(5 sec)	Trial 1.	Trial 2	Trial 3
1 Nov 26	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	1	2
6	1	2	2
7	2	3	3
8	2	5	5
9	3	16	7

Project Question:
Is the 5 second rule accurate (~~true~~ true) ~~matter~~ and does the amount of time dropped food stay on the floor effect the amount of bacteria?

FOOD: apples.

Manipulate Variable.
- 5 secs - controlled
- 10 secs
- 15
- 30 -

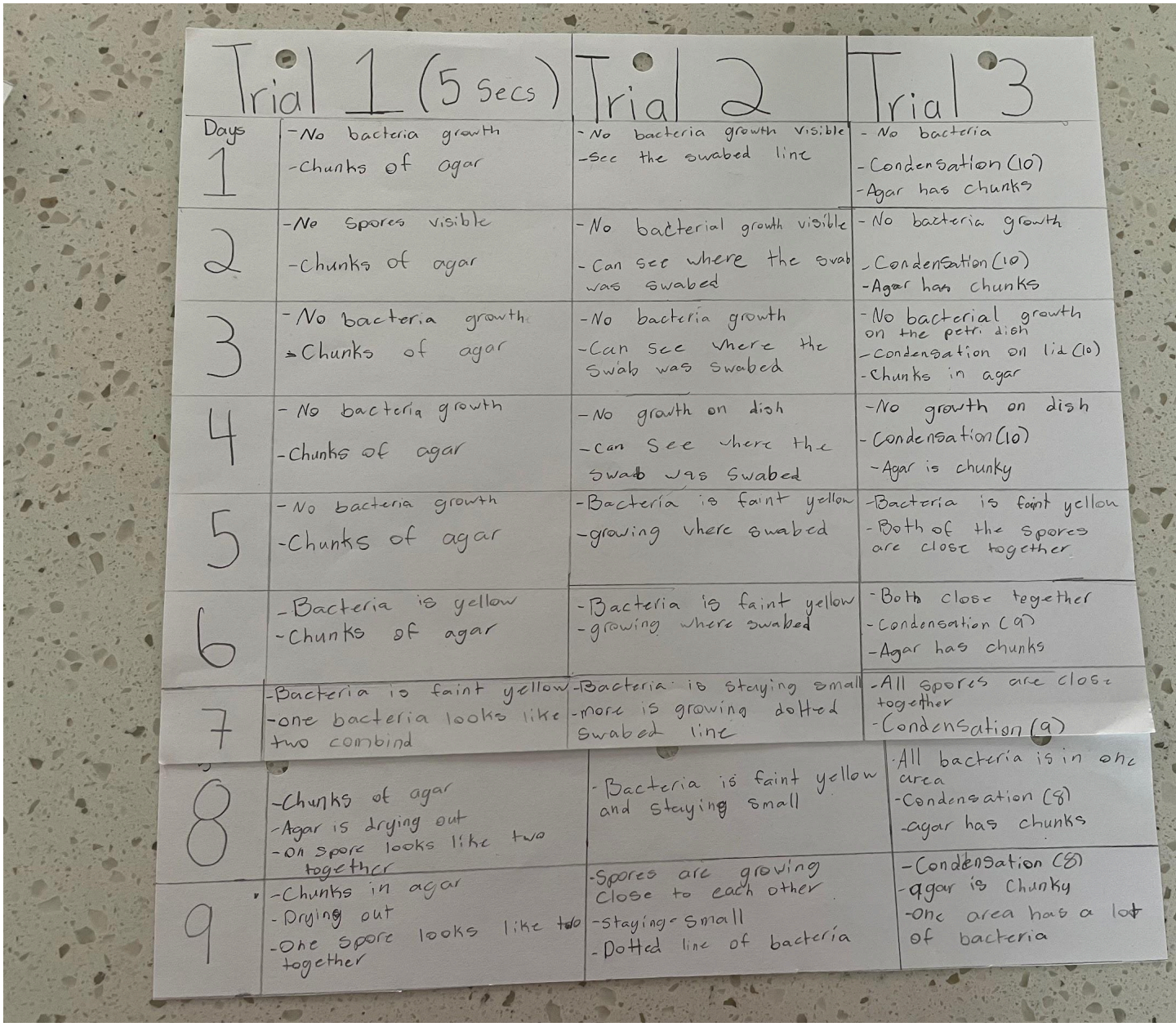
If I drop apples on the floor for 5 seconds, 10 seconds, 30 seconds then the apples on the floor for 30 seconds will have the most bact. because the apple will be exposed to the bacteria for longer-

Variables:
amount time
- Dirty floor vs clean floor.

Materials
- sterile gloves
- petri dish
- agar
- q-tips
- *~~possibly make? heat lamp~~ cardboard box + heat lamp
- microscope?
- apples
- tile / spot on floor
- incubator for petri dishes.*
- stop watch.

