

UDL Unit

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Content

Subject: 5th Grade Science

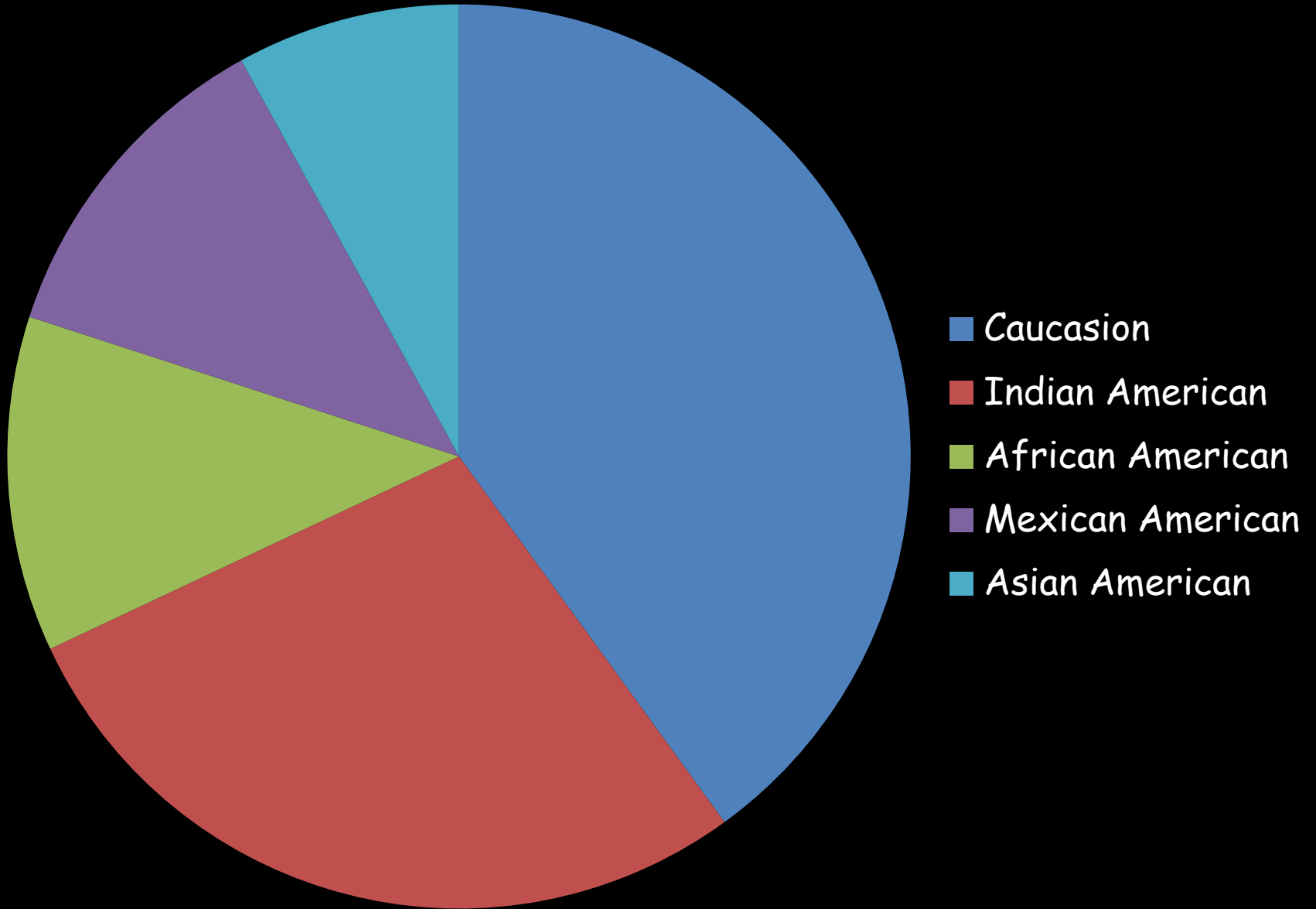
Topic: Cell Characteristics

Time Frame: 7 days

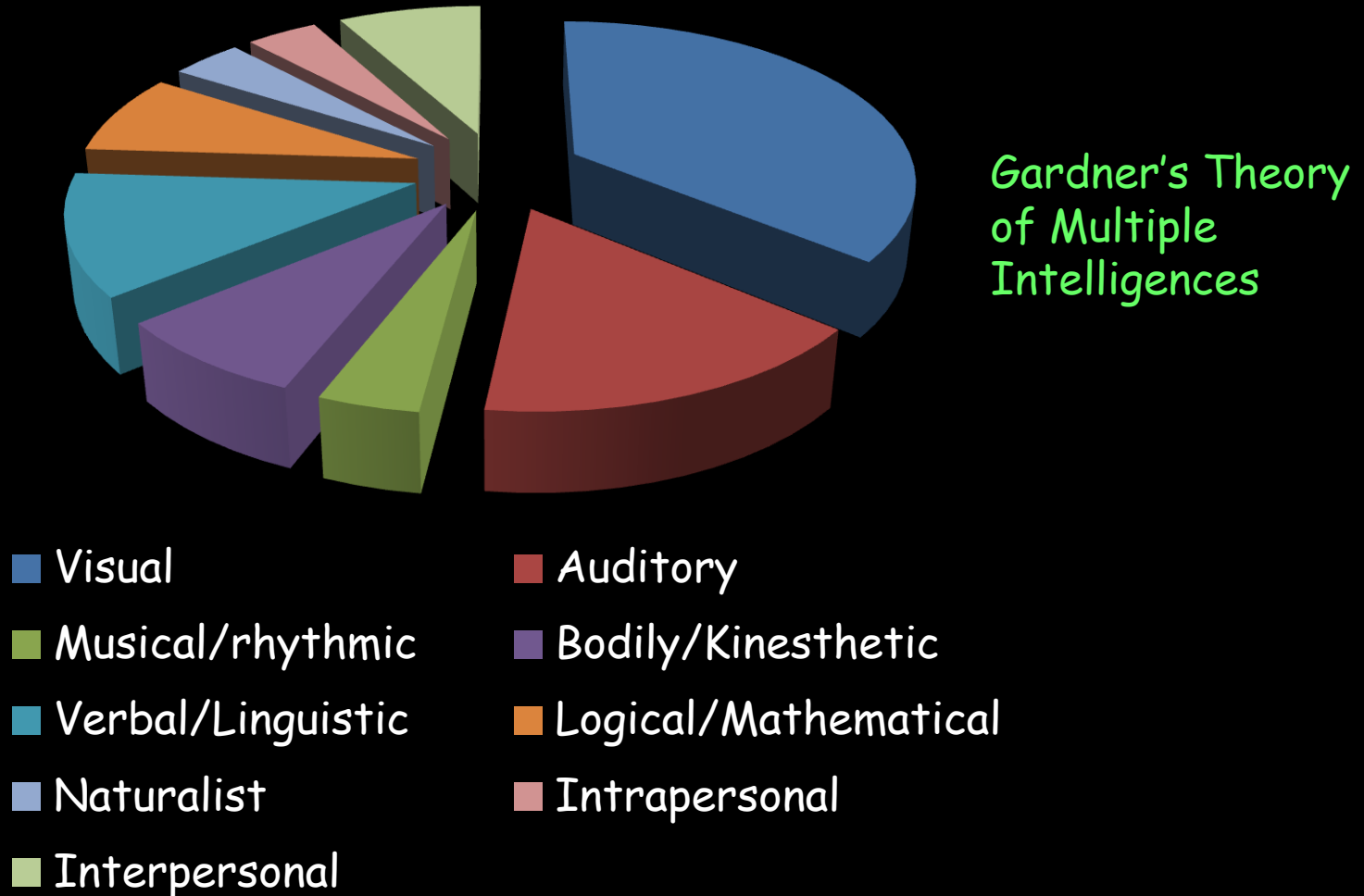
Demographics

- The class consists of 25 students. There are 15 girls and 10 boys. The students families are of a working class/middle class socio-economic status. They are in a suburban environment and have a variety of ethnic backgrounds. Additionally, within the classroom, there are 6 Catholic students, 5 Protestant students, 5 Hindu students, 2 Muslim students, 3 Buddhist students, and 4 students who do not identify with a religion.

Student Ethnicity



Learner Characteristics Chart



Learner Characteristics

- Three of the students have specific and identified learning disabilities. Of these students one has dyscalculia, one have dyslexia, and one has an auditory processing disorder. One of the students has attention disorder. One student has a mild loss of hearing and requires hearing aids.

