Procedural Plan

Name_**Arjun Afiniwala**_____ **Due date: 11/7/23**

What is the question to be investigated? **Can the use of cleaning supplies help support the 5 second rule?**

What is your research? (this should be the paraphrased research from your research document and should be 1 or 2 cohesive paragraphs with correct spelling & grammar). Include an engineering goal if applicable.

For the researchers' five second rule and disinfectant experiment, the experimenters' research found that an unopened box of donuts is the best food to drop on the floor due to its slightly acidic pH (Channahai Paragraph 1) which attracts bacteria (fdcas paragraph 1). It is best to let bacteria sit on the agar plates for 5 days for peak condition of bacterial growth. (Study paragraph 2). To count the bacterial colonies on the plates, Use an app known as "Oculyze," which is reliable and has great efficiency (Oculyze Section 2, Paragraph 1-2). After this, the experimenter will analyze the data they have collected, and approve or disprove the hypothesis. I think that the 5 second rule will not be scientifically proven and the amount of bacteria for a non-disinfectant treatment would be very high (MaCallum paragraphs 16, 21) .

What is the hypothesis? (Use an "If…then…" statement)

If the food is put on the ground for only 5 seconds and Clorox is sprayed on the location it is dropped on, then the amount of bacterial colonies will be significantly less then other disinfectants.

What is the independent variable?	What is the dependent variable?
Time and disinfectant	**# of bacterial colonies**

What are the levels of the I.V. to be tested?

Time and disinfectant treatment
Time: list here
Disinfectant: list here

- **Lysol**
- **Clorox**
- **Pine Sol**
- **Home disinfectant treatment**
- **No treatment**

How many replicates of each level will be tested?

3 replicates of 10 levels (5 times stamps, 5 treatments)

What are the constants in the experiment?

Time rested on the agar plates, location, sterilized swabs, the app used to count the amount of bacterial colonies which are sealed in the same type of agar plates, same food being tested.

What will be the control group?

0 seconds on the floor

What kinds of materials are needed to run the experiment?

- **Agar Plates**
- **Sterilized Cotton Swabs**
- **Donuts**
- **Oculyze app**
- **Timer**
- **Disinfectants (homemade or purchased)**
- **Lysol**
- **Clorox**
- **Pine Sol**
- **No treatment**
- **Homemade disinficent**

What kind of location or setting is needed to run the experiment?

An open- spaced and secure environment, inside would be the most ideal, either on a floor or counter.

Risk and Safety: Identify any potential risks and safety precautions needed.

- **Spraying chemicals into eyes: wear goggles**
- **Chance of being contaminated by bacteria: wear protective clothing and gloves**
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Describe the procedure for the experiment. This must be numbered step by step details. Do NOT use paragraph format. (use additional paper if needed)

1. **Make the home disinfectant using ½ cup of vinegar, and 3 lemon rinds mixed together. Let that sit outside in an air sealed container for 24 hrs, strain out lemon rinds, and mix in some water on top, transfer to a spray bottle, keep ready.**
2. **Label agar plates list labels and numbers. Describe in detail the number of plates and labels.**
3. **Keep sterilized cotton swabs open on the side ready for use**
4. **Wipe down the floor with dry paper towel to get rid of dust or crumbs**
5. **Take the 1st donut and swab the bottom part of it, then rub the swab on the 1st labeled plate named control agar plates (this is the control group)**
6. **Cover plate and store on tray**
7. **Repeat step 5 and 6 for 2 more times**
8. **Now drop a new donut piece on the floor for 5 seconds with no treatment, 3 times. Repeat the steps for the 5 second interval with Pine Sol, Clorox, Lysol, and the Homemade Disinfectant treatments. Repeat all 5 of these treatments 3 times for the following time stamps 10, 15, 30, and 60 seconds. Note, for each disinfectant, use a different part of the floor to avoid cross contamination. (spray each substance on different parts of the floor so chemicals do not mix)**
9. **Once step 7 is done, set a timer for 3-5 days to let the sample rest on the agar plates.**
10. **After 3-5 days, use the Oculyze app to count the bacterial colonies on each plate.**
11. **Record & Analyze Data.**

Data Analysis: Describe the procedures you will use to analyze the data/results.

1. **After I find the number of bacterial colonies for all the tests I will make a data table and jot down my data**
2. **Mean**
3. **Data table**

4. **I will then create a graph with the x axis as the time and y as the # of colonies, I would have 5 lines representing my different treats**

Parent Signature_____**Swara Afiniwala** _____ Date **11/16/23**_____

Teacher Signature _____ Date _____

**No experimentation may be started until all signatures are obtained.

Time	No txt1	No Txt2	No Txt3	No Txt Avg	Lysol Txt1	Lysol txt2	Lysol txt3	Lysol txt avg	Clorox txt1	Clorox txt2	Clorox txt3	Clorox txt avg	PineSol txt1	PineSol txt2	PineSol txt3	PineSol txt avg	Home txt1	Home txt2	Home txt3	Home txt avg
O sec																				
5 sec																				
10 sec																				
15 sec																				
30 sec																				
60 sec																				