



Highly Commended

Science Investigation

Year R-2

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Where is the Safest Place at School if you Forget your Hat?

By: Manal and Jannah

Part 1. Introduction:

No Hat, No Play, No Fun Today!

Did you know that children's skin is the most sensitive and most likely to get sunburnt?

The teachers at our school say that if you forget your hat during the summer terms that you have to play in the indoor playground only. Some students think that we should be able to go outside as long as we promise to stay under a tree. Some students even think that we are fine and should be allowed to play anywhere we want.

Aim:

We wanted to investigate if the teachers were right or wrong and the if the students were right or wrong.

Question:

Where is the Safest Place at School if you Forget your Hat?

Prediction:

Only the indoor playground will be a safe place for us to play when we forget our hats.

Part 2. **Variables:**

Independent variable (what we are changing)	Dependent variable (what we are testing)
The places in the school we test	The colour change of the UV beads

Controlled variables (what we are keeping the same)	How it is controlled
Which day	All testing was done of the same day
Time of day	All UV level tests were done between 12pm and 2pm
How long we left the beads out for	We watched the beads after 2-minutes each time
The temperature	The temperature was the same each time because all tests were on the same day

Part 3. **Equipment/Materials:**

- 20 UV colour-change beads
- White paper
- Timer
- Clipboard
- Paper
- Pencil
- Camera

Method:

1. Put 20 UV colour-change beads into a light-proof bag
2. Take them out to the place you are going to do the test
3. Quickly tip them onto the white paper
4. Time for 2-minutes
5. Score the colour change out of 5

Colour Change Score	What the beads look like
0	No colour change – still clear
1	Very light colour change
2	Slight colour change
3	Medium colour change
4	Medium dark colour change
5	Dark colour change

Risk Assessment:

Wear a hat when doing the outside UV testing

Part 4. Results:

Location	Indoor, Undercover, Tree-Shaded or Open?	Colour Change Score
Indoor Playground	Indoor	0
Playground	Open	5
Undercover Eating	Undercover	1
Sandpit	Tree-Shaded	3

Photos of the UV colour-changing beads:

The beads changed colour from clear to either yellow, pink, blue or purple.



