



DIVERSE WAYS OF ASSESSING STUDENTS IN SCIENCE

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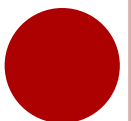


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WHAT IS DIVERSITY?

The Oxford Dictionary defines **Diversity** as the state of being diverse; variety
the practice or quality of including or involving people from a range of different social and ethnic backgrounds and of different genders, sexual orientations, etc.

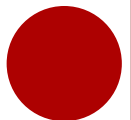


WHAT DOES DIVERSITY MEAN TO ME?

Diversity means many different things to me as an educator.

Diversity means recognizing that each individual is unique, and recognizing our individual differences.

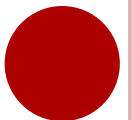
Diversity in education means providing many diverse learning materials to encourage students with different perspectives to successfully demonstrate their understanding.



WHAT IS DIVERSITY IN THE CLASSROOM?

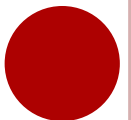
Diversity means building a culturally responsive classroom.

Diversity means advocating for racial diversity in Science and building safety guidelines to accommodate students with differences in race, gender, socio-economic status, ethnicity, sexual orientation, etc.



WHAT TO CONSIDER WHEN THINKING OF DIVERSE ASSESSMENTS

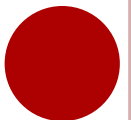
- How to engage students in a constructive way
- How to remove their inherent fear of written assessments
- How to encourage them to use skills that they have to solve the problem presented
- How to do all this without making it seem like “just another thing to do!”
- How to have them reflect on what they have done



WHERE TO BEGIN?



- Use parts of your curriculum that are amenable to change
- Find something interesting that you can introduce as a hands on activity
- Have students perform the activity and reflect on it for better understanding



USE RESOURCES FROM EVERYDAY LIFE

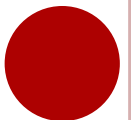
- Use articles from news, sports, recent research, etc to formulate challenging questions for the students
- Make sure that you give them enough information to be able to work their way through it



SOME TIPS TO ENGAGE STUDENTS



- Present the problem
- Present the information needed to solve the problem
- Make connections and complete the task
- This helps students articulate their understanding on assessments

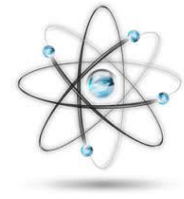


TWO WAYS IN WHICH I INTRODUCED DIVERSITY IN ASSESSMENTS

- Heart Model Project
- Graphic Novels Project



HEART MODEL PROJECT



Task:

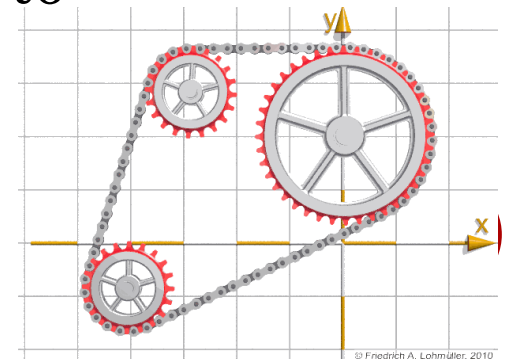
To study the workings of the cardiovascular system

Experiment:

