

Human Body Network

Name: _____ Period _____

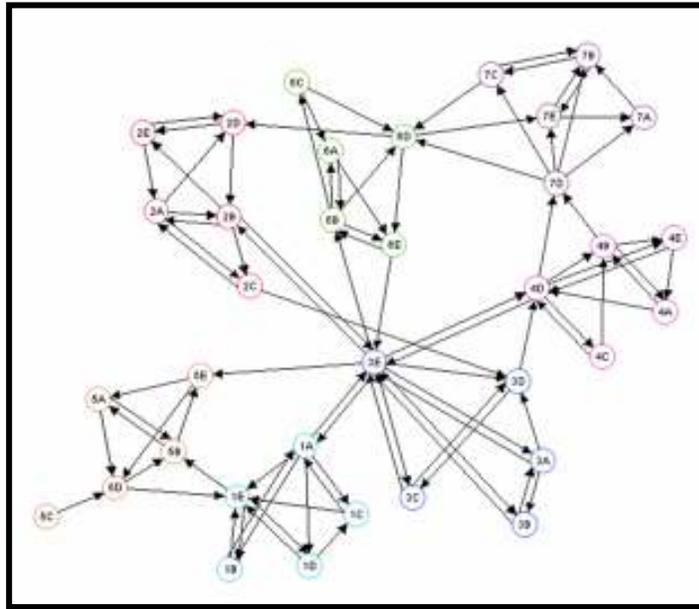
Engage

You have seen and worked with this network so let's make some observations about the network to refresh our memories. In the space provided, make some observations from the following prompts:

Make some observations about the number, size, etc. of different groups within the network.

Make some observations about individual nodes within the network, possibly number, importance etc.

Observations:



The levels of organization in a multicellular organism include cells, tissues, organs, and organ systems.

In the space provided, name 4 organ systems within your body (Hint: circulatory system)

Then, create a simple network using the organ systems you just listed from the previous question.

List of 4 Organ Systems

Organ System Network:

