

# Illuminate the Science:

Discover Chemiluminescence with HoloLAB VR

**Learning Area(s)**

Science

**Year Level**

Year 10

## Introduction

In this lesson, students will explore chemiluminescence, the emission of light from a chemical reaction without heat, starting with a video of fireflies and glow sticks. They will learn its principles, distinguishing it from bioluminescence, and discuss examples like fireflies, fungi, glow sticks, and forensic uses. Students will use HoloLAB Champions to demonstrate several different chemiluminescent reactions. They will then brainstorm practical applications of chemiluminescence to solve real-world problems.

## Application

### HoloLAB Champions VR

HoloLAB Champions is a VR game that immerses students in a futuristic game show setting to teach and test chemistry lab skills. Students complete realistic lab challenges that emphasise proper techniques, chemical reactions, and measurements. Ideal for classrooms, HoloLAB Champions provides a safe and interactive way for students of all ages to learn and practice chemistry concepts



## Lesson Overview

### Lesson Objectives

- Define chemiluminescence and understand its basic principles.
- Explore examples of chemiluminescence in nature and technology.
- Conduct a simple chemiluminescence experiment using HoloLAB Champions.
- Apply understanding of chemiluminescence

### VR Resources

- [Bioluminescence in 360 VR](#)
- [VR 360 Picture: Bioluminescent Life](#)
- [Glow Worm Caves of New Zealand in 360° | National Geographic](#)

### Apps

- [Tinkercad](#)



to brainstorm and design a practical solution for a real-world problem.

- [CoSpaces](#)

## Lesson Outline



### Before the Immersive Learning Journey

- Teachers should familiarise themselves with the VR experience using [HoloLAB Champions Essentials Guide](#) and ensure that all necessary equipment is set up and functioning properly.
- Students should have a basic understanding of chemistry concepts related to light emission and chemical reactions.
- Students are familiar with Tinkercad and/or CoSpaces.



### During the Immersive Learning Journey

- **IMVR Station:**
  - Students complete the Mini-lab 'Glow, Dye' Glow', where they complete three different glowing solutions using different fluorescent dyes.
  - *Optional:* Students could work in teams to complete the final lab challenge 'Glowing Flask Challenge' (30-40 mins) where they must create a glowing flask by combining substances to complete a chemiluminescent reaction.
- **HHVR Station:**
  - Students watch the videos on bioluminescence (VR Resources) and describe the main differences to chemiluminescence. Furthermore, students can discuss the function/importance of bioluminescence compared with chemiluminescence.
- **Creation Station:**
  - Students are tasked with creating a practical solution to a real-world problem using Chemiluminescence. For example, students could create a device that helps rescue operations locate survivors during night-time searches. Students will use [Tinkercad](#) to design their solutions.
  - If time allows, students could use [CoSpaces](#) to demonstrate the practical application of this design.
- **Research Station:**
  - Students will research and discuss the importance of various real-world applications of chemiluminescence. This could include:
    - Forensic Science: Using luminol to detect blood traces at crime



scenes.

- Medical Diagnostics: Detecting specific biomolecules in biological samples.
- Environmental Monitoring: Detecting pollutants and toxins.



### After the Immersive Learning Journey

Students share their thoughts on the learning experience, noting any challenges they faced and how they overcame them. This may be completed either as a class discussion or in student notebooks or forms (digital or paper).

- How did the VR experience help you to understand chemiluminescence?
- How can chemiluminescence be applied in fields other than rescue operations?
- What are the potential advantages and limitations of using chemiluminescent devices in real-world scenarios?
- Reflect on the design process. What challenges did you encounter, and how did you overcome them?