

Digital Frog Lesson Plan

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Topic: Comparing Frog and Human Anatomy: The Circulatory, Digestive, and Urogenital Systems

Unit: Anatomy and Physiology

Massachusetts Curriculum Standards:

- 4.1 Explain generally how the digestive system (mouth, pharynx, esophagus, stomach, small and large intestines, rectum) converts macromolecules from food into smaller molecules that can be used by cells for energy and for repair and growth.
- 4.2 Explain how the circulatory system (heart, arteries, veins, capillaries, red blood cells) transports nutrients and oxygen to cells and removes cell wastes. Describe how the kidneys and the liver are closely associated with the circulatory system as they perform the excretory function of removing waste from the blood. Recognize that kidneys remove nitrogenous wastes, and the liver removes many toxic compounds from blood.
- 4.6 Recognize that the sexual reproductive system allows organisms to produce offspring that receive half of their genetic information from their mother and half from their father, and that sexually produced offspring resemble, but are not identical to, either of their parents.

Learning Objectives:

Students will be able to:

- Compare and contrast the anatomy of the frog to the human for three body systems: the circulatory system, the digestive system, and the urogenital system.

Materials:

- Digital Frog Software with Computer
- Worksheets with Lab Activity Instructions and Venn Diagrams

Procedure:

Prelab: Compare and contrast the frog to the human at the organism level with a class discussion. To begin, provide a Venn Diagram to each student relating the frog to the human (see attached worksheets). Complete a Think-Pair-Share by first having each student fill in any similarities and differences they can think of relating the two organisms. Second, pair the students to share their answers with each other. Third, gather the class together to compare and contrast the two organisms together, with each pair of students offering an answer.

Lab Activity: Students will open the Virtual Frog software. This activity focuses on the Circulatory System, Digestive System, and the Urogenital System, though this could easily be modified for any of the included systems. For each system to be studied, they will first dissect any related organs under the “Dissection” menu and then navigate to the “Anatomy” menu to learn about the organs and the corresponding organ system in greater detail. See the below worksheet for the outline of the organs and systems to be analyzed. Students should pay particular attention to the icon on the bottom right of the screen that discusses any differences in human anatomy. With this information, they will complete a Venn Diagram for each system studied, comparing and contrasting the frog and the human.

Assessment:

- All students will submit their four completed Venn diagrams following this lesson.

- Name: _____

The Virtual Frog Lab Activity Instructions

- Open the Virtual Frog software.
- Navigate to “Dissection” and choose to dissect the “Body Cavity”. Return to this screen or navigate to another page by using the Map, available from the menu or the letter key “m”.

Circulatory System

- Navigate to “Dissection.”
- Complete the dissection for the **heart**.
- Navigate to “Anatomy.”
- Read about the **Circulatory System** and complete any of the activities under this topic.
- Complete the Circulatory System Venn Diagram worksheet, recording the similarities and differences between the frog and the human for this system.

Digestive System

- Navigate to “Dissection.”
- Complete the dissections for the **mouth, liver, stomach, and intestine**.
- Navigate to “Anatomy.”
- Read about the **Digestive System** and complete any of the activities under this topic.
- Complete the Digestive System Venn Diagram worksheet, recording the similarities and differences between the frog and the human for this system.