Nov 26 Dggs (No Time)	Trial 1	Trial 2	Trial 3
1	0 Spores	0	0
2	0 Spores	0	0
3	0 Spores	0	0
4	0 Spores	0	0
5	0 Spores	0	1
6	0 Spores	0	1
7	0 Spores	3	2
8	1 Spores	4	2
9	6 Spores	9	3

(10 Sec)	Trial 1	Trial 2	Trial 3
Nov 26 1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	1	1
6	1	1	2
7	3	8	2
8	7	10	2
9	15	12	5



Days	Trial 1 (5 secs)	Trial 2	Trial 3
1	-No bacteria growth -Chunks of agar	-No bacteria growth visible -See the swabed line	-No bacteria -Condensation (10) -Agar has chunks
2	-No spores visible -Chunks of agar	-No bacterial growth visible -Can see where the swab was swabed	-No bacteria growth -Condensation (10) -Agar has chunks
3	-No bacteria growth -Chunks of agar	-No bacteria growth -Can see where the swab was swabed	-No bacterial growth on the petri dish -Condensation on lid (10) -Chunks in agar
4	-No bacteria growth -Chunks of agar	-No growth on dish -Can see where the swab was swabed	-No growth on dish -Condensation (10) -Agar is chunky
5	-No bacteria growth -Chunks of agar	-Bacteria is faint yellow -growing where swabed	-Bacteria is faint yellow -Both of the spores are close together
6	-Bacteria is yellow -Chunks of agar	-Bacteria is faint yellow -growing where swabed	-Both close together -Condensation (9) -Agar has chunks
7	-Bacteria is faint yellow -one bacteria looks like two combind	-Bacteria is staying small -more is growing dotted swabed line	-All spores are close together -Condensation (9)
8	-Chunks of agar -Agar is drying out -On spore looks like two together	-Bacteria is faint yellow and staying small	-All bacteria is in one area -Condensation (8) -agar has chunks
9	-Chunks in agar -Drying out -One spore looks like two together	-Spores are growing close to each other -staying small -Dotted line of bacteria	-Condensation (8) -agar is chunky -One area has a lot of bacteria

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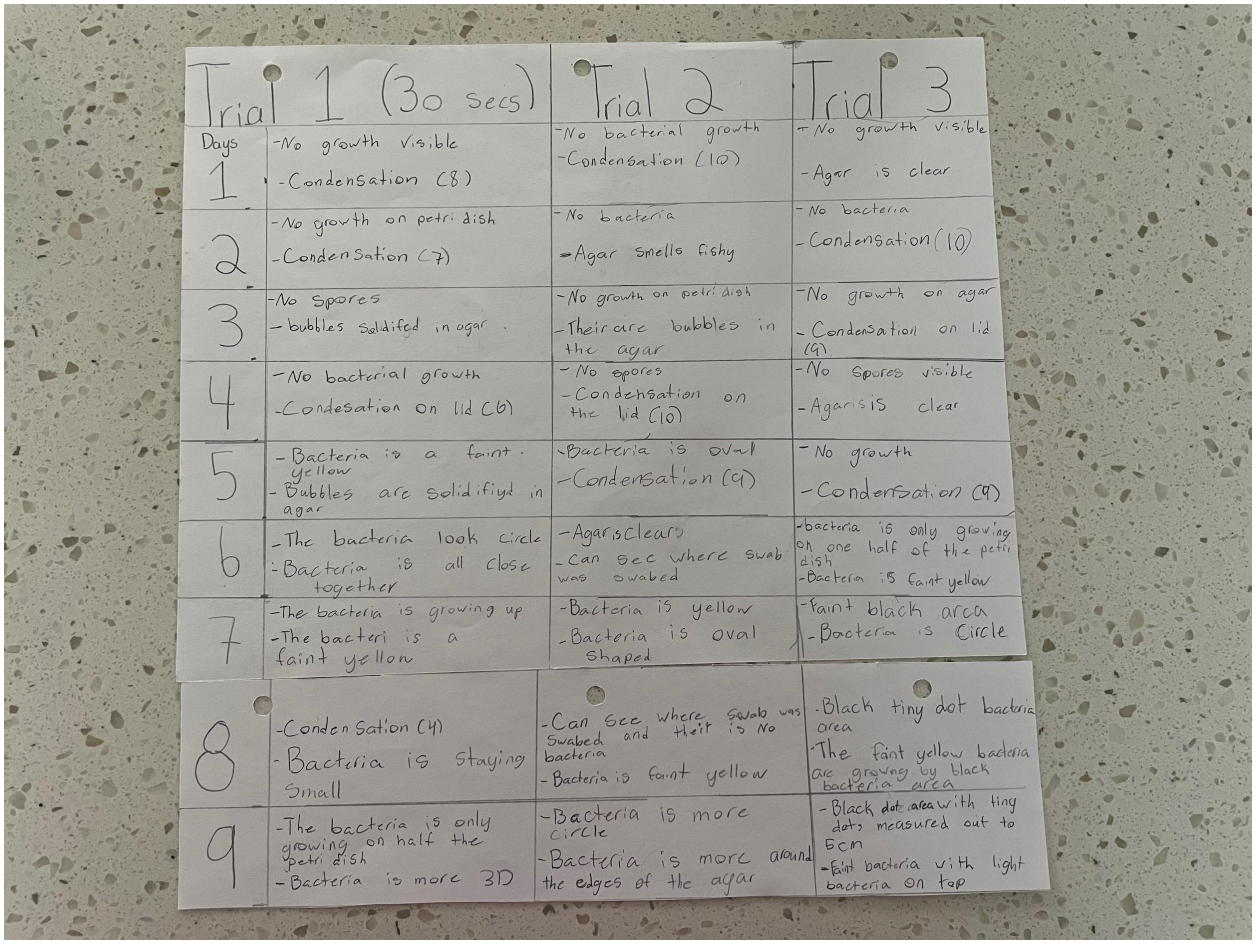

