Ms. Anissa J Brown and Mr. Michael Kittel

Howard High School

Physical Science and Biology

HOW TO SUCCEED

HOWARD HIGH SCHOOL OF TECHNOLOGY

Doctoral Candidate
"Role of heparanase in bone development"
Biological Sciences
Dr. Mary C. Farach-Carson

Funded by National Science Foundation Graduate Teaching Fellows Program in K-12 Education (GK-12) DGE 0538555

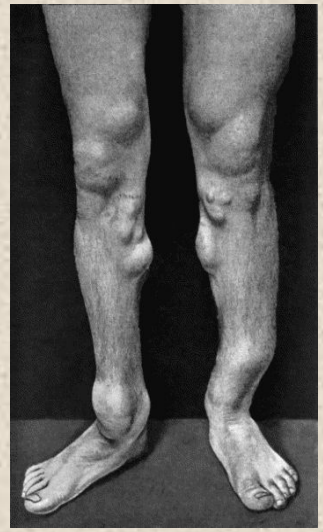
As a GK12 fellow, it was my responsibility to create an "exciting" learning community to examine and reflect on current issues in science in accord with the curriculum of the science education in New Castle County Vocational Technical High Schools

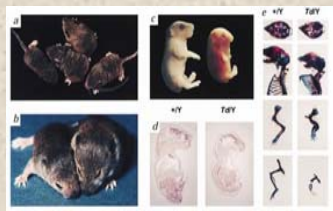
- Incorporated my scientific research into classroom lectures/ activities
- Developed activities that focused on constructing visuals highlighting different biological processes using unusual materials
- Evaluated student understanding through "Journaling"
- Created activities emphasizing study skills that can be applied to all subject areas and establishing connections between various units

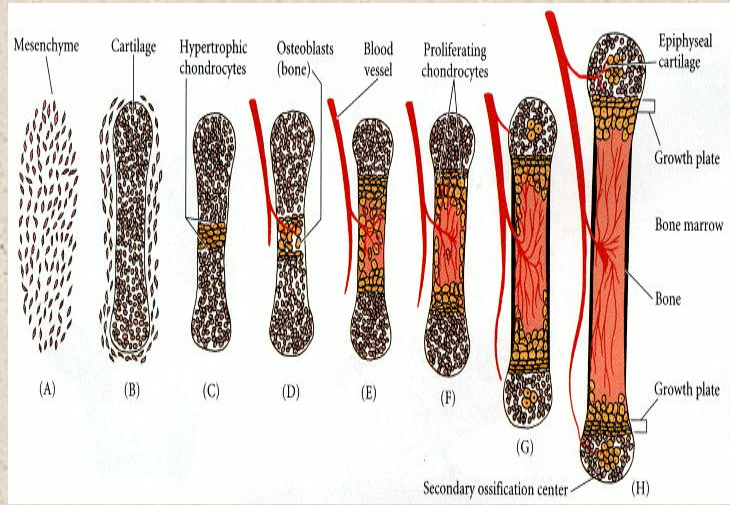
Remember:

- Structure is dependent on function
- Homologous structures allow one to make an inference of the common ancestor and determine evolutionary relationships

<u>More importantly</u>, the similarity between structure and function allows scientist to use various animal models to understand human diseases







2day old metatarsal from ICR mouse

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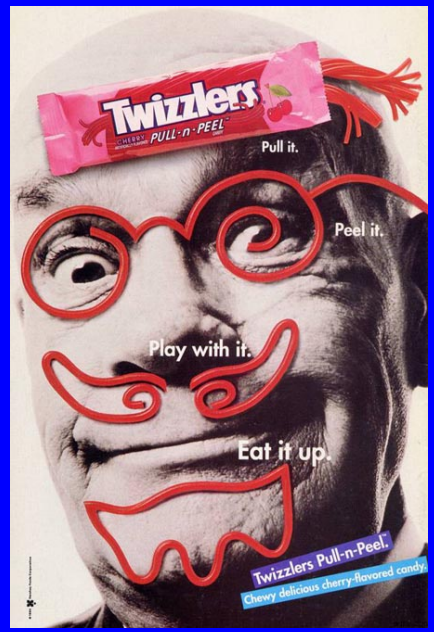
Making a Mitosis model using Twizzlers

(Working in pairs)



