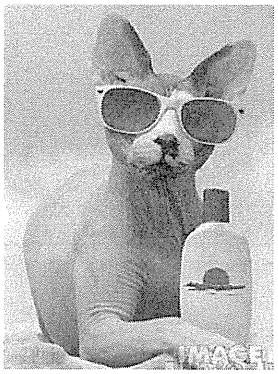
9 SCIENCE PHYSICS UV INVESTIGATION 2016

Name:_____

Form:_____



Teacher: _____

Due date:_____

MARKING KEY

Plagiarism

You must write in your own words, not copy sentences word for word from another student or another source.

Plagiarising = instant zero on assignment and you will have to re-do it.

Assessment policy

Give me a sick note/legitimate reason from parent BEFORE due date = new negotiated due date.

One day late = -20% taken off mark

Two days late = -40% taken off mark

Three days late = mark of zero given

After three days, students are required to attend a detention and are still required to submit the assignment.

Aim: to test the strength of different sunscreens against UV radiation.

If you are not at school the day this assignment is due, please email it to your teacher by the given deadline.

_____@aranmore.wa.edu.au

Your guardian, a teacher or another adult is required to help you proof read this assignment before it is handed in.

Name of guardian/teacher/adult: _____

Signature of guardian/teacher/adult: _____

Date assignment was proof read: _____

Task: design an experiment that allows you to investigate which SPF of sunscreen protects the best against UV radiation.

Available equipment that you can use:

Sunscreen SPF 50+
Sunscreen SPF 30+
Sunscreen SPF 15+
Plastic spoons
UV Detection dial
Wooden pop sticks
Cardboard
Stopwatches

Introduction

There are different subtypes of ultraviolet (UV) radiation; UVA, UVB and UVC radiation.

Identify which ultraviolet radiation subtypes a broad-spectrum sunscreen protects you from. (1 mark)

UVA and UVB (need both for one mark)

Outline what UVA rays can do to the skin. (1 mark)

Prematurely age your skin, causing wrinkles and age spots.

Outline what UVB rays can do to the skin. (1 mark)

Can burn your skin.

In your own words, explain how sunscreen works. (Minimum of two sentences). (2 marks)

Some chemicals in the sunscreen reflect UV rays (1)
Some chemicals in the sunscreen absorb UV radiation so that your skin doesn't (1)

In your own words, state what SPF stands for (it is an abbreviation) and outline what SPF measures. (2 marks)

Sun protection factor (1)

Refers to how well the sunscreen protects against UV B (the type of UV radiation that causes sunburn).

OR.

Refers to roughly how long it will take for a person's skin to turn red. (SPF 15 sunscreen will prevent your skin from getting red for approx. 15 times longer than usual).

Hypothesis: (one sentence prediction including dependent and independent variables which does not use personal language like 'I', 'we') (2 marks)

Example:

It is hypothesised that sunscreen with a SPF of 50+ will protect the most against UV radiation compared to SPF 30+ and SPF 15+ sunscreen.

Independent variable

Dependent variable

Independent variable

Materials: (list all materials used, be specific with number of items used and amounts/sizes) (2 marks)

Sunscreen SPF 50+

Sunscreen SPF 30+

Sunscreen SPF 15+

UV detection dial

Stopwatch

(Any other materials used)

Dependent variable (1 mark)

UV radiation strength

Independent variable (1 mark)

SPF of sunscreen

One controlled variable: (variable kept constant throughout the experiment to keep it fair) (1 mark)

Time UV detection dial was exposed to the sun etc..

Method: (starting from step one, list the steps that were taken) (3 marks)

Results

Table: (show the results taken from experiment, trials and averages, in pencil and using a ruler) (3 marks)