Days	Trial 1 (30 secs)	Trial 2	Trial 3
1	-No growth visible -Condensation (8)	-No bacterial growth -Condensation (10)	-No growth visible. -Agar is clear
2	-No growth on petri dish -Condensation (7)	-No bacteria -Agar smells fishy	-No bacteria -Condensation (10)
3	-No spores -bubbles solidifed in agar.	-No growth on petri dish -Their are bubbles in the agar	-No growth on agar -Condensation on lid (9)
4	-No bacterial growth -Condesation on lid (6)	-No spores -Condensation on the lid (10)	-No spores visible -Agar is is clear
5	-Bacteria is a faint yellow -Bubbles are solidifiyd in agar	-Bacteria is oval -Condensation (9)	-No growth -Condensation (9)
6	-The bacteria look circle -Bacteria is all close together	-Agar is clear -Can see where swab was swabed	-bacteria is only growing on one half of the petri dish -Bacteria is faint yellow
7	-The bacteria is growing up -The bacteri is a faint yellow	-Bacteria is yellow -Bacteria is oval shaped	-Faint black area -Bacteria is Circle
8	-Condensation (4) -Bacteria is staying small	-Can see where swab was swabed and their is no bacteria -Bacteria is faint yellow	-Black tiny dot bacteria area -The faint yellow bacteria are growing by black bacteria area
9	-The bacteria is only growing on half the petri dish -Bacteria is more 3D	-Bacteria is more circle -Bacteria is more around the edges of the agar	-Black dot area with tiny dots measured out to 5cm -Faint bacteria with light bacteria on top

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Quantitative Observations

Final day	Trial 1	Trial 2	Trial 3
No time	9	9	3
5 seconds	4	56	9
10 seconds	15	16	5
15 seconds	14	17	44
30 seconds.	41	27	15 and (5 cm)

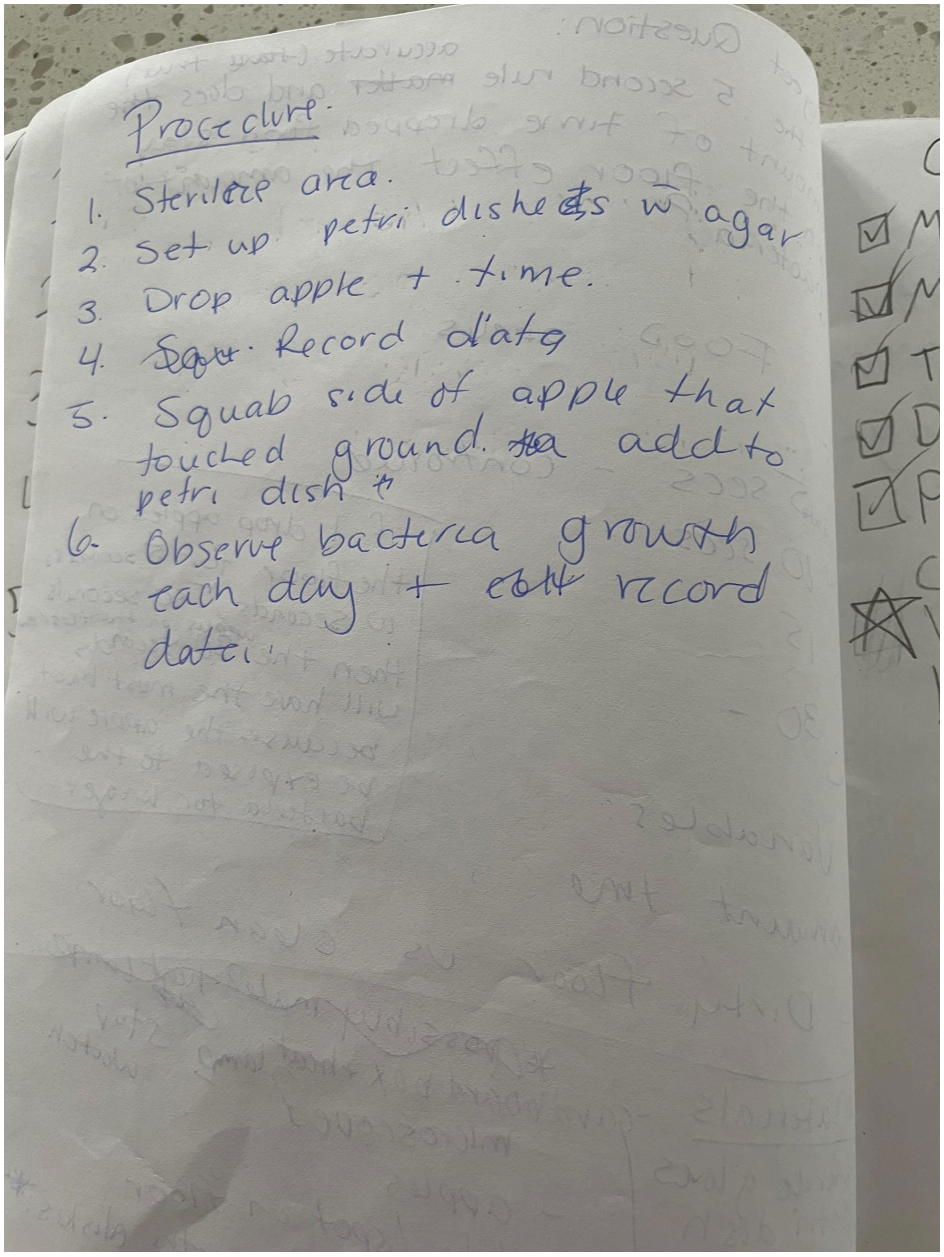
Days	Trial 1 (10 secs)	Trial 2	Trial 3
1	-No bacteria is visible on petri dish -Condensation (8)	-No growth -Condensation (6) -Strand of apple	-No bacterial growth -Condensation (8) -Chunks in agar
2	-No bacteria visible -Condensation (7)	-No growth visible -Strand of apple -Condensation (5)	-No growth visible -Condensation (7) -Agar is chunky
3	-No bacteria growth on agar (7) -Condesation on lid of petri dish (7)	-No bacterial growth -Condensation (4)	-No bacteria grow on dish -Condensation (7)
4	-No Bacterial growth -Condensation on lid (7)	-No growth on dish -Condensation (3)	-No bacteria on pe dish -Condensation (5)
5	-No bacteria visible on dish -Condensation (6)	-Bacteria is circle -Bacteria is growing by apple strand	-Bacteria is faint yellow -Condensation on lid (4)
6	-Bacteria is a faint yellow -Condensation on lid (6)	-Bacteria is faint yellow -Circle -Condensation (2)	-Bacteria is circle -Condensation (3)
7	-Bacteria is spread out -Condensation (5)	-Bacteria is circle -Strand of apple	-Agar is dryout -Chunky
8	-Bacteria is super spread out -Condensation (6) -Agar in middle of dish	-Bacteria is growing around apple strand -Condensation (1) -One bacteria looks like two	-Bacteria is spread out -Condensation (2)
9	-agar is only in the middle of petri dish -Condensation (5) -Bacteria is spread out	-Strand of apple -Spores growing in lines -One bacteria is growing on top of one	-Agar is drying o and peeling of th dish -Condensation (1) -Bacteria is circl