Indoor Playground – Score 0



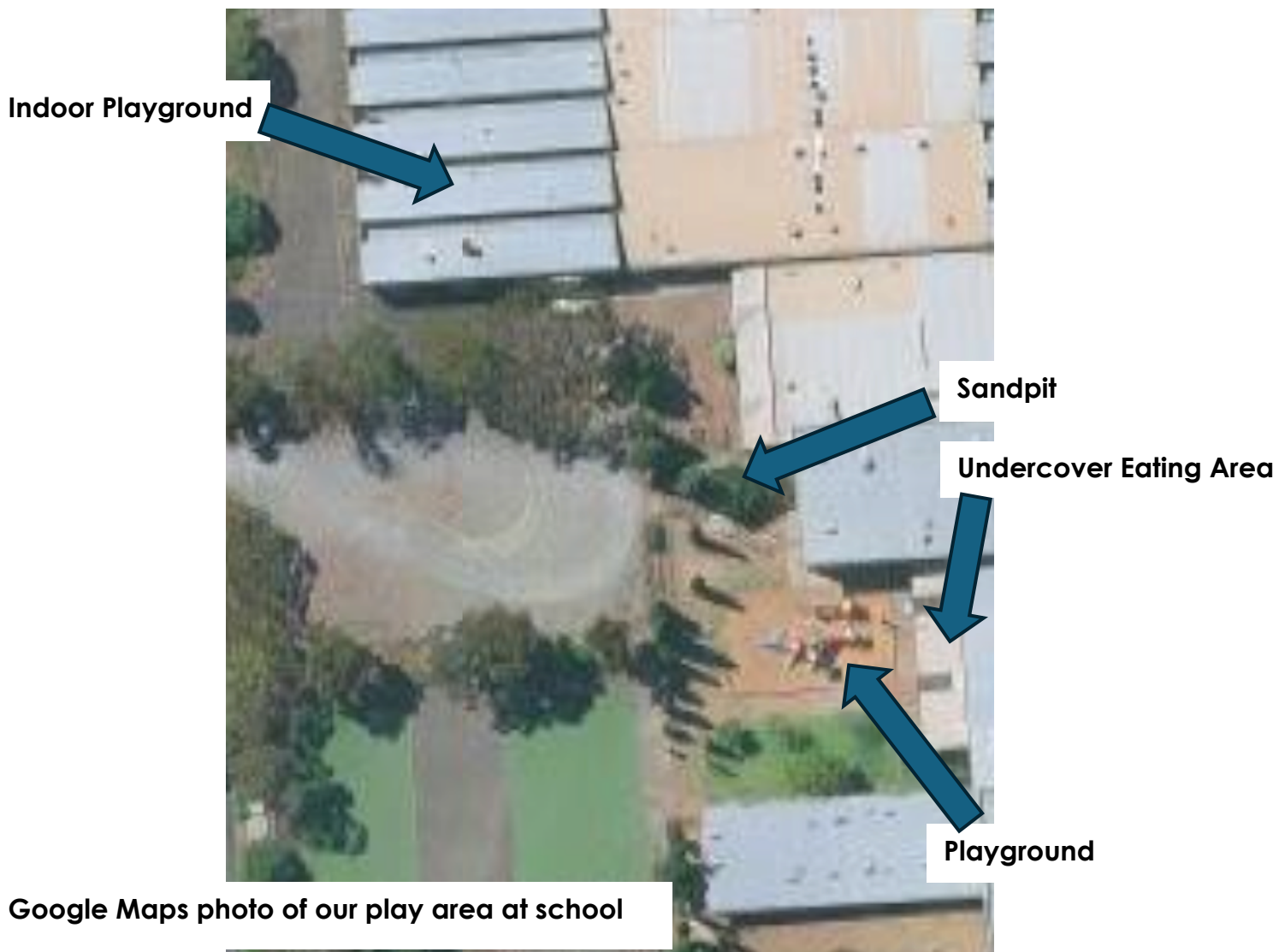
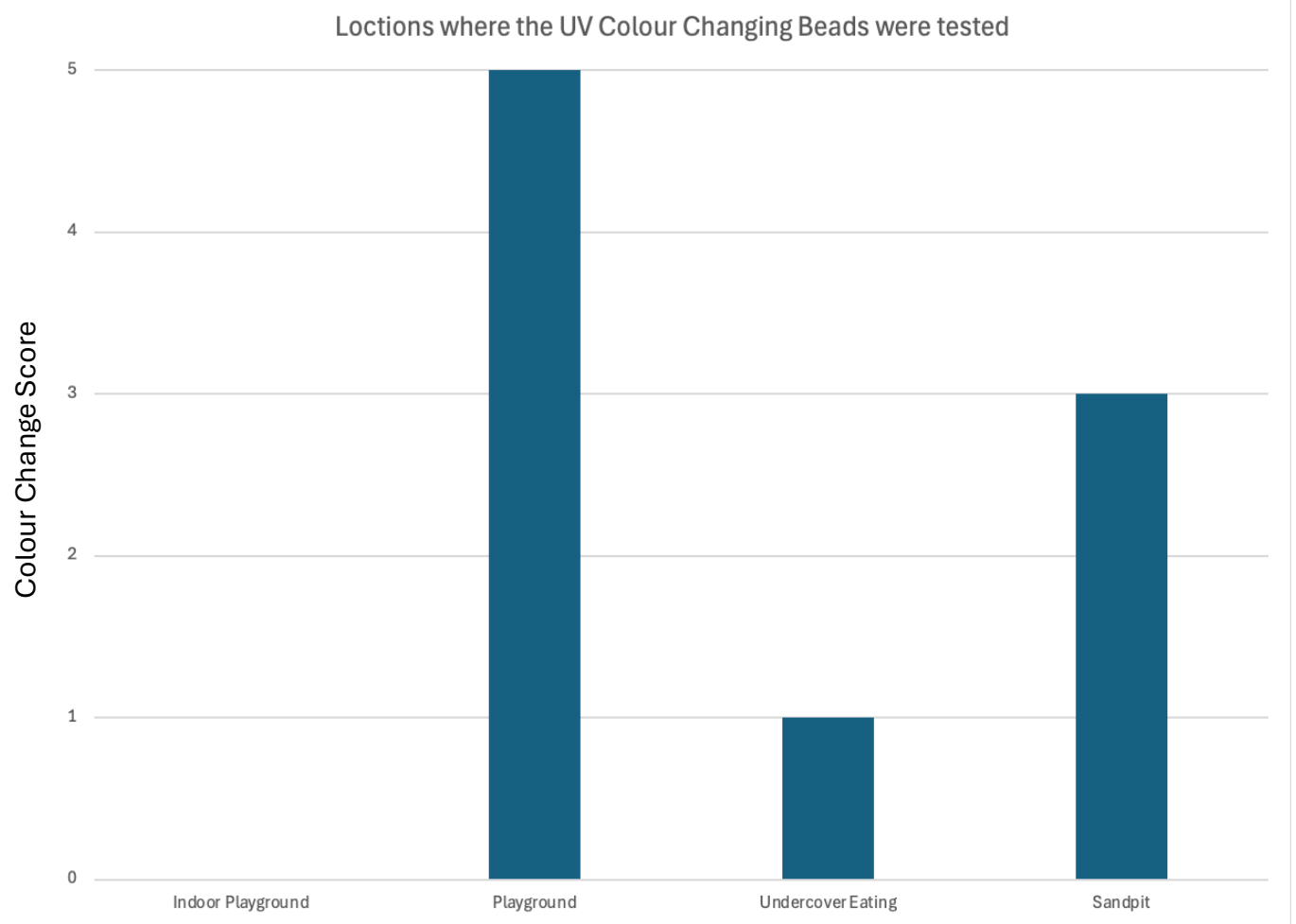
Playground – Score 5



