Project Ideas Pros and Cons

|  |  |  |
| --- | --- | --- |
| Experiment | Pros | Cons |
|  **Sound and/or vibrations** (does micro gravity affect the way sound travels and do different metals vibrate at the same frequency in microgravity and 1g | 1. Not alive so no need to figure out a way to have someone open the ArduLab before launch.2. All recordings can be on one device3. Could include a second small experiment measuring the vibrations of various metals.3. Can measure and record data. | 1. mini mp3 player uses batteries but could find a way to wire directly to the Arudrino board. *http://www.sandisk.com/products/music-video-players/clip-zip/*2. sound level sensors are at least 6 inches but could use voltage to determine3. the decibel levels could be too loud for the astronauts4. Could be a very short experiment even with multiple trials |
| Do different materials have the produce the same amount of **static electricity** in a microgravity environment | 1. Not alive so no need to figure out a way to have someone open the ArduLab before launch.2. Can have 2 servo motors in case one fails. | 1. Uses water so the water must be triple contained and collecting it after use may be challenging2. Has moving parts that could fail3. Could be a very short experiment even with multiple trials.4. the existing electrostatic field sensors are too large and require too many batteries for the Ardulab. *http://www.prostatcorp.com/Electrostatic-Field-Meter-Micro-Kit* |
| Do **plants “fix” nitrogen** quicker/more effectively in microgravity? | 1. could start from seeds so would not have to have live material added to the ArduLab2. Could measure plant growth with a “grid” system and a camera. | 1. Living material- how to keep the plants alive.2. Watering system could be difficult3. Water has to be triple contained.4. Measuring the nitrates produced may be very difficult- the meter requires a drop of the liquid to be placed on the meter. *http://www.horiba.com/us/en/application/material-property-characterization/water-analysis/water-quality-electrochemistry-instrumentation/compact/details/b-741-742-743-laquatwin-compact-nitrate-meter-17167/*5. Measuring the root growth may be very difficult depending on the growing media chosen. |
| Does **light level** have the same effect on **plants** in microgravity? | 1. Easy to get LED’s in different colors or types such as UV and infrared. 2. Could start with seeds or bulbs so live plants do not have to be loaded into the ArduLab at the launch area by others.*http://plants.usda.gov/core/profile?symbol=meof*3. Light level easy to measure.4. Growth could be measured with a “grid” and a camera. | 1. Living material- how to keep the plants alive.2. Watering system could be difficult3. Water has to be triple contained.4. Dividing the ArduLab into 2 or 3 parts. |
| Does a helpful mold such as **Penicillium** grow more rapidly in microgravity? | 1. Could start with spores. | 1. May be too high on the MSDS 2. Providing the growing media may be extremely challenging.3. Measuring growth rate may be very difficult. |

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ballot for 8th grade Experiment

**Circle ONE** then list 2 or 3 reasons for your selection and how to overcome a challenge

**Sounds/Vibrations**

**Static Electricity**

**Nitrogen fixing plants**

**Light Level/light type and plant growth**

**Penicillium growth**

Reasons

1)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How to overcome one or more of the challenges with this experiment

1)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_