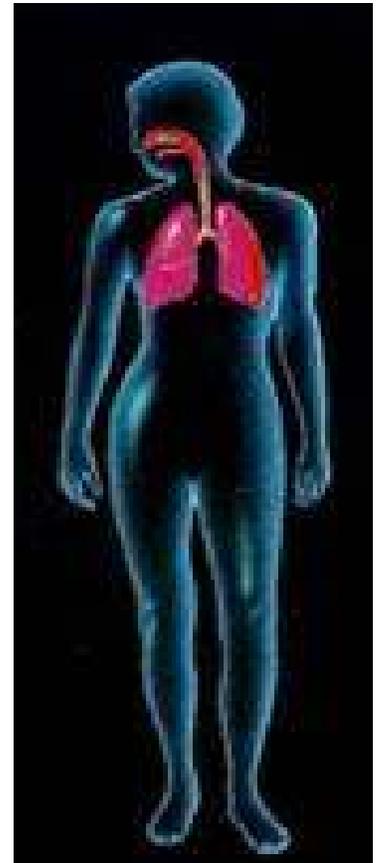
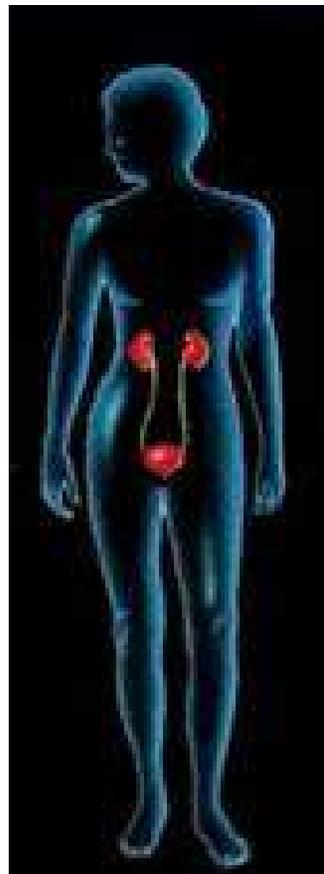
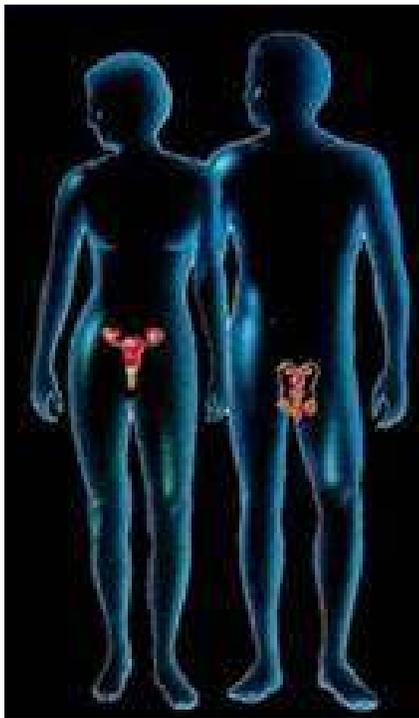
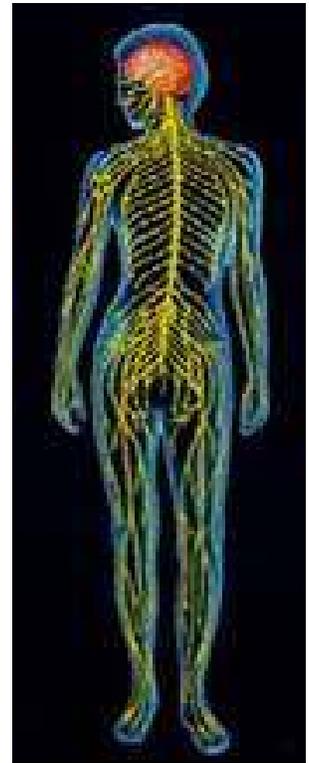
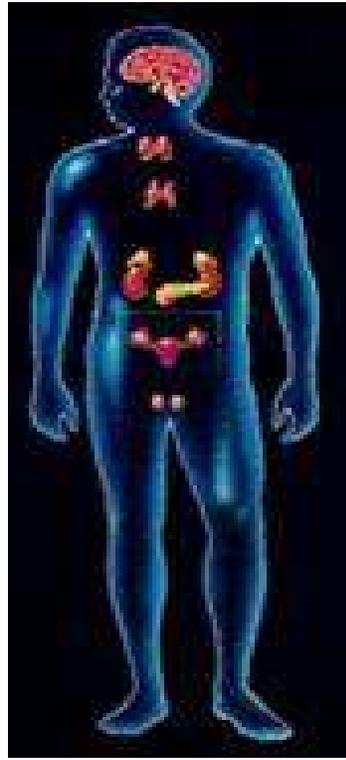