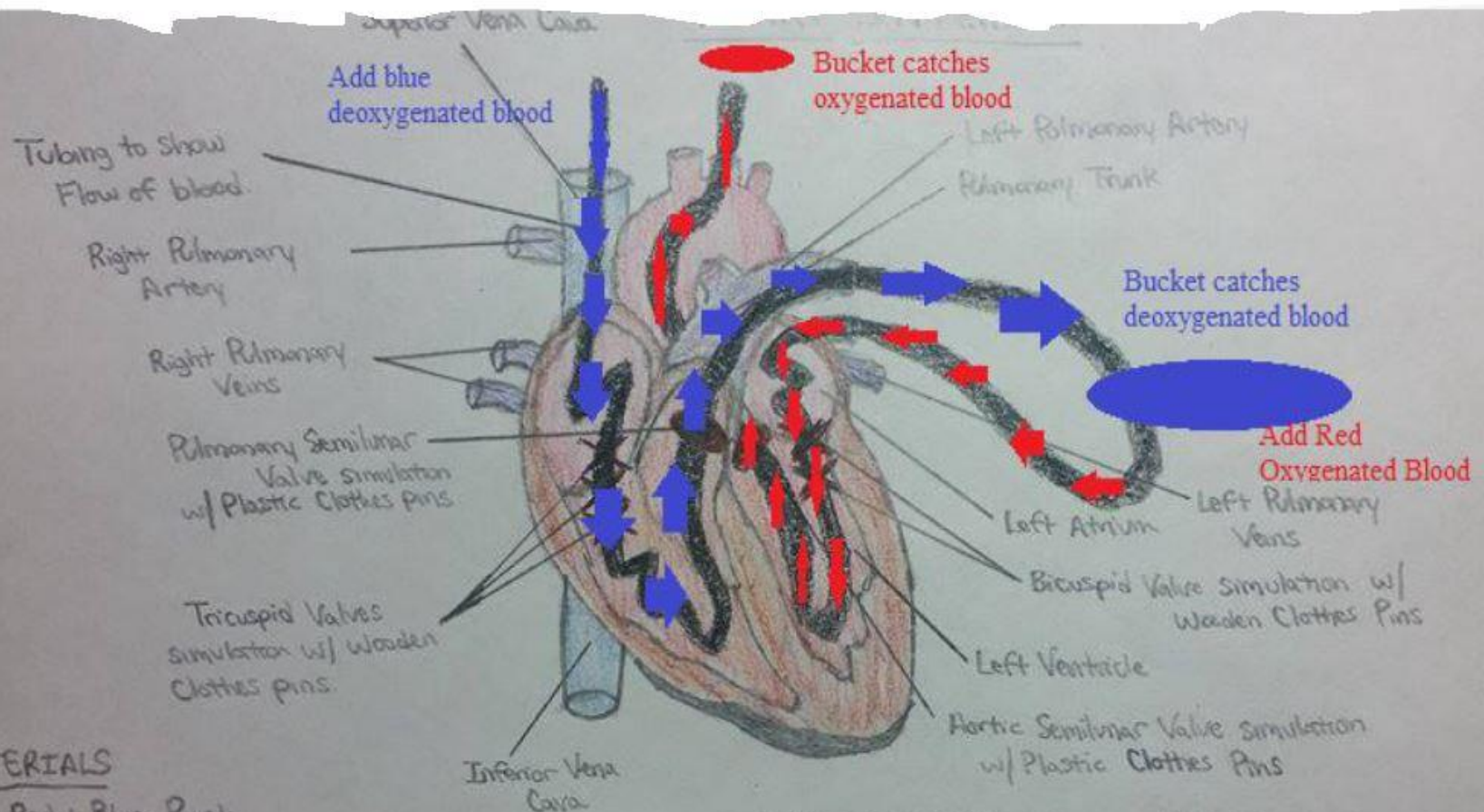
Design a heart model, get my approval and optionally (for extra credit) make it work

Conclusion:

Reflect on your design and connect the heart working (both electrical and mechanical) to principles of physics and engineering



