus. It is commonly found in freshwater areas, and there are more than 400 species of Spirogyra in the world.

2) Stentor, sometimes called trumpet animalcules, are a genus of filter-feeding, heterotrophic ciliate protists, representative of the heterotrichs. They are usually horn-shaped, and reaching lengths of 2 millimeters, they are among the biggest known unicellular organisms.

3) Mixed Protozoa: Like the name implies, these are random samples of animal-like Protozoa.

4) Diatoms are a major group of algae, and are one of the most common types of phytoplankton. Most diatoms are unicellular, although they can exist as colonies. Diatoms are producers within the food chain. A characteristic feature of diatom cells is that they are encased within a unique cell wall made of silica.

Name: _________________________   Name: _____________________________

Magnification: ____________________   Magnification: _______________________

Drawings, descriptions, and magnification will differ depending on specimens chosen. Please make sure you have included the title (name of specimen), total magnification, and LABELED your drawing (membrane, any organelle’s present, etc.)
Station #4: Virus Lysogenic Cycle

Open the video file titled “Lysogenic Cycle Video Clip” to answer the following questions. You may need to pause and rewind if needed. **Video answers are not given. Watch the videos to find out for yourself.**

11. Name the location of the surface of cells where the virus will attach. __________________________________________
12. What happens to the virus DNA once it enters the host cell? _______________________________________________
13. What is the combination of viral and host cell DNA called? _________________________________________________
14. What happens to the provirus when the cell divides? _______________________________________________________
15. What happens when the provirus eventually becomes active? ________________________________________________

Examine the 6 pictures of the lysogenic cycle

16. Which picture is unique to lysogenic viruses and not lytic viruses? 1 2 3 4 5 6
17. In which picture is a provirus created? 1 2 3 4 5 6
18. True or False: During the lysogenic cycle, usually only one infected cell will burst when the virus becomes active.
19. If 1 single cell becomes infected by a lysogenic virus and the subsequent cells divide a total of 8 more times, how many infected cells will be created? 512

20. Between which two pictures will the provirus remain dormant (for perhaps 10 years)?
   a. Between 1 and 2  c. Between 3 and 4  e. Between 5 and 6
   b. Between 2 and 3  d. Between 4 and 5  f. Between 6 and 1

21. Between which two pictures will the host cell multiply and divide by mitosis?
   a. Between 1 and 2  c. Between 3 and 4  e. Between 5 and 6
   b. Between 2 and 3  d. Between 4 and 5  f. Between 6 and 1

Open the video file titled “When Does HIV Become AIDS video clip” to answer the following questions. You may need to pause and rewind if needed. **Video answers are not given. Watch the videos to find out for yourself.**

1. In the USA, how many people will become infected with HIV this year? ________________________________
2. Below what amount of T-cells will a person become diagnosed with AIDS? ________________________________
3. What is the amount of T-cells that a healthy person has? ________________________________
4. What are two signs of AIDS? _________________________________________________________________
5. In general, what are illnesses that don’t usually occur in people with healthy immune systems? ________________
6. Which cancer occurs in lymphocytes (immune system cells)? ________________________________
7. Tuberculosis is a bacteria that infects which body part? ________________________________
8. What can CMV cause for people who also suffer from HIV? ________________________________
9. Which condition is caused by an HIV person losing more than 10% of their body weight? ________________
10. Due to the conditions mentioned in this video means that HIV has progressed to ________________.