Learner Characteristics

Continued

- There are 4 students struggling with Reading, 18 students performing on grade level in Reading and 3 students struggling in Reading.
- There are 6 students struggling with Math, 15 students performing on grade level in Math and 4 students performing above grade level in Math.
- There are 4 students struggling with Social Studies, 17 students performing on grade level in Social Studies and 4 students performing above grade level in Social Studies.

Goal Statement

- At the end of this unit students will demonstrate their understanding of cell structure by: identifying and explaining the relationship between cell organelles and cell structure. Students will exhibit their understanding by:
 - **defining** key terms,
 - **matching** organelles to function
 - **constructing** model cells,
 - **distinguishing** the difference between plant and animal cells
 - **evaluating** the vital role of cells in life function.

Learning Standards

Science-Standard 4

Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science

Key Indicator- The Living Environment

Living Things are both similar to and different from each other and nonliving things

Performance Indicator:

PI: Compare and Contrast the parts of plants, animals, and one celled organisms

Key Indicator-The Living Environment

Organisms maintain a dynamic equilibrium that sustains life

Performance Indicator:

Compare the way a variety of living specimens carry out basic life functions and maintain dynamic equilibrium

Word Wall

Nucleus
Nuclear
Membrane

Lysosome
Centrioles

Mitochondria

Ribosome

Golgi
Apparatus

Cytoplasm
Chloroplast

Vacuole

Endoplasmic
Reticulum

Cell Wall
Cell Membrane

Essential Questions

Which organelle would have the most dramatic impact on cell function if it were to be removed? In other words, what would happen if the most important organelle were removed? Would the loss effect plant and animal cells differently?



Calendar of Events

Monday-Day 1	Tuesday- Day 2	Wednesday-Day 3	Thursday-Day 4
<p>Summary: Introduction to cells, their basic functions and purpose</p> <p>Activities: Students work in pairs to create an essay from the perspective of a cell</p> <p>Assessment: Essay produced by students ** Students may begin working on choice board a bit each day</p>	<p>Summary: Mini-Lesson on differences between plant and animal cells</p> <p>Activities: Students observe potato cells and their mouth cells underneath a microscope</p> <p>Assessment: Students drawings of their observations in the microscope</p>	<p>Summary: Introduction to several important organelles and their function within the cell</p> <p>Activities: Students work in groups to compose short skits explaining the role of organelles, each student plays a different organelle</p> <p>Assessment: Copy of the skit handed in</p>	<p>Summary: Explanation of the remaining organelles and their function</p> <p>Activities: Students work in Jigsaw Groups, each group is given an organelle to explain. Students go to the library for research on cells</p> <p>Assessment: Presentation and poster</p>

Calendar of Events Continued

Friday- Day 5	Monday- Day 6	Tuesday- Day 7
<p>Summary: Mini-lesson, review the organelles within a cell and their function, watch a video of a 3d cell model</p> <p>Activities: Students work in pairs to create a cell model out of jello and candies</p> <p>Assessment: Students' ability to properly match and label candies to organelles in the model cell</p>	<p>Summary: Students work in groups to develop a board game based upon the knowledge of a cell</p> <p>Activities: Students work in heterogeneous groups of 3 to 4 to create the game. The roles include fact writer, designer, artist, and timekeeper</p> <p>Assessment: Board game produced and interaction with peers</p>	<p>Summary: Students take a field trip to the science museum</p> <p>Activities: Interact with the cell lab at the science museum</p> <p>Assessment: Students' reflections about the trip in their journals, students complete choice board today</p>

Cell Choice Board

Explore the interactive cell model on the website below. Explore the plant and animal cells. Describe differences you see.

http://www.cellsalive.com/cells/cell_model.htm

Create a brochure that describes a journey through a cell. You must explain the function of each organelle and its location. Be sure to include text and pictures.

In a group of no more than 4 students, compose and act out a short play about cells. Each student must participate in the play, each student should take on the roll of a different organelle.

Create a diorama to represent the inside of a cell. You may use any materials you can find around the classroom. Be sure to label each organelle and provide a brief description of its function.

Unit Test

What are the key differences between plant cells and animal cells? Complete a poster sized Venn diagram comparing the two.

Compose a poem from the perspective of a cell. Be sure to include details about organelles and cell structure.

Choose two organelles to research. Write a sample dialogue between the two. In the dialogue imagine the two are arguing over whom is more important for the cell.