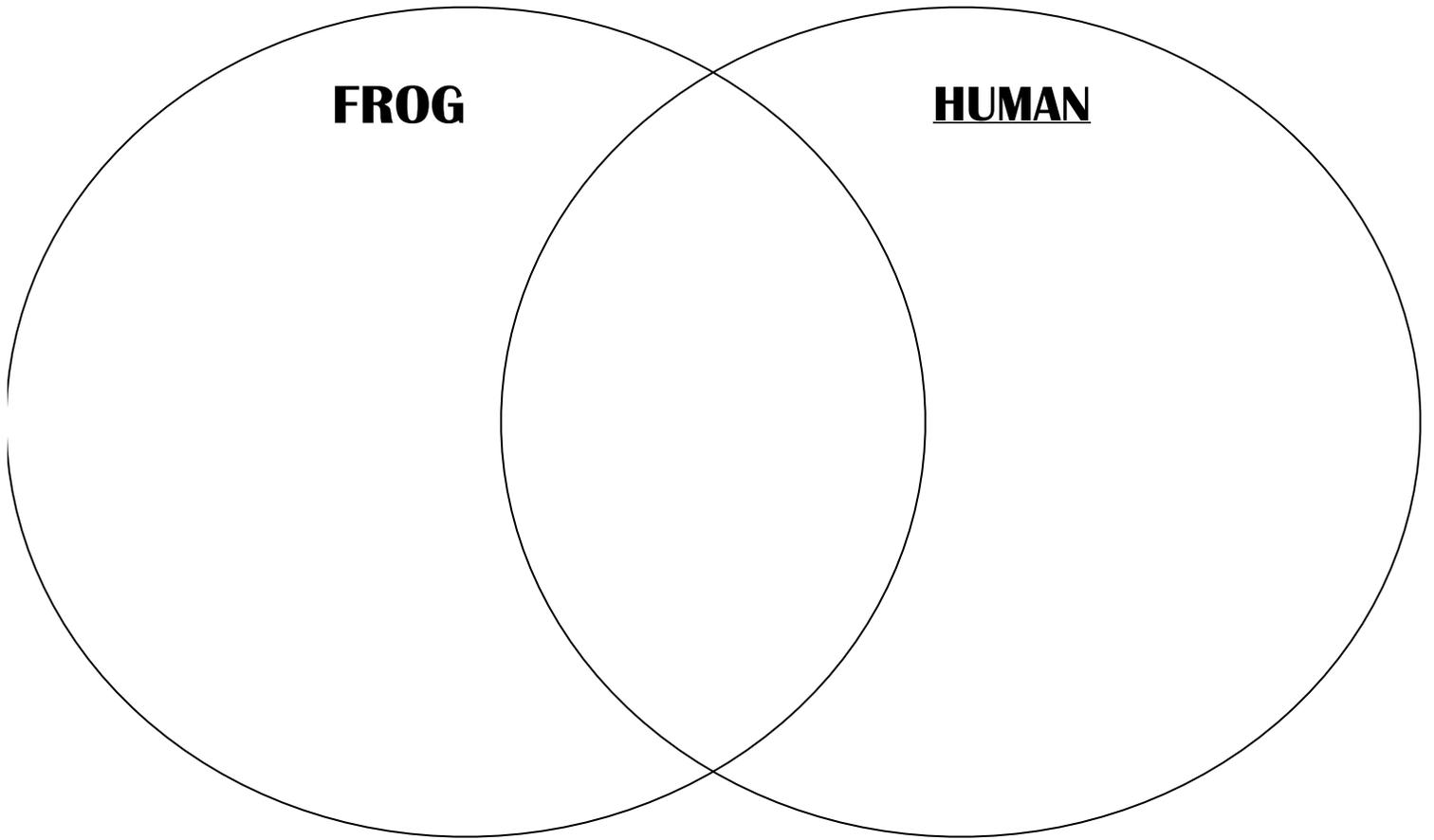
Urogenital System

- Navigate to “Dissection.”
- Complete the dissections for the **urogenital** organs.
- Navigate to “Anatomy.”
- Read about the **Urogenital System** and complete any of the activities under this topic.
- Complete the Urogenital System Venn Diagram worksheet, recording the similarities and differences between the frog and the human for this system.