(30 sec)	Trial 1	Trial 2	Trial 3
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	3	1	0
6	3	2	2
7	8	4	10
8	12	5	10
9	13	15	11

Qualitative Observations

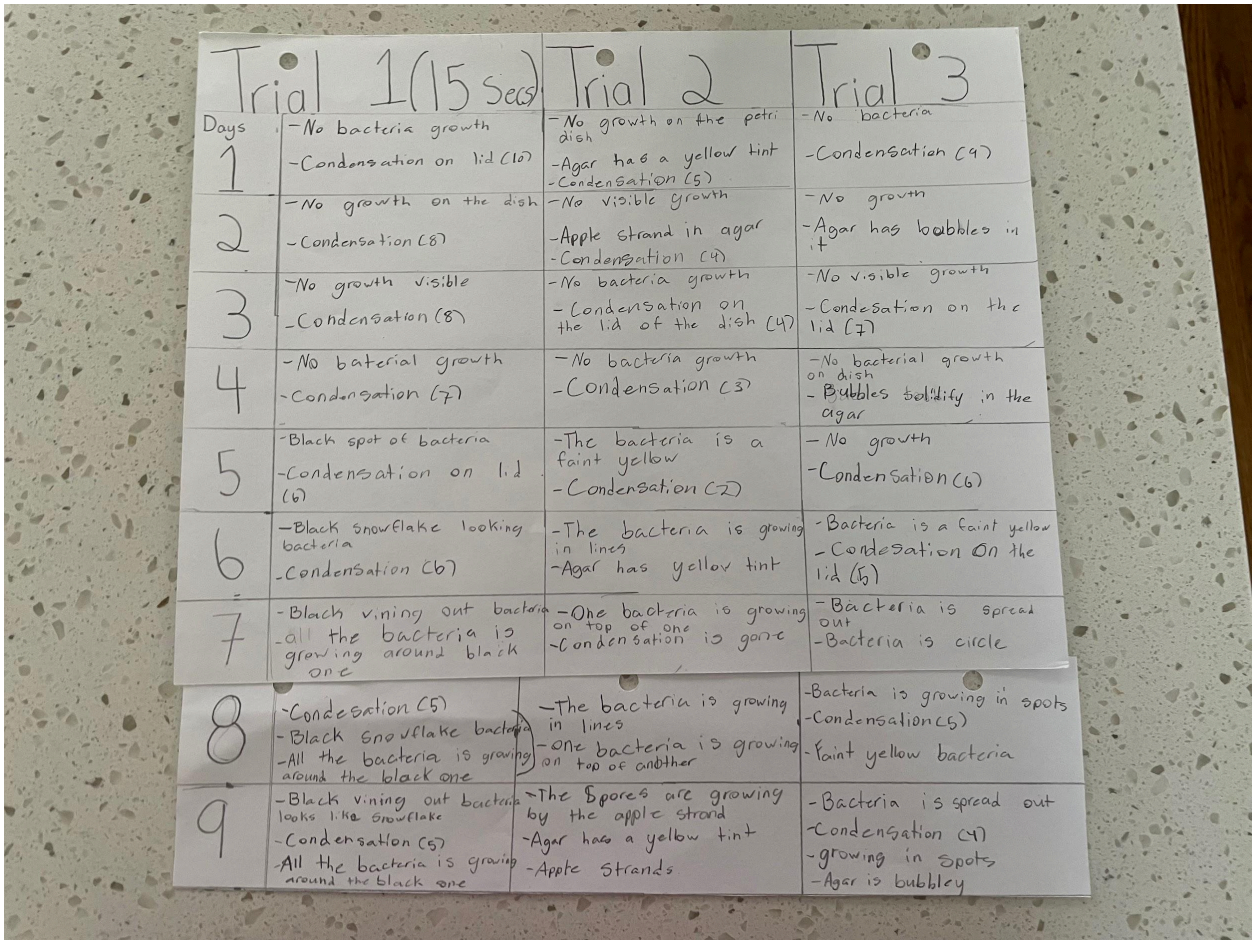
Final Day	Trial 1	Trial 2	Trial 3
No time	-Faint yellow bacteria -Condensation (8) around edge of agar	-The agar is drying out -Growing a line -Condesation (3)	-agar is chuncky -There is a strand of apple - 30 bacteria
5 seconds	-Chuncks in agar -Drying out -one spore that looks like 2	-Spores close to each other -Stay small -line of bacteria	-Condensation (8) -agar is chuncky -one area with lots of bacteria
10 seconds	-Condensation (5) -The agar solidified only in the middle -Bacteria is spread out	-small strands of apple -spores are growing in lines -one bacteria is growing on top of each other	-Condensation (1) -Dry out/peeling -chunks of agar
15 seconds	I 1 -most of the bacteria is growing around black one	-Condensation (4) -One bacteria is growing up -Black spore vining out	-Agar has yellow tint -Strand on apple -The bacteria is growing in lines -growing on top of big	-Condensation (4) -Bacteria is growing in spots -Spread out
30 seconds	-Condensation (3) -The bacteria is only growing on half -One bactdia is growing up	-Condensation (9) -Bacteria is circular -Bacteria is mahly on edges	-Condensation (7) -Black tiny dot area -one of the big bacterias that are faint yellow has a bright yellow bacteria

