***The Colonization of Another Planet***
***Project Outline***

Your group challenge is to design a plan for colonizing a planet. Because this is the first mission, you will be planning for 8 people.  Listed below are a series of topics to research.  Each member must choose 2 questions to research from the list below.  That means that if someone asks a member of your group about one of their questions, they will be able to answer correctly and tell others where they found their information.

General directions:
1. Each group must choose a total of SEVEN topics from Part A.
2. Each group member will create their own research notes from the topics they each choose. These research notes will be handed in and counted as part of your *individual* mark.
3. When all members have finished with their research notes, members should discuss their findings. If you believe you need more information or if some of the information does not seem correct, then you need to do more research!
4. When your group is satisfied that all the information that you have collected is accurate, groups will work together to create slides to sum up and showcase their research. These slides will be counted as part of your *group* mark.
\*\* Individual marks will be given as a combination between individual and group work.
\*\* Remember to write neatly, use proper grammar, think creatively, collect and report information accurately, and report every place you used to find information.
5. You will present your information in a **Gallery Walk on Thursday December 20th.**

Your Schedule to complete the project is as follows:

**Wednesday December 12, 2018**

* Assign two questions to each person (each person will answer 2 mandatory questions) and one optional question (either one person will take this on or work on this collaboratively).
* As a whole group determine which celestial body you will colonize. You will need to scientifically justify your answer.

**Thursday December 13, 2018**

* Each person in your group must have their **first** mandatory question researched by the end of class.

**Friday December 14, 2018**

* Each person in your group must have their **second** mandatory question researched by the end of class.
* Over the weekend, determine how your group will research answer the last question. All research must be completed by the end of the weekend.

**Monday December 17, 2018**

* Teach your group about the questions you have researched. Each person should take notes on the key ideas to use as study notes.
* As you discuss the information, make sure you question the research (e.g. will this idea work? If not, why and how can it be improved? Is there any missing components or research).
* Decide as a group how you will compile Google Slides or a presentation.

**Tuesday December 18, 2018**

* Work on presentation slides.

**Wednesday December 19, 2018**

* Complete your presentation. Every person in your group must be able to answer questions on any of the slides during tomorrow’s gallery walk.

**Thursday December 20, 2018**

* Gallery Walk presentation

# Part A: The Research Topics:

1. Getting off of Earth takes a lot of power and propulsion. Describe the stages of a rocket and how you would use them to get into orbit and then how you would gain speed to continue on your journey.\*

Resources to get you started:

* Bill Nye Space Shuttle: <https://www.youtube.com/watch?v=j2iZzUzB89M>
* Rocket Staging <https://www.youtube.com/watch?v=IJtOXekIQv4&t=11s>
* Apollo 11’s Journey to the Moon: <https://www.youtube.com/watch?v=OCjhCL2iqlQ>
1. Describe what planet OR moon you think would be best to establish a colony and why? Create a pros and cons chart of living on each of the eight planets of our solar system\*
2. You are responsible for selecting the eight candidates on the mission. Each member must have expertise in a particular area. Describe the expertise that each candidate will bring and how he or she will contribute to the collective strength of the group. E.g. Candidate One- Botanist: Expertise needed in order to…\*

Create a profile for each candidate (picture of the person and the qualifications, name, occupation and experience). This should take the form of a Facebook or Instagram page for each person.

1. Once established on your planet, what types of satellites will be deployed? What do these satellites do?  How do they move in respect to Mars? (optional)

Satellites: From Sputnik to Today: <https://www.dailymotion.com/video/x4xegxp>

1. Space Exploration from your planet: What will the sun look like from your colony and why would it look like it does? Does your planet have any moons that can be observed? Describe the composition of these moons. Draw a scale diagram of the Sun to your planet and the surrounding moons. (optional)
2. How will you deal with waste management such as garbage and bodily functions both in flight and on your planet? Why is this important?\*
3. How will you obtain oxygen both in flight and on your planet? Explain your answer...\*
4. How will you get food and water both in flight and on your planet? Explain your answer? How much water will you need, how will the human diet on your planet differ from the diet on Earth? (optional)
5. What do plants need in order to survive and grow?  Would the soil on your planet support plant life?  If not, why?  What would you need to do in order to get plants to grow on your planet? (optional)

Scene from the Martian (growing potatoes): https://www.youtube.com/watch?v=BAoadypFBQ4

Potatoes can grow in 'extreme' Mars-like conditions, a new NASA-backed experiment shows: https://www.businessinsider.com/potatoes-mars-growth-cubesat-experiment-2017-3

1. How would you move about the surface of your planet given that the force of gravity there will likely be very different? Describe the force of gravity on your planet. How this will affect the health of colonizers and how can you minimize these health effects?\*

Resources to get you started:

NASA Twins Study Verifies Long-Term Health Effects of Space Travel: https://www.space.com/39952-nasa-twin-study-spaceflight-health-effects.html

How Scott Kelly's year in space may have changed his body: https://www.theverge.com/2016/3/1/11138102/scott-kelly-year-in-space-health-effects-return-to-earth

1. Would you be able to breathe the air on your planet or would you need to use a spacesuit?  If you need a spacesuit, draw a picture of the suit and label the parts of the suit in terms of how it will protect you from the harsh environment of space.\*
2. What materials would you use to build your shelters? What designs would best withstand the radiation, winds and temperatures there? How can you create a shelter that will sustain human life? Explain. (optional)
3. How would you communicate with Earth? Explain what elements of the electromagnetic spectrum would be used and show your calculations to determine how long it will take for your messages to reach Earth. (optional)