Who discovered the cell? Research who discovered the cell and write a newspaper article about the discovery. Be sure to indicate what time period the newspaper is set in.

Choice Board Directions

- Directions: After learning about Cell Structure and Function, please challenge yourself by completing one activity in each color. If you have completed one activity in each color already, choose another activity that you will enjoy. Work on the choice board activities a little bit each day, it's due the 2nd Friday of our unit.

Bloom's Taxonomy

	Knowledge	Comprehension	Apply	Analyze	Synthesize	Evaluate
Tactile/Kinesthetic	Draw cell from microscope observations	Create a diorama to represent a cell	Create a cell model out of jello and label	Cell lab at the museum	Create a board game	Complete a poster size Venn diagram
Verbal/Linguistic	Write definitions and recall meaning of organelles	Unit Test	Write questions for board game	Compose a dialogue	Answering essential questions	Reflections in journal
Visual	Watch a video of a 3d cell model	Create a board game	Explore interactive cell model	Illustrate a board game	Design a diorama to represent a cell	Interpret a 3d model and write a reflection

Available Resources

- School Librarian
- SmartBoard
- Classroom Computers
- Speech to text software
- Microscope
- Cell Lab at the Science Museum
- Internet access that allows use of educational videos, online games, and online encyclopedias and search engines

Materials Used

- Posterboard
- Construction paper
- Shoeboxes
- Jello
- Candy
- Journals
- Rubric
- Books

Incorporation of Technology

- Power Point of Key Terms using a smart board to highlight and circle key points and add facts
- Microscope
- Cell lab at museum
- Virtual tour of cell
- Listening stations
- Interactive cell online
- Computers in the classroom with internet access to allow educational videos, vocabulary slideshows and online encyclopedias
- Speech to text software
- Smart Board

Rubric for Board Game

	4	3	2	1
Directions	Directions are clear and easy for the players to understand	Directions are clear with little area for confusion	Directions can be followed with few errors	Directions are too difficult to comprehend
Questions/Content	Content of the game reflects a high understanding of cell structure and function	Content of the game reflects an understanding of cell structure and function	Content of the game reflects some understanding of cell structure and function	Content of the game reflects confusion and misinterpretation of cell structure/function
Design	Design is clean and reflects understanding of content	Design reflects understanding of content	Design reflects some understanding of content	Design reflects little to no understanding of content

Literature

- Enjoy Your Cells by Francis Balkwill
- Pioneers in Cell Biology by Elizabeth Cregan
- Cell Biology by Audrey Stimola
- The Basics of Cell Life with Max Axiom by Amber J., Ph.D. Keyser, Cynthia Martin and Barbara Schulz
- Cell Wars by Francis Balkwill
- Mighty Animal Cells by Rebecca L. Johnson
- I Know How My Cells Make Me Grow by Kate Rowan

Unit Exit Card

1. Write 5 things you learned throughout this unit.

_____, _____, _____
_____, _____

2. What project/activity gave you the most difficulty?

3. What is a component of the unit your would like to learn more about?

4. What project/activity did you enjoy the most?

5. Are there any questions you still have after this lesson that still remain unanswered?

References

- "Assessment - Exit Cards." *Saskatchewan Schools and School Divisions*. N.p., n.d. Web. 22 Apr. 2011. <<http://www.saskschools.ca/curr>>
- "Cell Functions." *BiologyJunction*. N.p., n.d. Web. 20 Apr. 2011. <<http://www.biologyjunction.com>>
- "Cell Models: An Interactive Animation." *Home of CELLS alive!*. N.p., n.d. Web. 2 May 2011. <<http://www.cellsalive.com/cells/cell>>
- "Choice Boards." *Dare to Differentiate*. Web. 24 Apr. 2011. Retrieved from daretodifferentiate.wikispaces.com
- "Museum's Cell Lab helps kids discover science | kare11.com." *Minneapolis and St. Paul, MN | News, Weather and Sports | kare11.com*. N.p., n.d. Web. 2 May 2011. <http://www.kare11.com/news/simplyscience/science_article.aspx?storyid=849943&catid=231>.
- "The Virtual Cell." *ibiblio - The Public's Library and Digital Archive*. N.p., n.d. Web. 24 Apr. 2011. <<http://www.ibiblio.org/virtualcell/tour>>