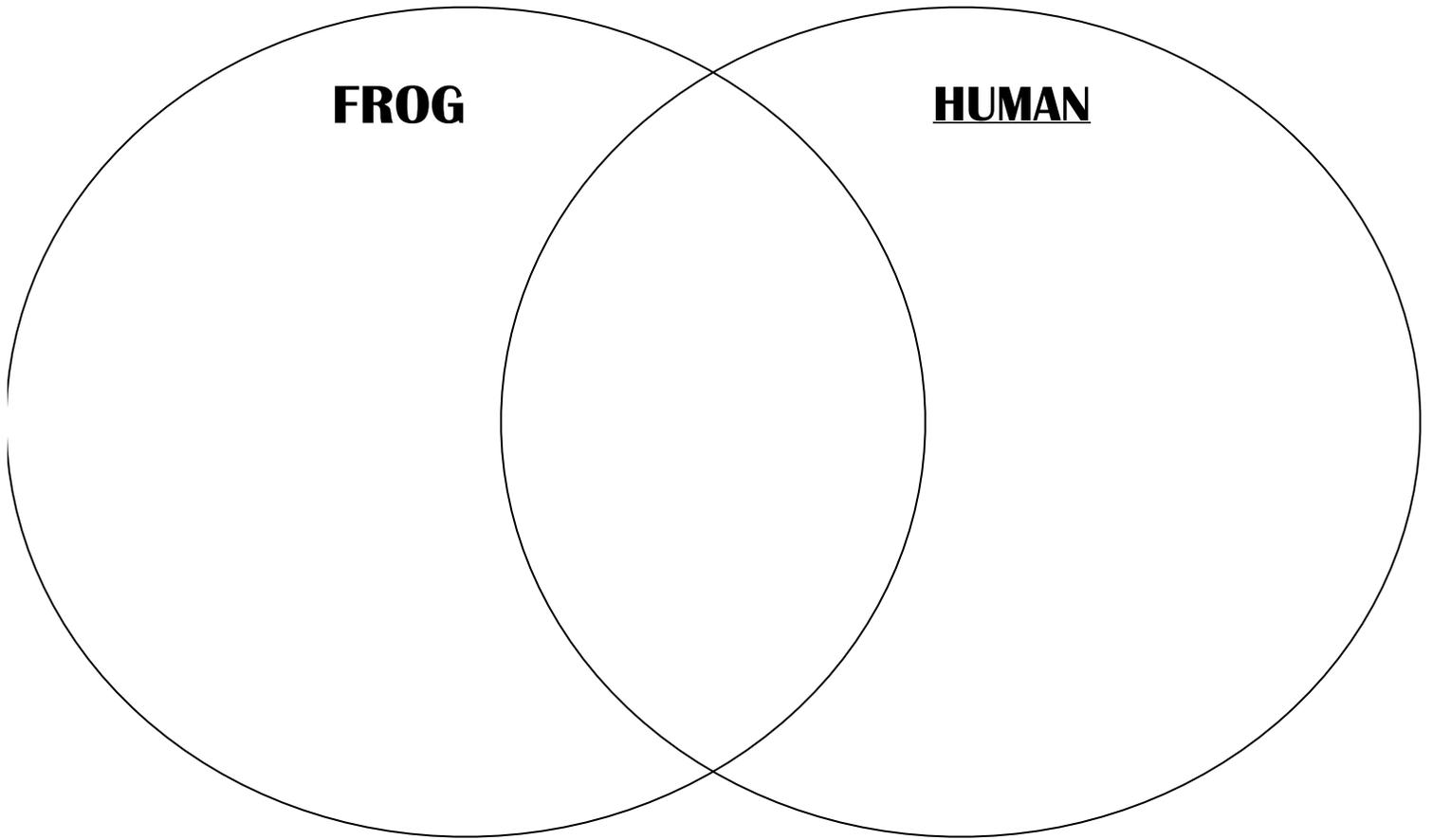
When completing the Venn Diagrams,

- *Similarities may include the overall functions of the system and major organs.*
- *Differences may include slight modifications within the organs or the presence or absence of one organ.*
- *Pay attention to the icon on the bottom right of the screen; this shows up only when a difference in human anatomy is pointed out!*
- *Each Venn Diagram must have at least six points identified, preferably a mixture of both similarities and differences.*