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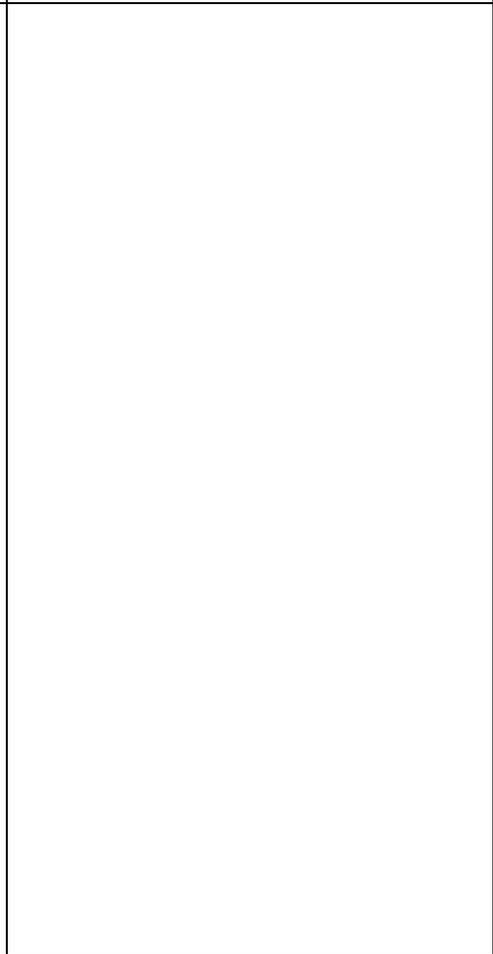
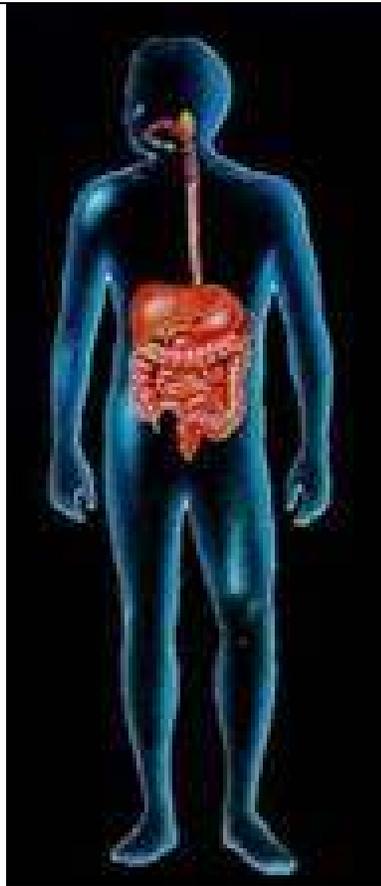
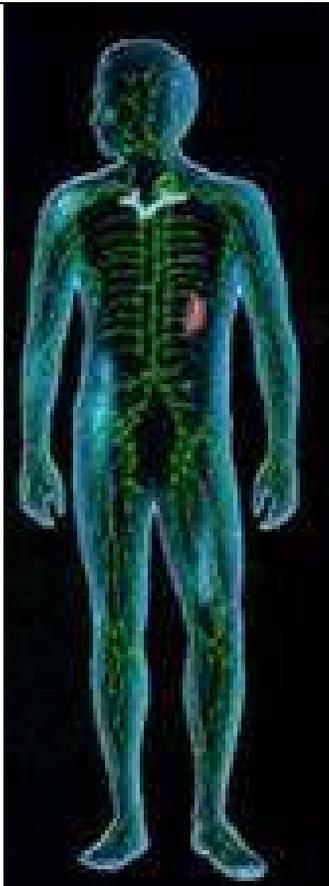
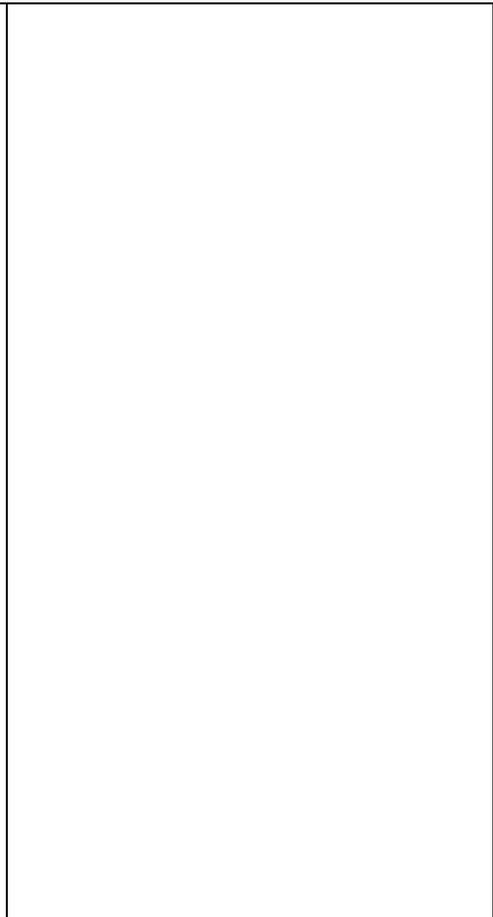
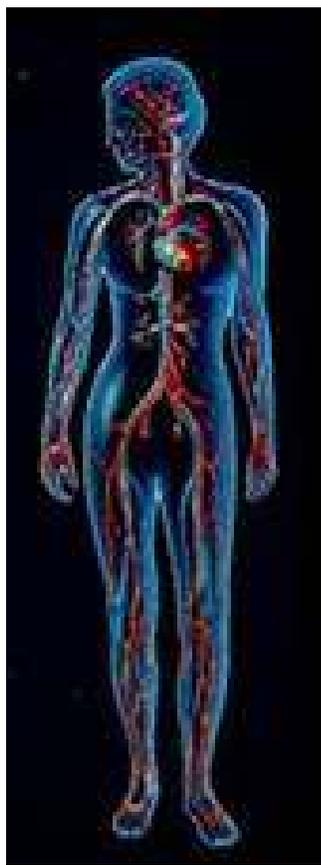
Explore:

