



**Prize Winner**

**Scientific Inquiry**

**Year R-2**

**Charlie King**

**Immanuel Primary School**



# HOW CLEAN ARE SURFACES?

## INVESTIGATION:

I wanted to explore how clean or dirty different surfaces are. I decided to try an inquiry using bread to see if different amounts of mould or bacteria grow on the bread after being rubbed on the surfaces i chose. I chose this because i notice that sometimes bread on the bench starts to grow mould over time.

## HYPOTHESIS:

I think that the bread rubbed on the toilet seat will grow the most mould, and the untouched bread will have the least amount grow. I think that a more dirty surface will end up with larger mould growth.

## MATERIALS:

- Bread – fresh loaf of white “wonderwhite” bread
- Snap lock bags sandwich size
- BBQ tongs
- surfaces – unwashed hands, phone, tv remote and toilet seat

## PROCESS:

- I gathered all the materials i needed.
- Using bbq tongs, so the bread wasn't touched, I pulled a slice direct from the loaf and put into first snap lock bag labelled untouched bread. I had help to carefully open the bag so hands didn't enter the inside.
- The next slice was passed around our 5 family members to handle, with nobody washing hands first. This was put into snaplock bag labelled unwashed hands.
- The next slice was rubbed against my mums iphone. This was after a work day, before she cleaned her phone. She works in a hospital and sometimes puts her phone on the workspace. This bag is labelled phone.
- The next slice was put around our family TV remote. This remote hasn't been cleaned for a few days and is touched by our family and sometimes extended family also. This snap lock bag was labelled TV remote.
- The last slice I put against the top side of the main bathroom toilet seat. This snap lock bag was called toilet.
- All snap lock bags were sealed tightly so no air could get inside.
- The snap lock bags were hung on a clothes dryer inside our house.
- I inspected the changes to the bread each day and recorded results.
- At the end of the inquiry, I placed the bread in the bin while inside the snap lock bags.

## RESEARCH:

When I was planning my inquiry, I read some books to learn about bacteria and mould. I used pen and paper to write down interesting facts I learnt. I learnt that bacteria is everywhere around us, and there are lots of different types. I learnt that mould which grows in a container is a type of fungus, and that mould grows from spores floating around the air which grow on damp food. I learnt that mould can be dangerous to breathe in, so we decided to tightly seal the snap lock bags and not open them at the end of the experiment. We threw them straight into the bin. I was expecting to see lots of different colours and shapes and sizes grow on the bread over 2 weeks. Because i was wondering if the bacteria present on surfaces might impact the growth of mould, i chose to use only bread to make the investigation fair. Because bacteria can survive heat and cold, I didn't think temperature would change the investigation. Because of the way bacteria multiplies, i thought that the bread would start with small changes and then bigger growth would happen faster after this.

Bacteria reproduce by splitting apart again and again.  
Some Bacteria makes people sick. Others are extremely useful.  
Bacteria comes in three different shapes.  
rods spirals spheres

they can survive blistering Heat  
freezing cold.

toilet Pohe ram  
We rubbed Bread  
ages. die  
surfaces.  
the surfaces are die.  
I sote the  
toylet wood  
be the  
die.  
some can't move on  
their own at  
all.  
some Protozoa eat other thing. as animals do. this one feeds on blood.  
Bacteria can live almost ANYWHERE.  
Some Bacteria swim  
others wait about using thousands of tiny hairs.  
Hairs help Bacteria stick to surf.  
Hairs  
With wobbly arms.

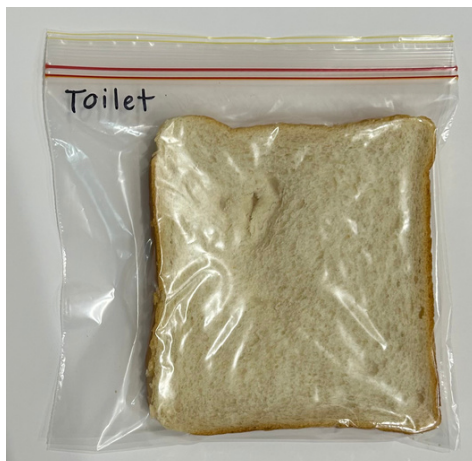
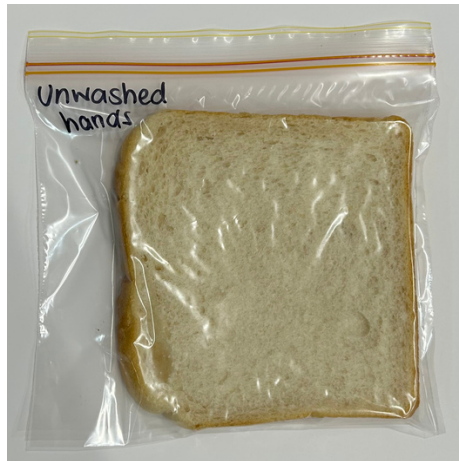
## DAY 1:

To start the experiment, I gathered all the equipment i needed and exposed the bread to the surfaces.

The steps are ser out in the method.

I took photos of the bread slices to compare to.

I hung each bag onto a small clothes air dryer and left it inside our house. athe room gets some indirect light during the day, and is not too close to the heater. Some cool air comes in from the back door.