(15 Sec)	Trial 1	Trial 2	Trial 3
Nov 26 1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	1	1	0
6	1	1	1
7	2	2	4
8	6	15	10
9	12	17	11



Procedure:

1. Sterilize area.
2. Set up petri dishes w agar
3. Drop apple + time.
4. ~~Squa~~. Record data
5. Squab side of apple that touched ground. ~~the~~ add to petri dish *
6. Observe bacteria growth each day + ~~coll~~ record data.



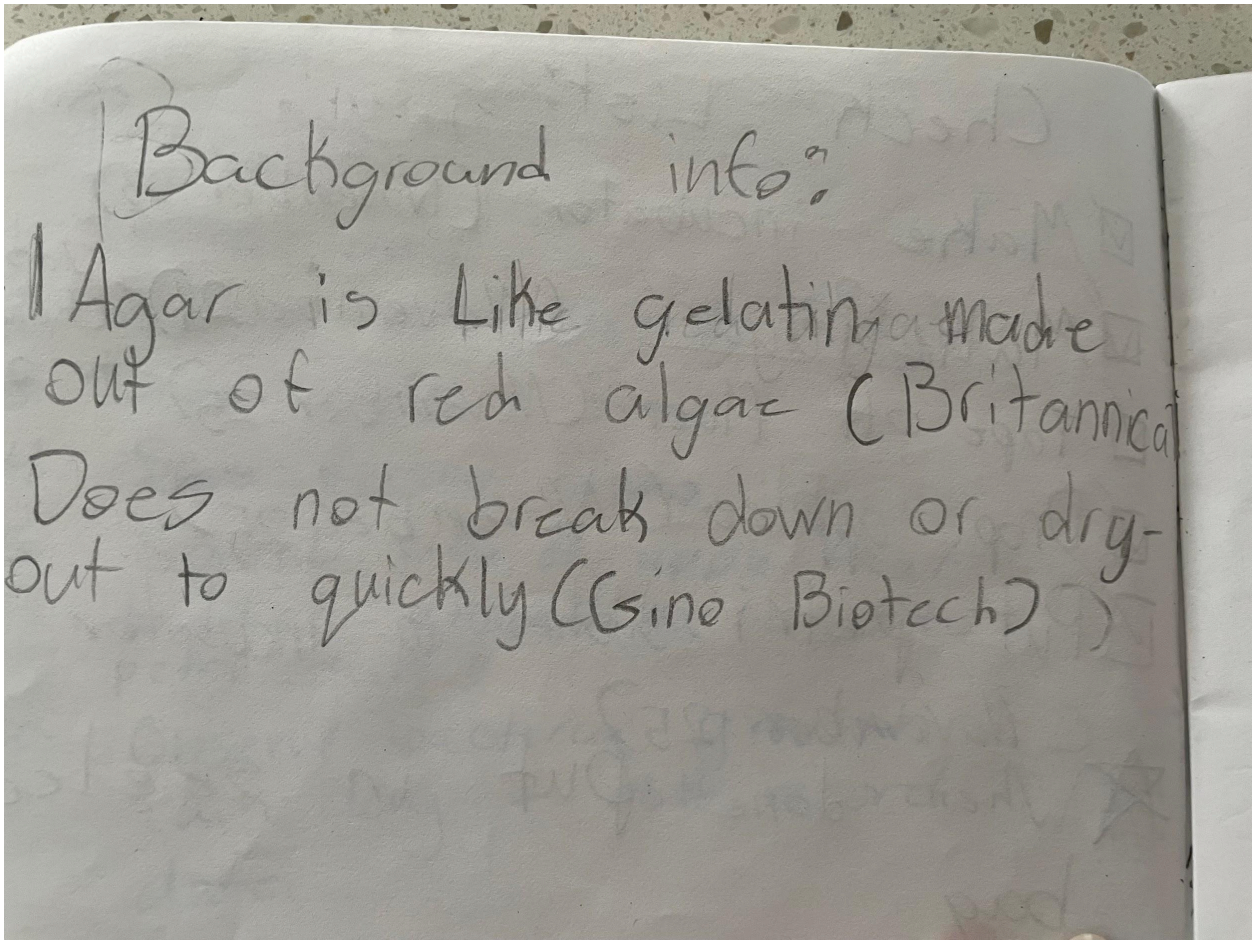
Days	Trial 1 (15 Secs)	Trial 2	Trial 3
1	-No bacteria growth -Condensation on lid (10)	-No growth on the petri dish -Agar has a yellow tint -Condensation (5)	-No bacteria -Condensation (9)
2	-No growth on the dish -Condensation (8)	-No visible growth -Apple strand in agar -Condensation (4)	-No growth -Agar has bubbles in it
3	-No growth visible -Condensation (8)	-No bacteria growth -Condensation on the lid of the dish (4)	-No visible growth -Condesation on the lid (7)
4	-No baterial growth -Condensation (7)	-No bacteria growth -Condensation (3)	-No bacterial growth on dish -Bubbles solidify in the agar
5	-Black spot of bacteria -Condensation on lid (6)	-The bacteria is a faint yellow -Condensation (2)	-No growth -Condensation (6)
6	-Black snowflake looking bacteria -Condensation (6)	-The bacteria is growing in lines -Agar has yellow tint	-Bacteria is a faint yellow -Condesation on the lid (5)
7	-Black vining out bacteria -all the bacteria is growing around black one	-One bacteria is growing on top of one -Condensation is gone	-Bacteria is spread out -Bacteria is circle
8	-Condesation (5) -Black snowflake bacteria -All the bacteria is growing around the black one	-The bacteria is growing in lines -one bacteria is growing on top of another	-Bacteria is growing in spots -Condensation (5) -Faint yellow bacteria
9	-Black vining out bacteria looks like snowflake -Condensation (5) -All the bacteria is growing around the black one	-The Spores are growing by the apple strand -Agar has a yellow tint -Apple strands	-Bacteria is spread out -Condensation (4) -growing in spots -Agar is bubbley

Nov 26

Days	Trial 1 (No time)	Trial 2	Trial 3
1	-Lots of condensation around the edge of the agar (9) -No bacteria growth visible	-No bacteria visible with human eye -Condensation (8)	-No bacteria growth -Agar has chunks in it -Strand of apple -Condensation (6)