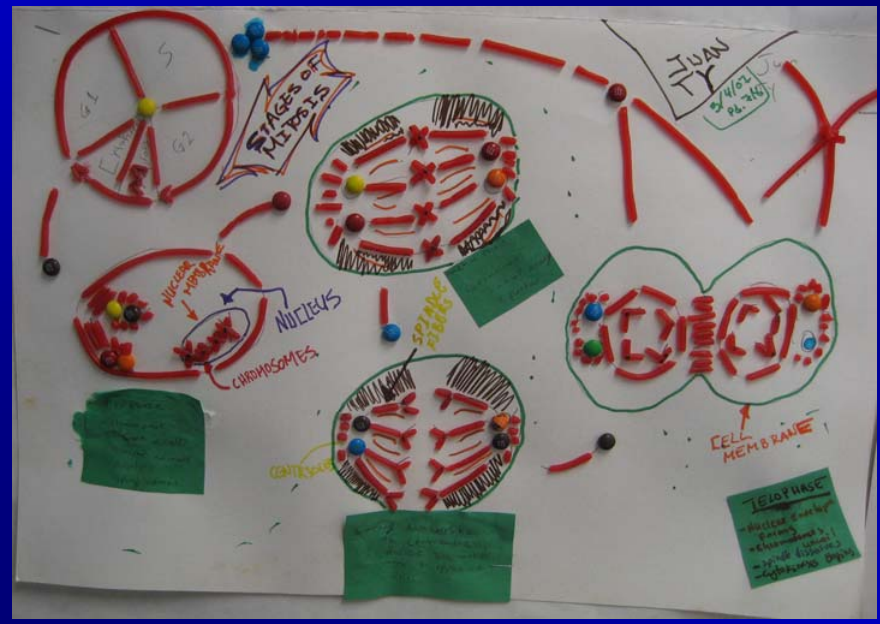
Materials:

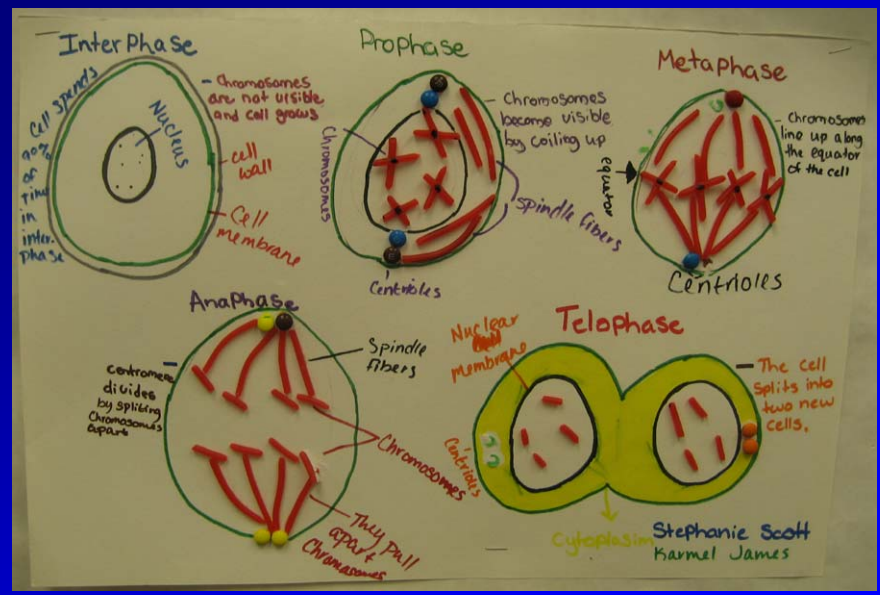
- ❑ plain white paper
- ❑ 1 twizzler rope
- ❑ 24 red hots
- ❑ Writing utensil

Resources:

- Biology: Principles & Explorations text (p130)
- "Cells Alive" website *cellsalive.com*

Using visuals to model basic concepts of science





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"Cancer Cell: Mitosis Gone Wild"

As an oncologist, you must explain what is happening to their cells? Cancer cells?

"The cells are growing bigger. Cells are controlled by an internal clock. Cancer causes change in DNA. Protooncogenes and tumor suppresser genes affect the cell cycle and they became uncontrollable, uncontrolled growth. Cell checkpoints not working and DNA replicating to fast causes cancer."