EXAMPLE OF A HEART MODEL DESIGN



MATERIALS

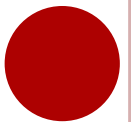
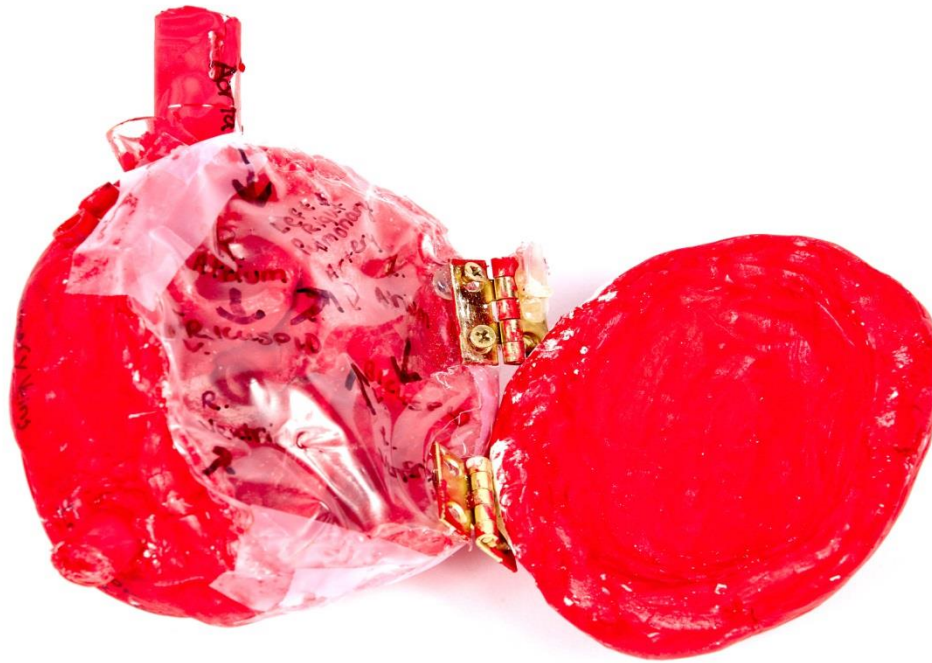
- Red + Blue Paint
- Hinge
- PFA tubing
- Duck Tape
- Clothes pin
- Food coloring

- * All cardiac muscle + tissue will be formed from clay
- * All vessels will be made from plastic tubing
- * Outline of heart in background just to show which tubing corresponds to the vessel.

