

# Project 4

## The sunshine factor

Analytical chemistry in Ireland  
[rsc.li/3p00Lfl](https://www.rsc.li/3p00Lfl)

# How are sunscreens effective?



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Find teacher support and the full project outline at <https://rsc.li/3p00Lfl>

# Discussion

1. What do sunscreens try to do?
2. What causes the damage?
3. How could we measure the damage?
4. Why is sunscreen important?
5. How could we test their effectiveness?



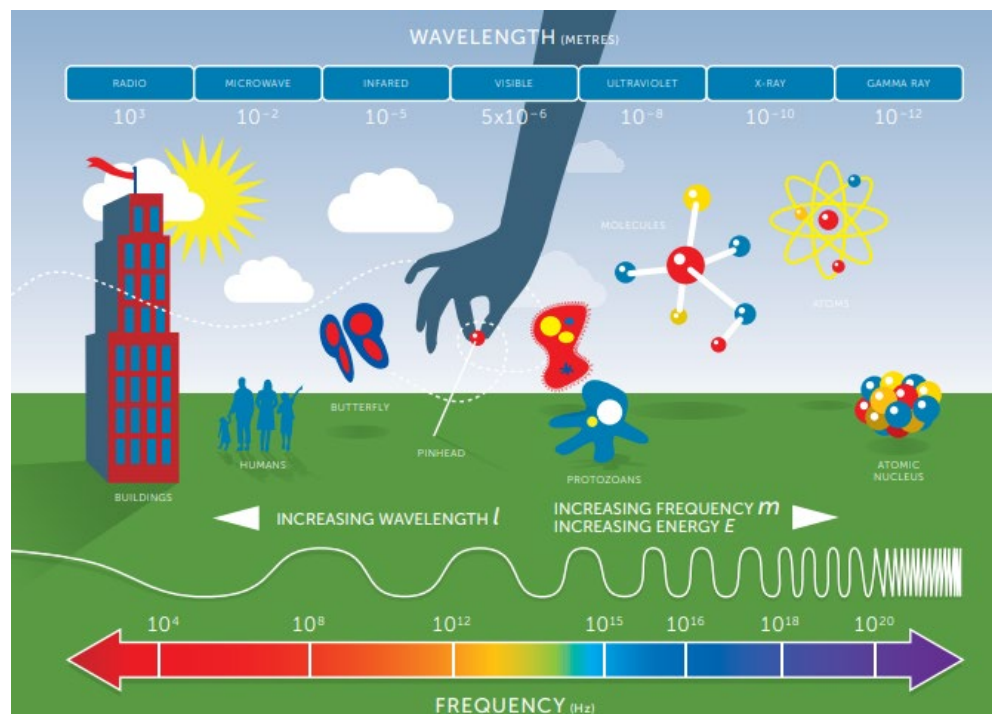
# Wearable battery free device



- This tiny device measures exposure to light across multiple wavelengths, and links with a companion app which allows users to track their exposure to UV rays.
- It's useful for people who are at a high risk to melanoma, newborns and recreational users to warn of the risks of sunburn.

Images from My Skin Track UV, <https://www.laroche-posay.me/en/article/MY-SKIN-TRACK-UV/a37392.aspx> (accessed October 2021) and Wareable, <https://www.wareable.com/health-and-wellbeing/guive-balooch-loreal-myskin-track-uv-uk-launch-7316> (accessed October 2021)

# UV-visible spectroscopy



In analytical chemistry UV-visible spectroscopy is used to determine the concentration of substances, in particular with enzyme kinetics.

Its widest use is as an indicator of tissue damage. Damaged or diseased cells leak enzymes into the blood stream and the concentration of enzymes indicates the extent of the damage.

# Instrumentation in Ireland

**Cathal Connolly** is the associate director of research at Alltech.

He uses quantitative and qualitative analysis to determine the concentration of metabolites in brewing scenarios and enzyme assays.



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Reproduced with permission from Carol Gleeson

**Carol Gleeson** works in the state laboratories providing forensic toxicology services to the Coroners Service of Ireland and the Office of the State Pathologist. She uses her UV-visible spectroscopy skills to help determine or confirm the cause of an unexpected death.

# The scientific method



## The idea

Something you want to investigate, prove or disprove.



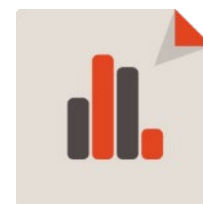
## Planning

Think about how you'll carry it out, what you will use and produce a method.



## Results

Conduct the experiment and collect the results.



## Analysis

Process your results and draw conclusions from them.



## Presentation

Explain what you have found, with a poster, presentation or report.



# Investigating how sunscreens are effective

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# Acknowledgments

This work was produced as part of a community project, with contributions from the Royal Society of Chemistry members and staff, industry partners, Science Foundation Ireland (SFI) and, most importantly, members of the teaching community in Ireland. Thank you to all involved!

To find out more about SFI's Smart Futures and STEM careers resources for students, teachers and parents, please visit [smartfutures.ie](https://smartfutures.ie)

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