

Students of Integrated Science! Below is a list of factual concepts in Biology which will be covered next year. Each student is required to choose one (1) of these item topics of discussion for 2017-18. The student will then produce a video (**file type .mov**) not exceeding 3 minutes in length that demonstrates your research on the topic. No more than two (2) students in a given class can have the same topic.

First, the video will need to be planned using a storyboard, and this storyboard must be submitted to your Integrated Science teacher during the last week of classes (exact date determined by your instructor). Exceptional productions will show the following: a demonstration, discussion regarding an equation, experiment, and/or presentation of student-collected observations.

Get creative! Your video will be used as an introduction for the unit that we investigate in the upcoming year.

A rubric of grading is also provided to help show you expectations for an exemplary, proficient, or poor grade.

Your final video submission will be due September 11th, 2017. Your Biology teacher for next year will setup a DropBox for submittal during the first week of school.

<u>TOPIC</u>
<p>Protein metabolism Research metabolic breakdown for proteins (consider performing a simple experiment by putting a spoonful of peanut butter in your mouth for 30 seconds and describe what is occurring) Define: structure of the macromolecule including monomer and polymer, uses in the human body, and chemical properties</p>
<p>Lipid metabolism Research metabolic breakdown for lipids Define: structure for the macromolecule, uses in the human body, and chemical properties</p>
<p>Carbohydrate metabolism Research metabolic breakdown for carbohydrates (consider performing a simple experiment by putting a cracker in your mouth for 30 seconds and describe that is occurring) Define: structure for the macromolecule including monomer and polymer, uses in the human body, and chemical properties</p>
<p>Enzyme function Research the roles of pepsin and amylase in digestion (consider making a model that demonstrates the fit between an enzyme and substrate) Define: substrate, activation site, and activation energy</p>
<p>Evolution Research the changes occurring to decibel level changes within rattlesnakes in North America Define: variation, fitness, adaption, and natural selection</p>
<p>Genetics</p>

Research the discoveries of Rosalind Franklin, James Watson, Francis Crick, and Erwin Chargaff on the shape of DNA

Define: adenine, thymine, guanine, cytosine, double helix, and nucleotide

Sickle Cell Anemia Genetic Disease Heredity

What are the symptoms and treatment of sickle cell anemia? Research how dominance and recessive genes work. How does someone inherit sickle cell anemia? What is the probability of an offspring inheriting sickle cell anemia if mom and dad are both carriers of the disease? Use numerical data to back your findings.

Define: Dominant gene vs. recessive gene, Mendel

Tay Sachs Genetic Disease Heredity

What are the symptoms and treatment of tay sachs disease? Research how dominance and recessive genes work. How does someone inherit tay sachs disease? What is the probability of an offspring inheriting tay sachs disease if mom and dad are both carriers of the disease? Use numerical data to back your findings.

Define: Dominant gene vs. recessive gene, Mendel

Cystic Fibrosis Genetic Disease Heredity

What are the symptoms and treatment of cystic fibrosis? Research how dominance and recessive genes work. How does someone inherit cystic fibrosis? What is the probability of an offspring inheriting cystic fibrosis if mom and dad are both carriers of the disease? Use numerical data to back your findings.

Define: Dominant gene vs. recessive gene, Mendel

Plant Cell

Research how termites and cows breakdown cellulose

Define: chloroplast, chlorophyll, central vacuole, cell wall, beta glucose, enzymes

Animal Cell

Research the methods of chemical communication exhibited by cells using their extracellular matrix

Define: proteoglycan, fibronectin, integrin, plasma membrane, collagen

Plant Transport Systems

Research the purpose of tracheids and phloem in dicots, more specifically evergreens.

Define: tracheids, phloem, sieve cells, companion cells, dicot, monocot, cork, and xylem

Reptilian Circulatory System

Research the pathways of blood through the reptilian circulatory system and how it influences their ability to survive in their given environment

Define: structure of the heart, different types of vessels, how blood is oxygenated

Mammalian Circulatory System

Research the pathways of blood through the mammalian circulatory system and how it influences their ability to survive in their given environment

Define: structure of the heart, different types of vessels, how blood is oxygenated

Fish Circulatory System

Research the pathways of blood through the reptilian circulatory system and how it influences their ability to survive in their given environment

Define: structure of the heart, different types of vessels, how blood is oxygenated