**Bread at beginning - day 1**



### **DAY 3:**

There has been no changes to the bread. I am surprised, especially on the surfaces i thought would have been more dirty. I moved the bread so that they are hanging in the family lounge room with the warmer air. I am wondering if the warmth will encourage growth. All the slices were moved, so that they are all exposed to the same temperature.

### **DAY 5:**

In the warmer room, I notice some small drops of water inside the bags. The bread slices feel soft and soggy through the bags. The bread slices have not grown anything that I can see yet.



**Day 5 - small drops of water inside bags**

## **DAY 7:**

I am disappointed that the bread has still not changed over the last week. The slices are still soft and there are a few drops of water inside the bags. I have decided not to open the bags to let the water out incase there are mould spores inside which are too small to be able to be seen with human eyes. I am worried that the bread will be too wet and that is impacting the growth. All slices are soft and every bag has some water visible inside, so they are all still equal environments. I decided to move the bread into the original room, away from the warmth and closer to cool air coming from near the back door.

## **DAY 10:**

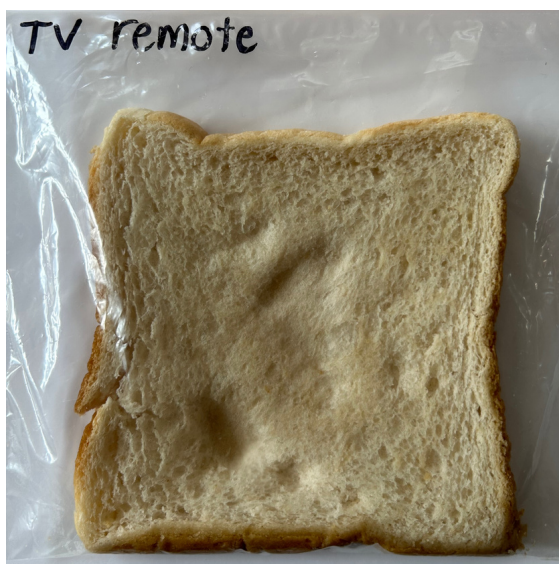
The bread is no longer soft, instead it feels hard to touch. The crusts are still soft. The hard parts have become a darker colour. I don't notice any other changes to the breads. I am thinking that this has not been a successful inquiry, and started to research why this didn't turn out the way i was expecting.

## DAY 14:

I decided to end my inquiry today. I have noticed a very small green patch on the slice labelled 'phone'. The slices are hard to touch, and a darker colour than at the beginning of the investigation.



Bread on day 14





## **DAY 14: PHONE SLICE**

The small green spot noticed on the phone slice. I also notice that there is a dented part of the bread, that has a small film over it. I think that this might continue to grow if there was more time to observe.



**Small green spot noticed on 'phone' slice**



## **EVALUATION:**

I was surprised and disappointed when the bread did not change over the 14 days. My inquiry could be improved by continuing the investigation for a longer period, perhaps there would be growth with more time. I conducted this enquiry over winter, however I predict that summer would work better. I often notice bread grows mould on the bench during the warm summers. I am wondering if light has impacted the experiment, perhaps comparing the growth and changes with a slice of bread in daylight compared to one that is left in a dark box over the same length of time.

I made an effort to not make changes between the slices. My change was that each slice was exposed to a different surface, with potentially more bacteria present. I was careful to make sure other parts were not changed to make my experiment fair. These were the length of time, and the environment the bread slices were kept in. All slices were monitored and compared on the same days as well.

Other inquiry's that i could investigate from this point are whether different types of bread grow mould using the same method. For this inquiry i could use home made bread that is free from preservatives, compared to white supermarket bread (similar to this experiment), wholemeal bread and bakery bread. Other changes could be ingredients that make the breads gluten free or sourdough. I wonder if the white supermarket bread has too many additives and preservatives which stopped the mould from growing. This made me wonder about how these preservatives impact health.

## **CONCLUSION:**

From my investigation, I do not think that the bacteria that lives on different surfaces impacts the mould growth on a slice of bread.

## **ASSISTANCE:**

To research, i used the glossary in some science books to look for facts about bacteria and mould. I had assistance typing my thoughts from my mum.



# OSA RISK ASSESSMENT FORM

for all entries in  Models & Inventions and  Scientific Inquiry

This must be included with your report, log book or entry. One form per entry.

STUDENT(S) NAME: Charlie King ID: 0259-011

SCHOOL: Immanuel Primary School

Activity: Give a brief outline of what you are planning to do.

use bread to explore if a dirty surface grows more mould.

Are there possible risks? Consider the following:

- Chemical risks: Are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal risks: Are you heating things? Could you be burnt?
- Biological risks: Are you working with micro-organisms such as mould and bacteria?
- Sharps risks: Are you cutting things, and is there a risk of injury from sharp objects?
- Electrical risks: Are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation risks: Does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

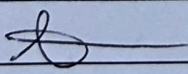
Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control/manage the risk
<u>mould spores</u>	<u>tightly sealed zip lock bags. dispose into bin without opening.</u>

(Attach another sheet if needed.)

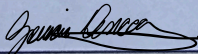
Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Charlie King

SIGNATURE(S):  (parent)

By ticking this box, I/we state that my/our project adheres to the listed criteria for this Category.

TEACHER'S NAME: Gawain Duncan

SIGNATURE:  DATE: 30/6/23