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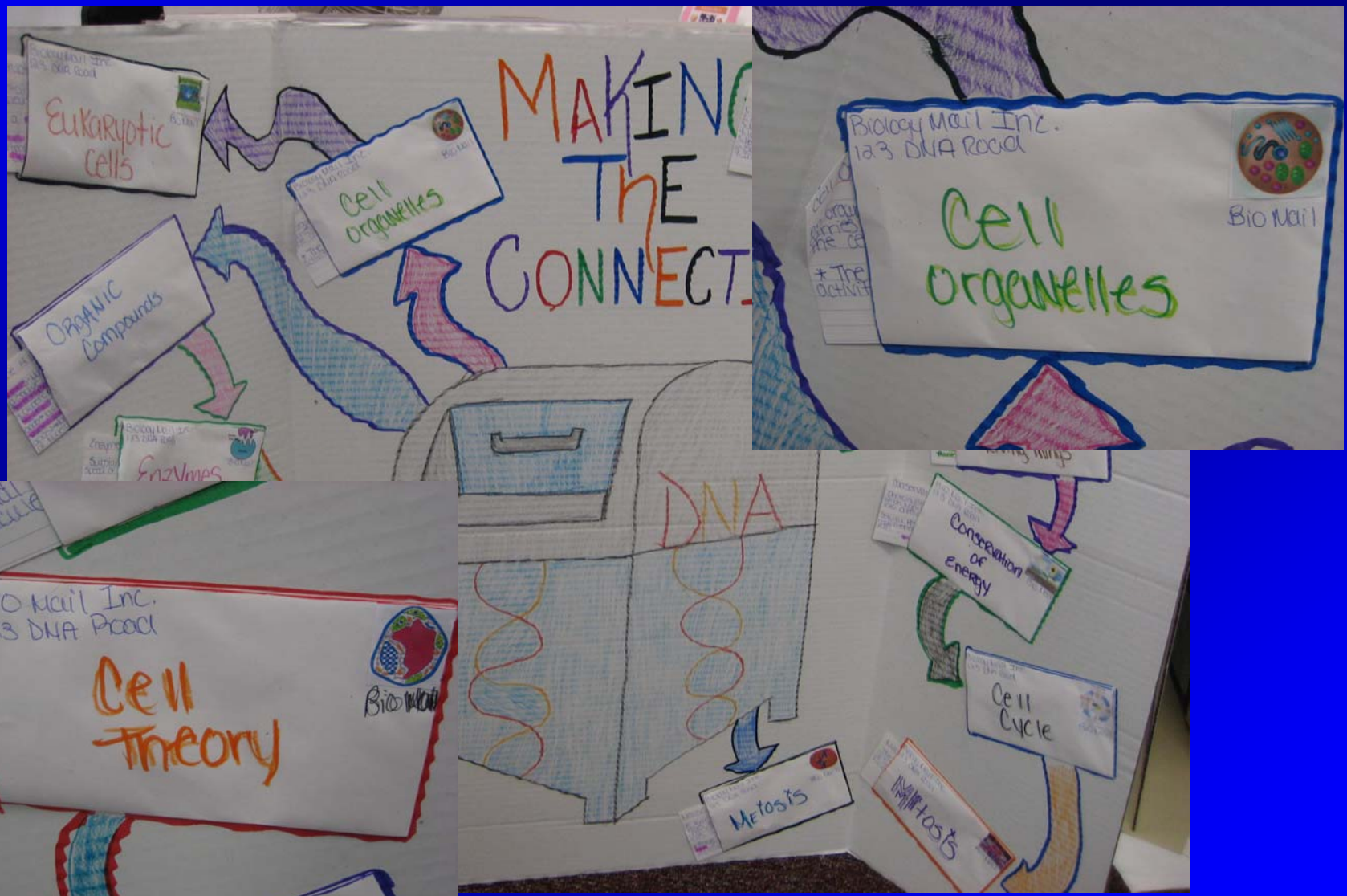