Intersexual Selection

Research 3 organisms that exhibit this type of selection

Define: the environment of the organism (population size, predators, terrain), physical differences between male and females, methods of competition

Intrasexual Selection

Research 3 organisms that exhibit this type of selection

Define: the environment of the organism (population size, predators, terrain), physical differences between male and females, methods of competition

Mitosis

Research the role of cytokines and kinases in the regulation of cell growth

Define: G1 phase, G2 phase, G0 phase, S phase, interphase, M phase

Aerobic Fermentation

Research aerobic respiration regarding the conversion of glycogen in to energy

Define: glycolysis, Citric Acid cycle, and the electron transport chain

Anaerobic Fermentation

Research anaerobic respiration in yeast (consider performing a simple experiment using yeast cells, differing amounts of sugar and/or differing temperature of water)

Define: lactic acid, carbon dioxide production, glycolysis, pyruvate

Photosynthesis

Research the difference in the conversion of carbon dioxide in C4 plants vs. C3 plants. Be sure to define the varying environments that these two types of plants can be found

Define: rubisco, PEP carboxylase, Calvin Cycle, plasmodesmata, mesophyll cells, bundle sheath cells, stomata

Marine/Freshwater organisms

Research the difference in how freshwater and marine organisms regulate internal water and solute concentrations.

Define: osmosis, diffusion, active transport, passive transport

Activity	Exemplary	Proficient	Poor	Points
Storyboard and Plan: May 2017	<p>The storyboard illustrates the video presentation structure with thumbnail sketches of each scene. Notes of proposed transition, special effects, sound and title tracks include: text, background color, placement & size of graphic, fonts - color, size, type for text and headings. Notes about proposed dialogue/narration text are included.</p> <p>The proposal is well written; addresses all necessary components in detail with a clear understanding of the message the student must convey.</p>	<p>The storyboard includes thumbnail sketches of each video scene and includes text for each segment of the presentation, descriptions of background audio for each scene, and notes about proposed shots and dialogue.</p> <p>The proposal shows the details of the project, including all requested components.</p>	<p>The thumbnail sketches on the storyboard are not in a logical sequence and do not provide complete descriptions of the video scenes, audio background, or notes about the dialogue.</p> <p>The proposal doesn't explain the project focus or convey an understanding of the direction the student wishes to take with his concept</p>	Max 20 pts
Media Presentation Part 1: September 2017	<p>Strong message. Covers topic completely and in depth. Includes complete information.</p>	<p>Message is vaguely communicated. Includes some essential information with few facts.</p>	<p>Message is unclear. Includes little essential information and one or two facts.</p>	Max 50pts
Media Presentation Part 2: TBA	<p>The content includes a clear statement of purpose or theme and is creative, compelling, and clearly written. A variety of supporting information in the video contributes to understanding the project's main idea. The project includes motivating questions and information that provide the audience with a sense of the presentation's main idea. Events and messages are presented in a logical order. The audience was clearly engaged and clearly understood the information.</p>	<p>Information is presented as a connected theme with accurate, current supporting information that contributes to understanding the project's main idea. The audience's perception of the presentation as unclear though they did grasp the underlying primary concept.</p>	<p>The content lacks a central theme, clear point of view and logical sequence of information. Much of the supporting information in the video is irrelevant to the overall message. The viewer is unsure what the message is because there is little persuasive information and only one or two facts about the topic. Information is incomplete, out of date and/or incorrect. Audience was unable to grasp the information and did not understand the direction of the presentation.</p>	

Part 1: Proposal and Storyboard – Due the last week of classes (exact date determined by your current science instructor)

Video Project Proposal – The Pitch

- Form an idea that has depth and substance.
- Have a good grasp on the main idea, the information, the structure of the presentation, and the use of your creativity in conveying the message.
- Consider creating a presentation to better explain your idea to the class and involve some type of demonstration/real life example. This will also help you to be focused and stay on track.

Be specific and to-the-point.

Video Title:

Video Style: (narrative, demonstration, voice over with photographs)

Target Audience:

Video Goals & Objectives - What does the video aim to teach?

1. What is the purpose? (Why have you chosen this style of presentation to convey your information? Will it show/or explain the facts through narration solely? Will it demonstrate something—what?)
2. Describe the content of your video. (Briefly describe what you expect your project to be about. What is the goal of the message you wish to convey? Identify the critical information to be presented.)

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