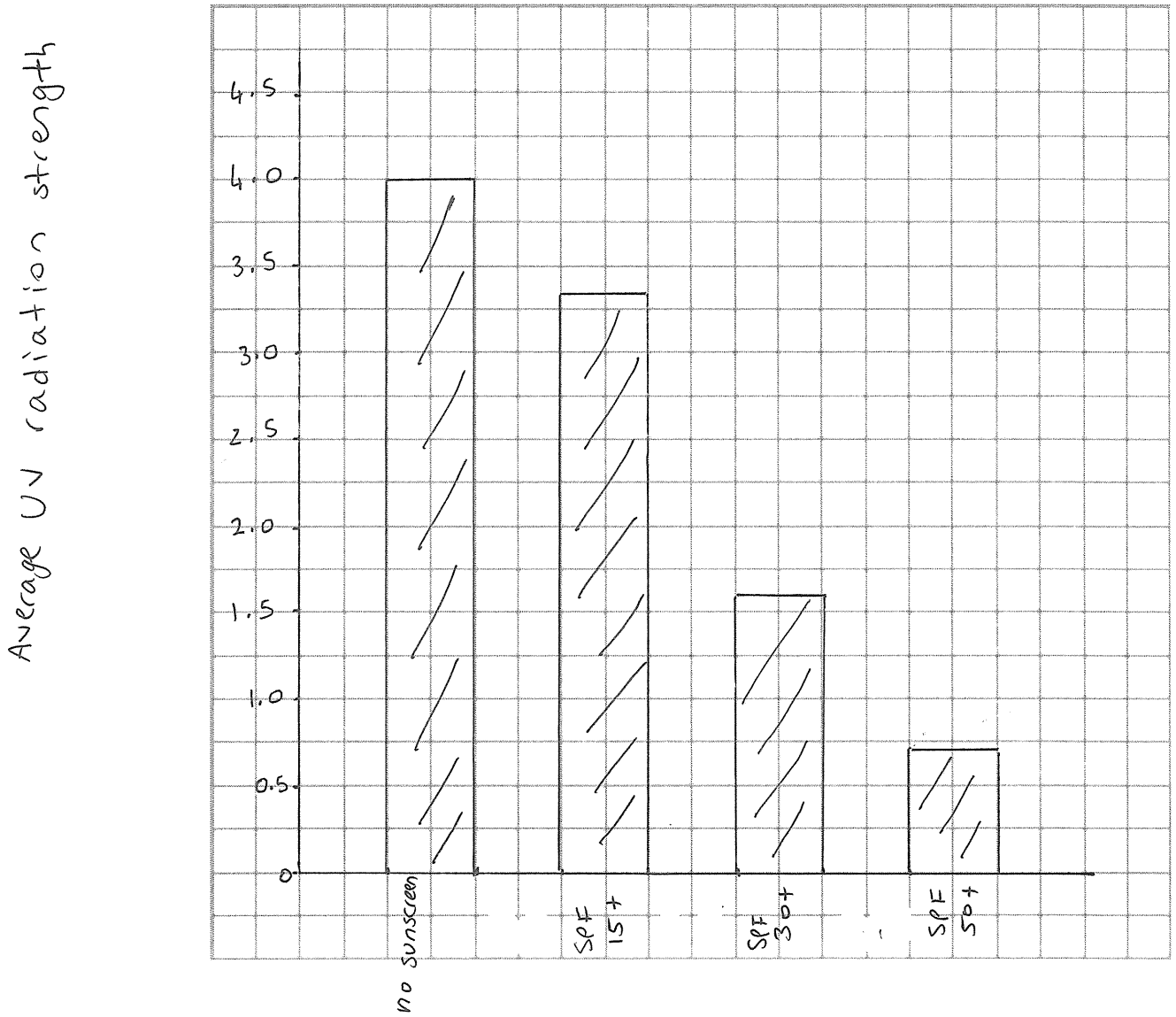
SPF of Sunscreen	UV radiation strength			
	Trial 1	Trial 2	Trial 3	Average
No Sunscreen	4.0	4.0	4.0	4.0
SPF 15+	4.0	3.0	3.0	3.3
SPF 30+	2.0	1.0	2.0	1.7
SPF 50+	1.0	0.0	1.0	0.7

Legend:
very weak: 0
weak: 1
medium: 2
strong: 3
very strong: 4

Graph: (show your group's **average** results in a graph using a sharp lead pencil and ruler) (5 marks)

Is the data you are putting in your graph discrete (each piece of data does not have a relationship with each other, categories being compared are not continuous) or continuous (each piece of data is related to the next)? (1 mark)

UV radiation strength versus SPF of sunscreen



Legend
very weak: 0
weak: 1
medium: 2
strong: 3
very strong 4

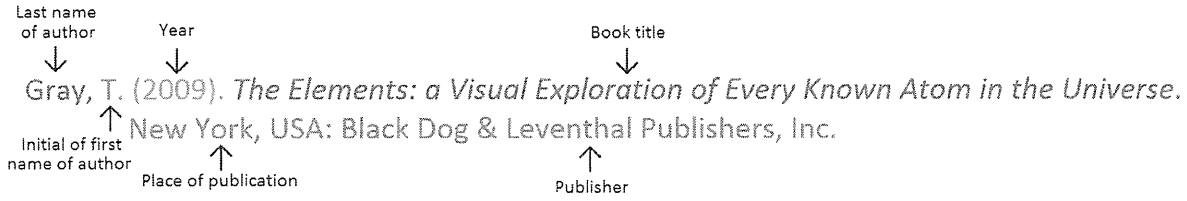
Discussion: (describe one mistake or error that occurred, explain how it affected the results and how it could be avoided next time)
Remember that a mistake can be avoided with care and an error is a small change to measurement that cannot be avoided (parallax error, reading error, instrument error, human reflex etc.) (3 marks)

Conclusion: (state the result of the experiment and state whether the hypothesis was supported or not supported) (2 marks)

Example:
Sunscreen with SPF 50+ had the greatest UV radiation protection compared to SPF 15+ and SPF 30+. (1) Therefore the hypothesis was supported. (1)

APA referencing guide

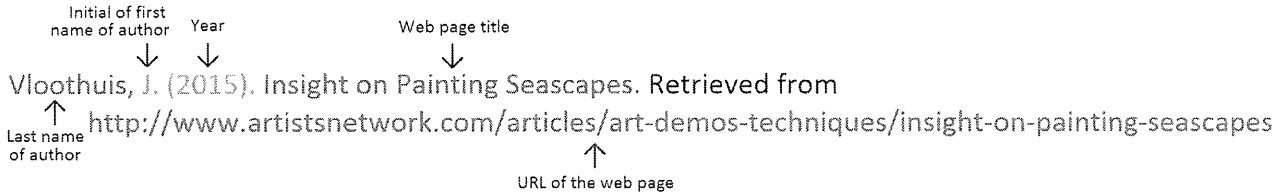
Book



Book with two authors

Shermer, M., & Benjamin, A. (2006). *Secrets of Mental Math: The Mathemagician's Guide to Lightning Calculation and Amazing Mental Math Tricks*. New York, USA: Three Rivers Press.

Website



Website with no author (put title of page at the front)

Aranmore Catholic College. (2014). Retrieved from http://www.aranmore.wa.edu.au/

Website with no date

The Zadkine Museum. (n.d). Retrieved http://www.france.fr/en/museums/zadkine-museum.html

Reference list

Minimum of one reference. (1 mark)

Referenced using the APA referencing style. (1 mark)

_____

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Presented neatly and clearly. (1 mark)

Correct grammar and spelling. (1 mark)

Uses scientific language. (1 mark)

Contributes equally to group experiment. (1 mark)

Total mark: /37 Percentage: %

Teacher's comments: on Seqta