Let's see what you know about organ systems, try to identify what organ system is represented by the picture and justify your selection with some observations about the system picture. If you don't know the name of the system, make some observations about the picture that represents this unknown system. While you are working, you may want to watch the video at (<http://www.youtube.com/watch?v=TGSDe-8Q56I>) for some guidance. These images might be a bit hard to see details so larger color flashcards or digital images might be provided to help you out.

Picture	What's the system? What your evidence? (observations)	Picture	What's the system? What your evidence? (observations)
			
			
			
			
			

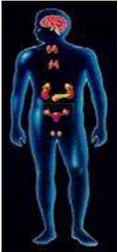
Flashcards





Explain:

Now that you are more familiar with the body systems, watch the video at (<http://www.youtube.com/watch?v=SSqwRkDLyH4>) and answer the following questions for each system.

Picture	What's the system? Organs in the system? Function of the system? Relationships to other systems?
	
	
	
	
	

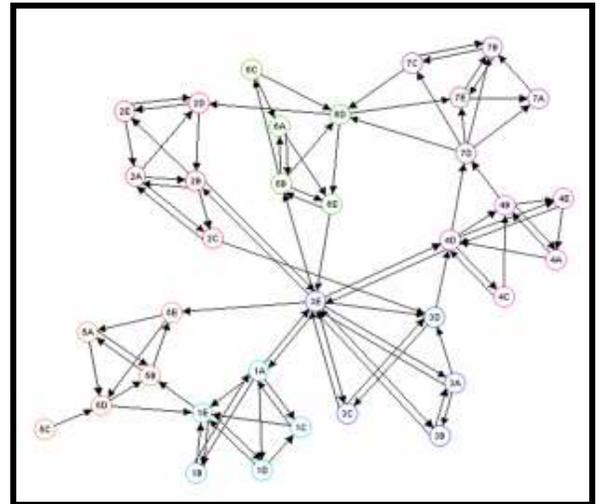


You may need to revisit your explore portion of this human body system activity to ensure that you correctly identified the systems correctly.

Elaborate:

Directions: Answer the following questions using the network map or going to (<http://baliga.systemsbiology.net/cytoscape/cellphone/help.php>) and selecting “lab simulation” to run the Cytoscape cell phone software. We are going to imagine the cell phone network as the human body.

1. Without getting caught up with all the details of the network, and using the knowledge you just gained, what does the box (entire network) represent?
2. Without getting caught up with all the details of the network, what does each group of numbers (3's or 4's (motifs)) represent in the human body?
3. With out looking at all the details of the network, what does each node represent in the human body?
4. With out looking at all the details of the network, justify why 3E is a decent representation of the brain.



5. If 3E were the brain, what system do all the 3's belong?
6. If 3E were the brain, what organs would best represent 3A and 3B? Justify your answer
7. In what ways, is this network a decent representation of the human body?
8. What do the edges (arrows) specifically represent in the human body?
9. In what ways does this cell phone network fail to represent the human body?
10. Why does the network below fit the cell phone scenario but not the human body?
11. Why do conceptual models (such as the cell phone network) always fail at some point?
12. Why are conceptual models also extremely helpful?
13. What are the advantages of technology in building and analyzing biological conceptual models?

Elaborate 2,3,4,5... (Future Ideas)

After each body system has been covered in detail (explain), a list of organs from that system could be give to each groups of students and a network could be constructed showing the relationships between these organs in each system covered. The students would need to be able to justify the relationship between each of their nodes (edges) and clearly label them. Then the student groups could compare their networks to see differences and similarities

Evaluate (final evaluation)

Now that the students have created some organ networks for each of the systems covered, a final evaluation could be to combine each of their networks into one massive network, showing the relationships between only the organ systems within the human body.