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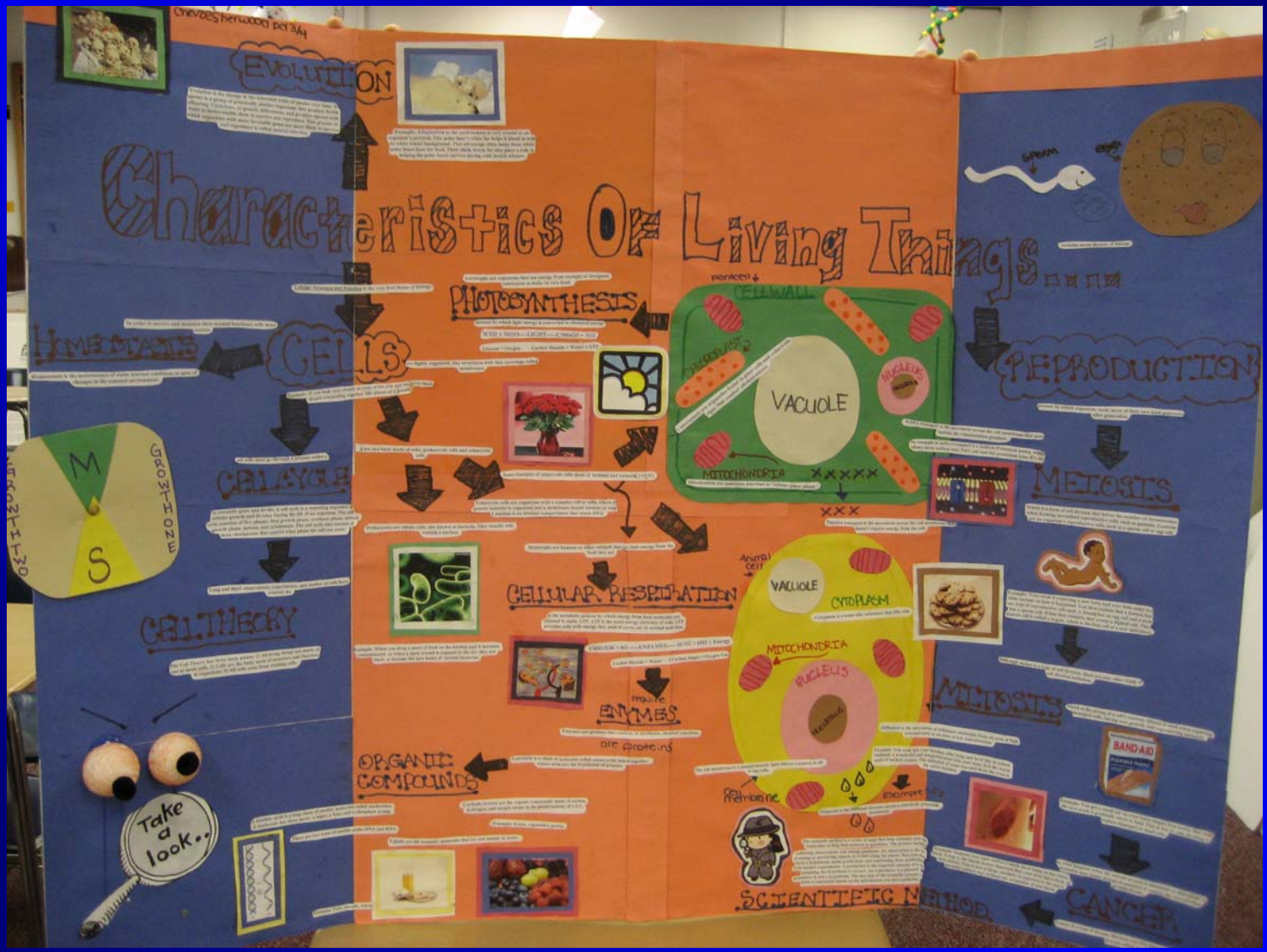

Additional tasks completed

Working with students one-on-one with classroom assignments, notebook organization, and developing good study habits

Grading test and assignments to identify students that may need more one-on-one assistance

Providing written and oral feedback to students on classroom assignments and projects

Web searching to answer questions that come up during classroom discussions

Interacting with students in regards to their academic future

Benefits as a GK12 Fellow

Learning to communicate my scientific research to a broader audience

Developing creative ideas to deliver basic scientific concepts

Obtaining a better appreciation for teachers and their responsibility within the classroom

Improving my leadership and team building skills

Networking

Serving as a mentor for students

Benefits as a GK-12 Student

"Ok, better understanding, science turned out to be some fun this year even if it is 1st thing in the morning."

"She explains things slowly until I understand"

"Thanks for being here and helping me to understand clearly."

"I still feel that science is fun and very interesting but sometimes it does need for you to be very focused"

Acknowledgments

Dr George Watson
Michael Kittel
Amy Quillen

GK12 Staff and Co-PIs
GK12 Fellows
GK12 Teachers

Howard High School of Technology Staff
Howard Students

Dr Cindy Farach-Carson
Dr Daniel Carson
the Farach-Carson/ Carson Lab

NSF