Undercover Eating Area – Score 1



Sandpit – Score 3



Discussion:

CLAIM: The indoor playground is the best place if we forget our hat, but the undercover eating area would work out fine. However, the sandpit and the playground are not safe to play without a hat.

EVIDENCE: The UV colour-changing beads showed that there is 0 UV inside the indoor playground because the beads did not change colour at all. In the undercover eating area, the beads only lightly changed colour. It also showed us that the sandpit and the playground are not safe because of all the UV.

REASONING: The trees over the sandpit are too spaced out and let too much UV get through. But roof over the undercover eating area lets less UV come in. The only place where the UV can't get to is the indoor playground because there's a roof and walls but the undercover eating area doesn't have walls so the UV can come in diagonally just like rain would.

Part 5. **Evaluating:**

Our experiment was important because the students think that it is safe under the trees in the sandpit but we showed that it is not safe. We will present this experiment in assembly at the start of term 4 to let everyone know why it's not safe so they stop trying to play in the sandpit (or anywhere else outside) without their hats on.

The UV colour-change beads are really sensitive and the colour change was quick so it was easy to tell the result. They even worked on a cloudy day. They did get blown away a bit though so next time we could put it in a container instead.

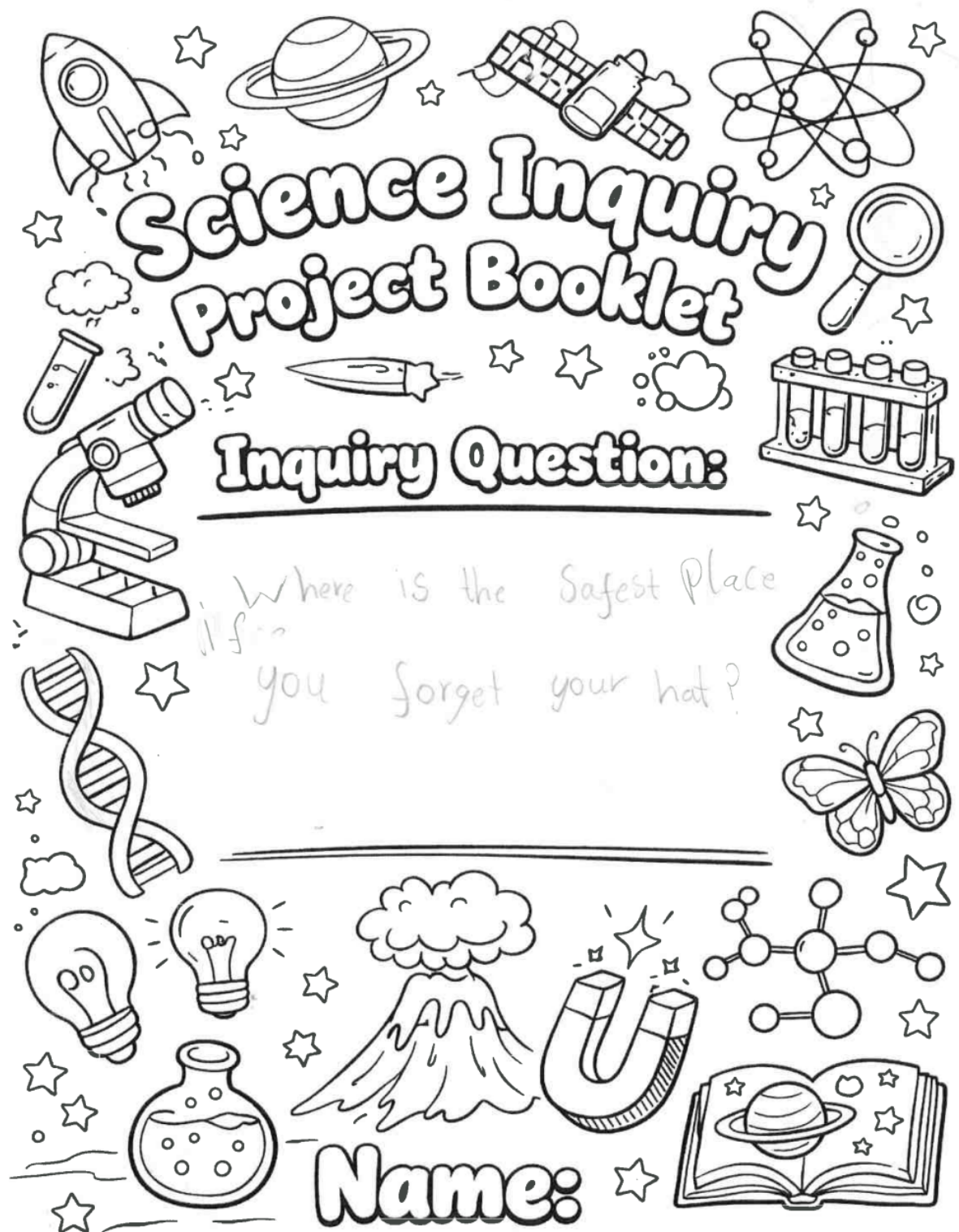
For our next experiment we would like to investigate whether it is safe in our Bush School without our hats because the teachers make us wear hats there even in winter.