2	-No bacteria growth visible -Condensation (9) -Condensation around edge of agar	-No bacteria visible on dish -Condensation on lid (8)	-No bacteria visible on petri dish -Agar has lots of Chuncks -Condensation (5)
3	-No bacteria visible -Condensation (9)	-No bacteria visible on petri dish -Condensation on lid (8)	-No bacteria visible -Agar has chunks -on agar their is a strand of apple
4	-No bacteria visble -Condensation is on lid and on edge of agar (8)	-No bacteria visible -Condensation (6)	-No bacteria growth -Chunks of agar -Strand of apple -Condensation (4)
5	-The bacteria growth is not visible -Condensation (8)	-No bacteria visible -Condensation (6)	-Bacteria is faint yellow and small -Chunks of agar in agar
6	-No bacteria growth visible -Condensation (8)	-No bacteria visible -Condensation on lid (5)	-Bacteria is faint yellow -Strand of apple -Chunks of agar
7	-No bacteria growth visible -Condensation on lid (8)	-Bacteria is faint yellow -Condensation (5)	-Bacteria is faint yellow -Strand of apple
8	-Bacteria is a faint yellow -Condensation (8)	-Bacteria is faint yellow -Bacteria is growing in lines -agar is dryout -Condensation (4)	-Bacteria is faint yellow -3D bacteria -Strand of apple -chunks in agar
9	-bacteria is a faint yellow -Condensation (8) -Condensation on edge	-Bacteria is faint yellow -Bacteria is growing in lines -Drying out -Condensation (3)	-3D bacteria -Bacteria is faint yellow -Strand of apple

Check List:

- ☑ Make incubator (November 23)
- ☑ Make x2 agar (November 24) - Was changed to 25
- ☑ Tape off floor (November 25)
- ☑ Drop apples (November 25)
- ☑ Put petri dishes in incubator (November 25)
- ☆ When done put in sealed bag


Background info:
Agar is like gelatin made out of red algae (Britannica)
Does not break down or dry-out to quickly (Gino Biotech)

Project Question:

How does the amout of time you leave an apple slice on the floor impact the amount of spores of bacteria

Hypothesis

If apple slices are droped on the floor for 0 seconds, 5, 10, 15, and 30 then the apple slice on the floor 30 seconds will have the most bacteria because the bacteria will have more time to spread and grow on thee apple slice

Science Fair Proposal

Student name: Cece D 603

Project Title (be creative) – (Can be added later)

Project Question (What problem are you going to explore?):

Does it matter how long food is on ground for

Hypothesis based on your project question.