STANDING HEART MODEL



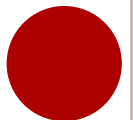
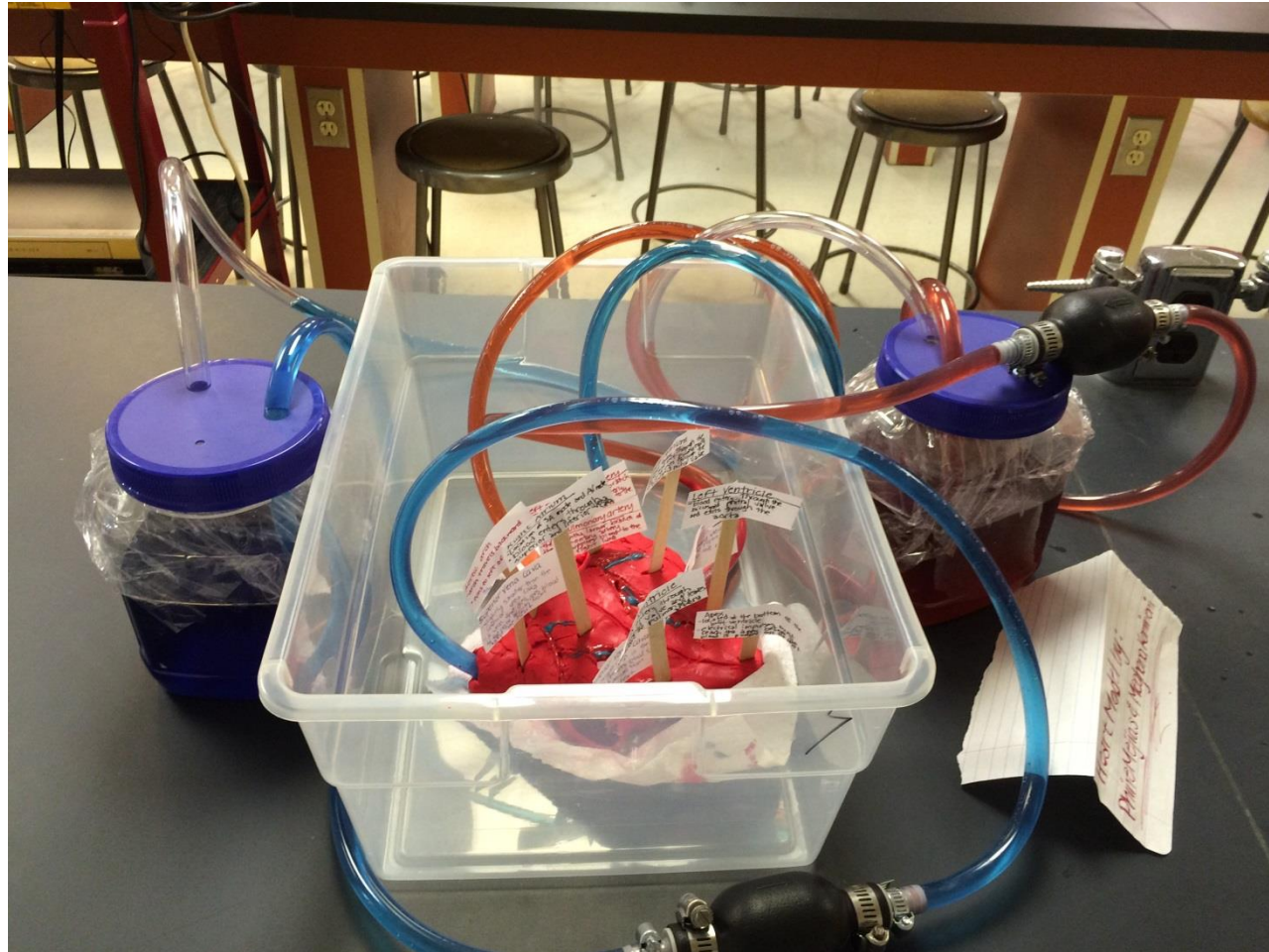
OPEN HEART MODEL



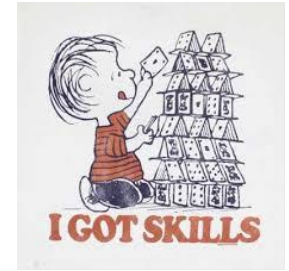
NOT SO GOOD HEART MODEL



INNOVATIVE HEART MODEL



GRAPHIC NOVEL PROJECT: APPLICATION OF SKILLS LEARNED



Task:

Hands on activities to engage student's creativity using skills learned from heart models

Experiment:

