

“How did organ systems evolve - the history behind it all...”

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Background: Multicellular eukaryotes have evolved over time to accumulate a high degree of complexity at both the inner and outer levels. For example, the organ systems in our the body, the way they coordinate and collaborate with members in their own system as well as with organs in other organ systems provides an insight into how evolution might have shaped/fine-tuned their functionalities so as to make them a good fit for their assigned role in the organism. Therefore in order to have a better idea of how we function as humans on a daily basis of course with the help of our organs, it is best to start where and how it all began in the simpler life forms. This group activity will allow students to visualize the evolution of our organ systems and in the process help them to understand that complex organs do not simply appear in new species, they evolve as well.

Materials:

Most Biology textbooks have at least some information on organ systems in different organisms. I use this to get them started on Day 1.

Any Movie making software (I used Windows Movie maker). It is very user friendly and easy for first timers as well.

Computer and Internet access to carry out research.

Assign one organ system per student group and each group will put together a movie that describes how their organ /organ system started off in the invertebrates and over time led to the formation of our organ systems. Every video must include at least two-three invertebrates and two other vertebrates besides humans.

Timeline: (Please feel free to modify according to your school/class meeting times and length of period). In my school we have block scheduling and periods are 80 minutes long and we meet on alternate days.

- **Day 1 (usually takes most 60 minutes after the project has been explained):** Students get in their groups and start off by reviewing and discussing the information on appropriate pages in your textbook + Figures (if any). Each of the groups cover invertebrates (only their assigned organs/organ systems) and then summarize the information in a flowchart/concept map – checked by teacher next class. Their homework includes any additional research that they might need to fill in the information gaps.

- **Day 2** : Now they read and evaluate the information on vertebrates as it pertains to their assignment + Figure (if any) and summarize the information in a flowchart/concept map. This will be turned in next class.
- **Day 3** : The group makes a plan for their 5 – 10 minute video. They have to be creative so that they can attract and hold on to the attention of the high schoolers. Classwork + Homework – each group member comes up with a written plan).
- **Day 4:** Group gets together and comes up with a final plan. The students then spend time researching on the web looking for information and or find relevant images / text.
- **Day 5:** Group now organizes their storyboard and gets it okayed by the teacher. Then they can start creating their Movie.(we meet again in groups 2-3 days later)
- **Day 8:** Groups spend time editing their movie in class and **their finished project is due 4-5 days later. They have to put their movie on CD or a flash drive.**
- **Day 12: The finished product, the Movie, one for each organ system is submitted to the teacher, watched by the entire class and graded according to the attached rubric.**

Comments: I find that this student-directed activity works as a great introduction to the Human Body and the concepts that they come across here are reinforced over and over during our class discussions.

Organ systems included in my last class:

- Circulatory
- Digestive
- Water Balance and waste Disposal (Excretory)
- Gas Exchange (Respiratory)
- Reproductive