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 2018-19. 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 10th, 2018. Your future Biology teacher will have a FlipGrid account setup for you to either record your video right through the website or download it (.mov) from a device which you produced your video. Please wait until the rosters come out in August to submit your video to your assigned science teacher of 2018.

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| TOPIC |
| 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  Lipid metabolism  Research metabolic breakdown for lipids  Define: structure for the macromolecule, uses in the human body, and chemical properties  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    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    Evolution  Research the changes occurring to decibel level changes within rattlesnakes in North America  Define: variation, fitness, adaption, and natural selection  Genetics  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 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                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 | |

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| Activity | Exemplary | Proficient | Poor | Points |
| Storyboard and Plan:  May 2018 | 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.  The proposal is well written; addresses all necessary components in detail with a clear understanding of the message the student must convey. | 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.  The proposal shows the details of the project, including all requested components. | 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.  The proposal doesn’t explain the project focus or convey an understanding of the direction the student wishes to take with his concept | Max  20 pts |
| Media Presentation Part 1: September 2018 | Strong message. Covers topic completely and in depth. Includes complete information. | Message is vaguely communicated. Includes some essential information with few facts. | Message is unclear. Includes little essential information and one or two facts. | Max  50pts |
| Media Presentation Part 2: TBA | 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. | 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. | 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. |  |

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.)