Part 6. **References:**

<https://www.sunsmartnsw.com.au/early-childhood/#:~:text=Research%20highlights%20that%20childhood%20is,ensuring%20a%20brighter%2C%20healthier%20future.>

Acknowledgement:

Thank you to Ms Cate for helping us type this.



Manal & Jannah

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Adapted from:

https://primaryconnections.org.uk/site/default/files/2018/09/2018_9.pdf

PrimaryConnections®
Linking science with literacy

Variables grid

Focus question: What things might affect _____?

if we test with some gems there some here in the same time of the day	if we tested on days when the UV was different?	
if we tested at different times of the day	where is the safest place in the school is you forgot your hat?	if we tested on days when the temperature was different
if some are in the corner with no sun	if we tested in different places round the school	

Investigatable question: What happens to _____ when we change _____?

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VARIABLES:

What variable am I changing?

the places around the school

Plan your experiment:

What equipment or materials will I need to conduct my inquiry?

- UV beads

How will I measure my results?

- the colour of the UV beads

What scale will I use to look at my results?

- 0 - no change is white
- 1 - light colour change yellow
- 2 - Medium colour change light pink
- 3 - dark colour change blue
- 4 - really dark colour change purple

CONTROLLED VARIABLES:

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How will I make sure all the other variables stay the same? (look at all the variables on your brainstorm on page 1 and think about how you will keep them all the same)

VARIABLE 1: The UV on different days
HOW WILL I KEEP IT THE SAME? might be different
do all tests in one recess.

VARIABLE 2: The UV at different times
HOW WILL I KEEP IT THE SAME?
do all tests at recess. of the day might be different
the temperature on

VARIABLE 3:

HOW WILL I KEEP IT THE SAME?

do all tests at recess.

VARIABLE 4:

HOW WILL I KEEP IT THE SAME?

VARIABLE 5:

HOW WILL I KEEP IT THE SAME?

Score

Indoor playground ~~20~~ 0 (No colour) 0 0

Undercover eating
playground 20 Light colour 1
20 Dark colour
~~20~~ (Normal colour) 5

Sandpit 20 med ~~20~~ 3
light

OSA RISK ASSESSMENT FORM

for all entries in ☒ Models & Inventions and ☒ Science Investigations

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

STUDENT(S) NAME: Jannah Ma, Manal Bist ID: Shameem

SCHOOL: Iqra College

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

Test UV levels in different parts
of our school

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? **Only batteries can be used for Models & Inventions entries*
- 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
UV from the sun	wear a hat outside if a summer term

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Jannah and Manal

SIGNATURE(S): Manal Jannah

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

TEACHER'S NAME: Cate Hepburn

SIGNATURE: CH DATE: 27/2