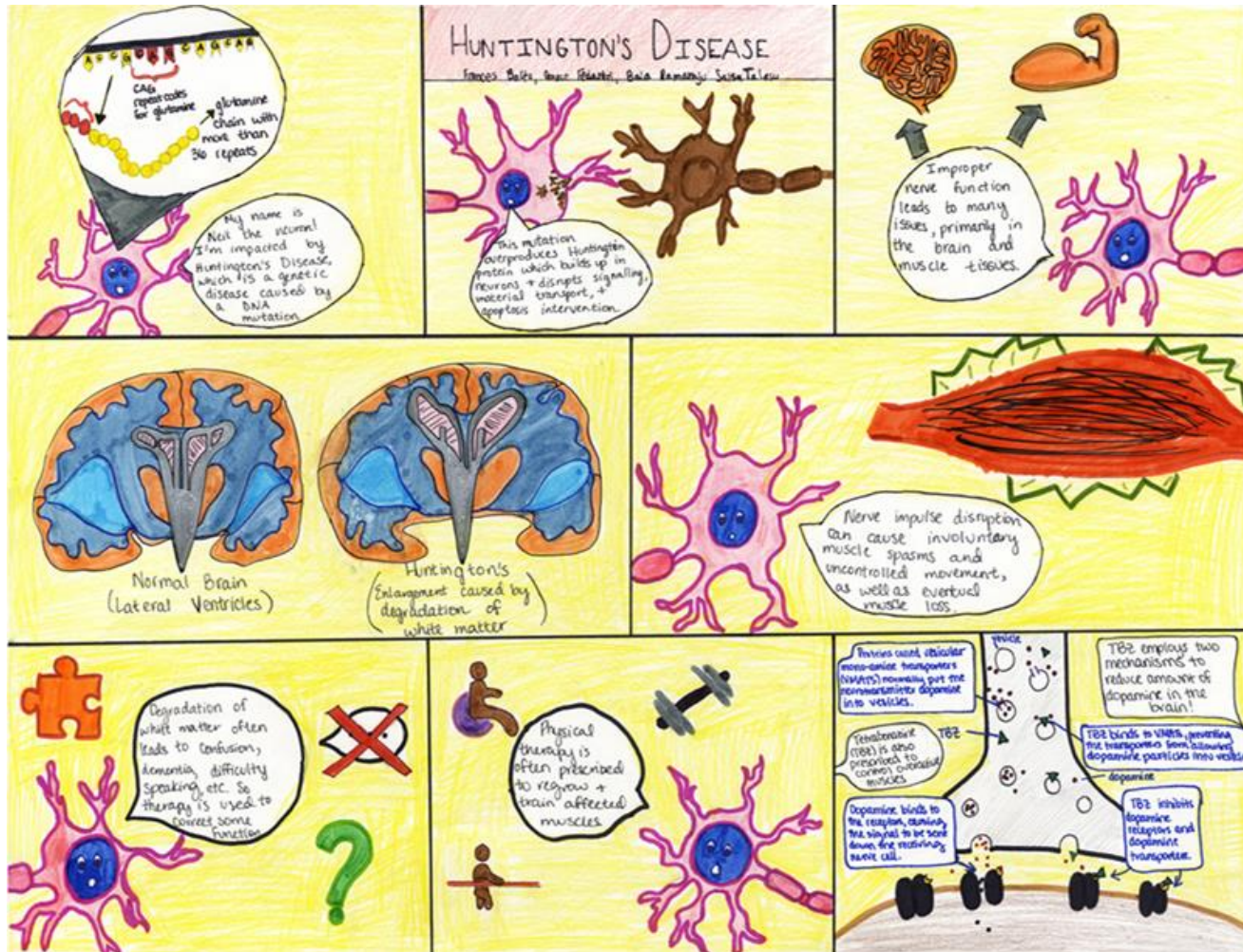
In groups of 2-3, pick any two organ systems that you have studied in class and draw a comic explaining how homeostasis is disrupted

Conclusion:

Reflect on the pathophysiology of your diseases in terms of inputs and outputs of the biological systems. What disrupted homeostasis and how is it fixed?



GRAPHIC NOVELS PROJECT EXAMPLE



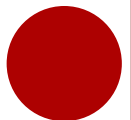
STUDENT FEEDBACK

- "This is a cool way to understand Physiology."
- "I loved making the heart, it taught me so much. I learned that it is okay to fail many times before I succeed!"
- The graphic novels are so awesome, I have never done anything like this before. I learned so much more than just giving a presentation and it was fun too."
- "I did better on the quizzes because I understood the material better by doing these projects."
- "I could use my artistic skills to do these projects."
- "I finally found a class where I could learn material in a different way."



YOU CAN DO IT, TOO!

- Anjur, S. 2011. Improving Student Performance in Inquiry-Based Science Courses. Spectrum(the Illinois Science Teachers Association Journal (Winter 2011 issue), 36(3):23-25.
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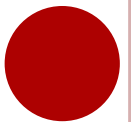
CONCLUSION



- Diversity in assessments is not hard to introduce and sustain in the classroom if connections are made with things the students are “familiar” with
- The crazier the idea, the more the engagement!



QUESTIONS?



THANK YOU FOR LISTENING!