Example: **If**...(I do this) ....**then**...(this will result).. ....**because** .....

If I drop an apple slice on the floor for 5 seconds 10 seconds 15 seconds and 30 seconds. Then the 30 seconds would have the most bacteria because it would have more time for the bacteria to be exposed to the apple.

Variables:

Manipulated/Independent variable (what you change):

The amount of time on floor.

Responding/Dependent variable (what you watch for):

The bacteria to grow

* quantitative data
* counting bacteria spores.

Controlled/Constant variables (what stays the same):

floor and size of apple

Required materials:

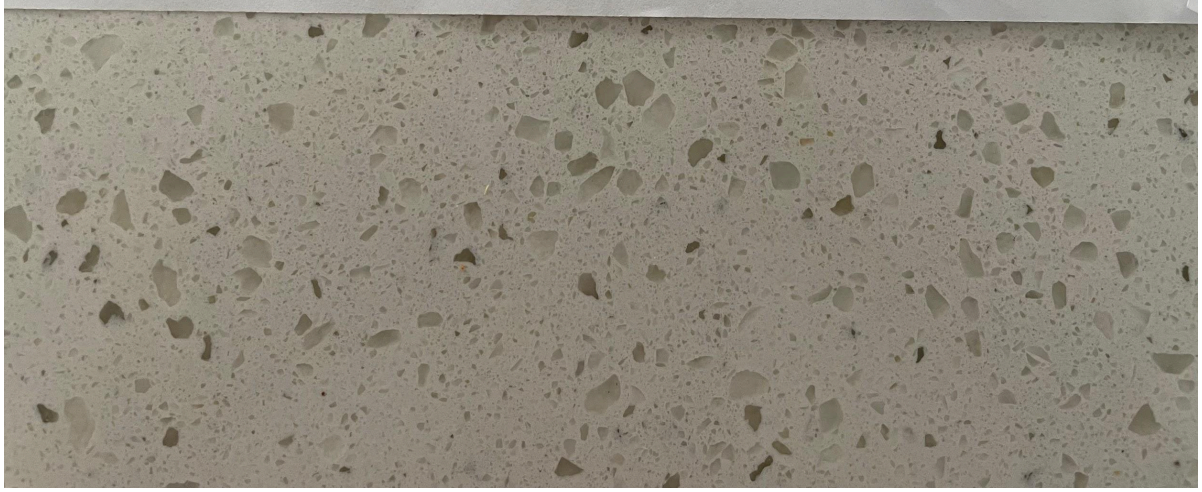
- Apples
- Sterile gloves
- Spot on floor
- Timer
- Petri dish
- Sterile swabs
- Agar
- incubator (heat source)
- camera

Feasibility Check...

- Explain why it is a good testable question.

My Testable Question: How does the amount of time you leave an apple slice on the grownd impact the number of colines (spores) of bacteria amount of?

Why it's a good testable question: it has somthing you can mesure



hypothesis.

Manipulated Variable: Time you leave Apple on the floor

Responding Variable: How many Colines (spores) grow

Control Variables (listed):

- Time on floor
- Time in incubator
-
-
-
-

Hypothesis:

If apple slices are droped on the floor for 0sec (control) 5 seconds 10 sec, 15 sec and 30 sec. Then the apple slice droped on the floor for 30sec will have the most colines (spores) because the bacteria will have more time to spread and grow on the apple.

Quick Checklist

☑ Does your hypothesis follow If... Then... Because...?

Procedure

1. Put on sterile gloves
2. Wash petri dish in soapy water
3. Put a boiling pot of water on the stove
4. Now dunk each petri dish and measuring spoons into the water 5 seconds
5. Then lay out paper towel on a sterilized surface place each dish upside down so the water can drip out
6. With the bigger measuring bowls and the big bowl put them in the microwave for 2-4 minutes
7. In the big bowl put 1 tablespoon and ¾ teaspoons of powder agar
8. Then 1 cup and 4 tablespoon and 1 ½ teaspoons the liquid should be around 303 milliliters
9. Mix solution until the the agar has dissolved
10. Put the mixture into a pressure cooker for 15 minutes
11. Now pour 3 millimeters into the petri dish
12. Make the solution even in the petri dish
13. Let solution cool
14. You can put the petri dish in the figororator or a cold place
15. Tape off spot on the floor
16. Tape it into 12 sections
17. Now cut apples with an apple cutter to ensure equal sizing
18. Drop the first apple on the taped off section 1, leave on floor for 5 seconds
19. Then swab the apple and do a couple strokes with it in the agar petri dish repeat this step with no time 0 seconds, 10, 15, 30 seconds in a different sections do this with an apple that did not touch the floor
20. Repeat this step for two more trials
21. Now put the petri dish in the incubator upside down
22. Put the incubator at 25-27 degrees celsius
23. Leave the peri dishes in the incubator for 5-7 days observer the growth of the bacteria
24. Take photos

Procedure (Incubator)