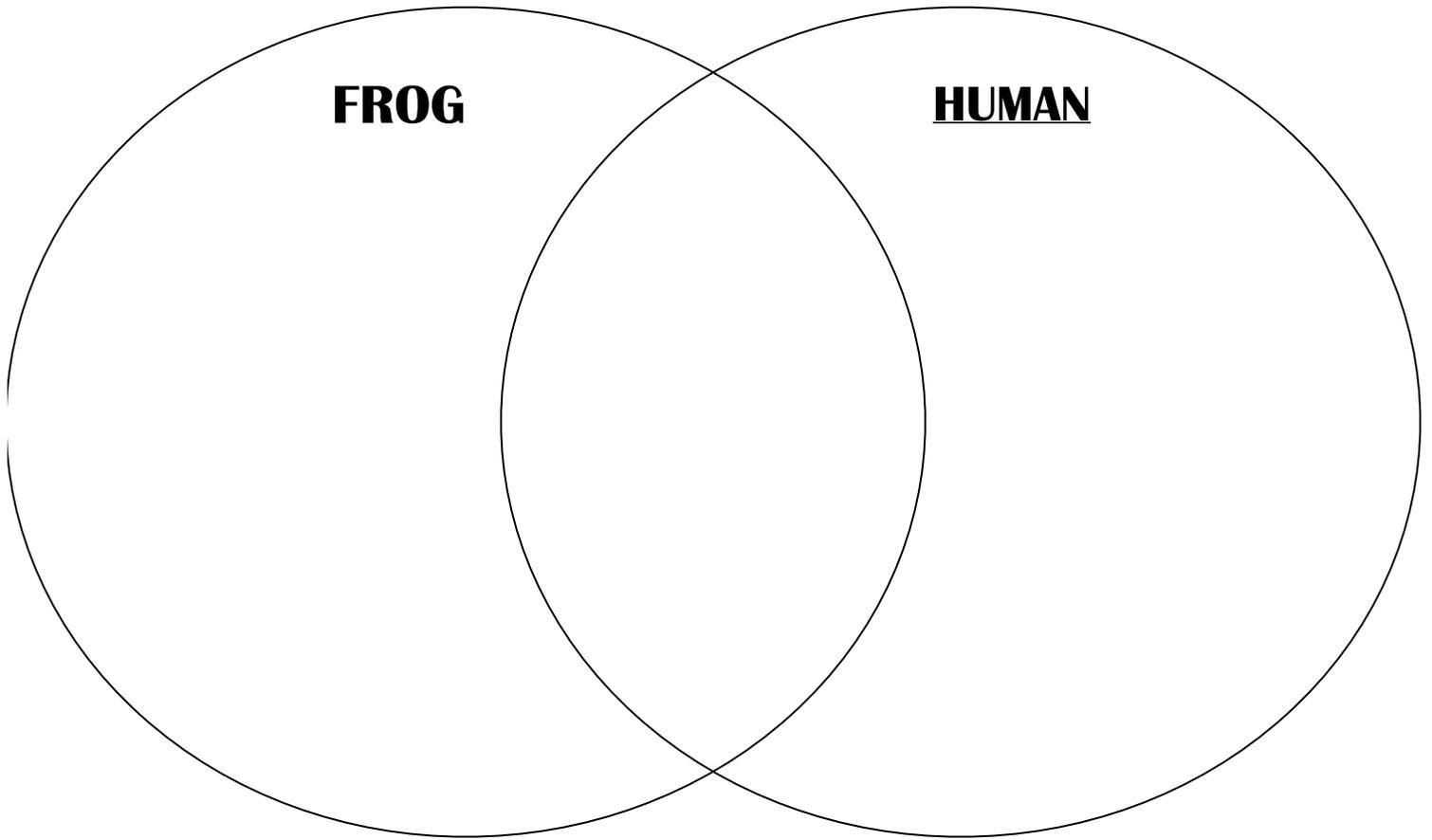
VENN DIAGRAM: ORGANISM LEVEL



VENN DIAGRAM: CIRCULATORY SYSTEM



VENN DIAGRAM: DIGESTIVE SYSTEM



VENN DIAGRAM: UROGENITAL SYSTEM