1. Start off by duct taping the corners and edges of the inside of the cardboard box
2. Now at the bottom by the middle of the cardboard box cut out two tiny flaps that can open and close for the cord
3. Then in the middle of the cardboard box cut out square the sizes of the glass
4. On the inside of the box hot glue the tin foil to the floor and the walls also the flaps
5. Tape the corners again
6. Lastly in one of the corners poke a tiny hole were the thermostat goes

Materials

- Agar powder
- Apple slices
- Apple slicer
- Spot of floor
- Timer
- Petri dish
- Sterile gloves
- Sterile swabs (q tips)
- Camera
- Glass dish
- Tape

Materials For Incubator

- Cardboard box
- Tin Foil
- Lit bulb
- Racks
- Duck tape
- Thermometer
- Glass
- Thermostat

Conclusion

The exsperment shows that 30 seconds will averge out to have the most bacteria. This proves my hypothesis because the hypothesis said that 30 seconds would have the most spores of Bacteria. This proves the background reserch

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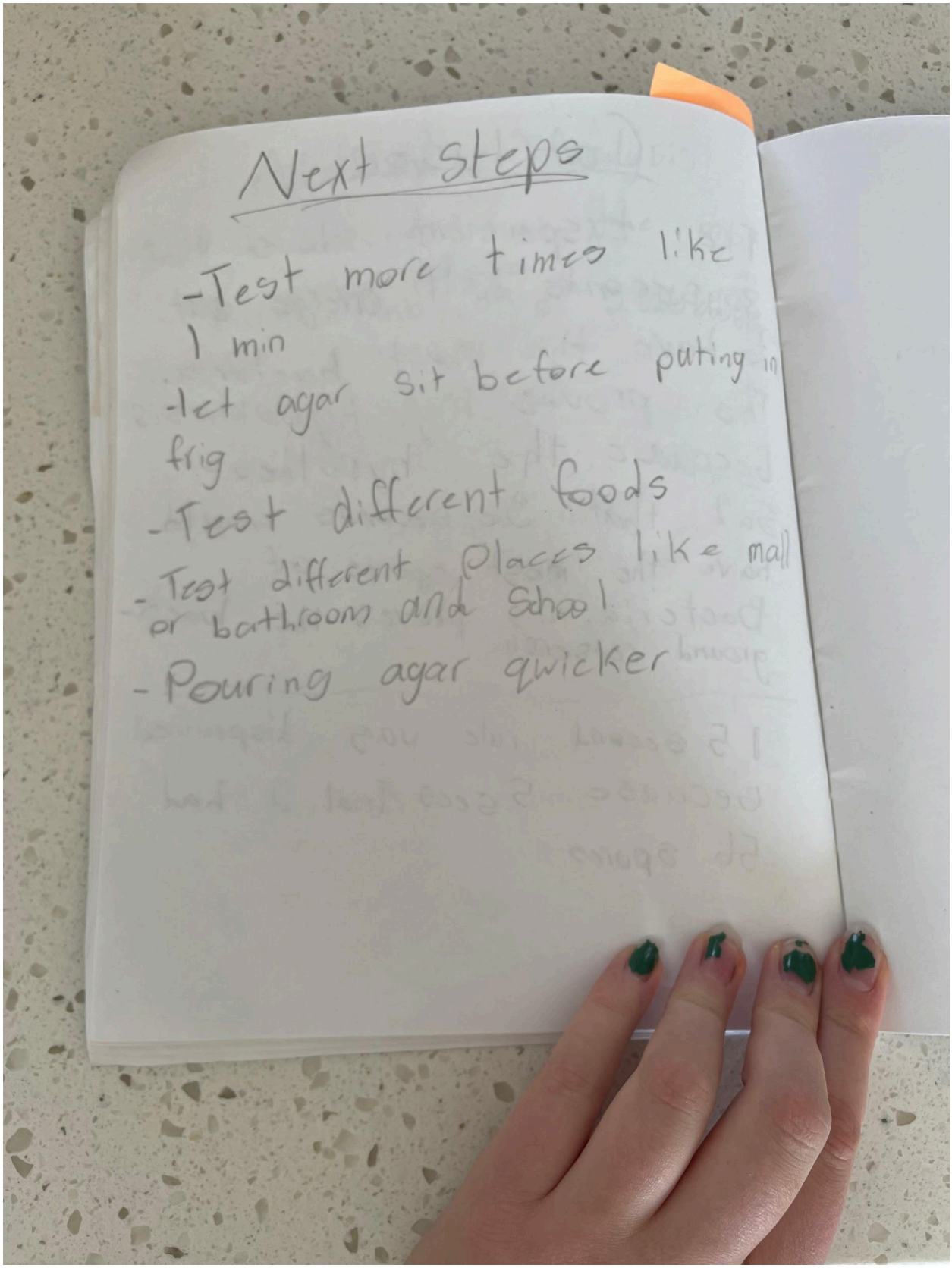
The 5 second rule was disproved because 5 secs Trial 2 had 56 spores


Next steps
-Test more times like 1 min
-let agar sit before puting in frig
-Test different foods
-Test different places like mall or bathroom and School
-Pouring agar qwicker

Variables

Manipulated:

The time the apple slice is on the floor.

Responding:

How many cololines (spores) grow in 5 days.

Controlled:

- Time on floor
- Heat of incubator
- Time in incubator
- Size of apple slice
- Amount of agar
-