**Glow Stick Lab**

**Background:**

Quite an amazing reaction is taking place within the glow-stick. When the thin glass vial containing a chemical catalyst was broken, the chemical mixed with the chemical outside the glass vial and the two chemicals reacted together to produce light. Similar reactions occur in glowworms, fireflies and in certain algae. These glow sticks have been advertised to use as fishing lures because fish are attracted to shiny objects.

Fireflies, jellyfish and glow sticks – one flies, one lives deep in the ocean and one provides entertainment in night clubs. What is the link? The answer is some intriguing chemical reactions that produce light.

Chemiluminescence is the production of light from a chemical reaction. Two chemicals react to form an excited (high-energy) intermediate, which breaks down releasing some of its energy as [photons](http://www.scienceinschool.org/2011/issue19/chemiluminescence#photon) of light to reach its ground state.

A + B --> Products + Light

**Chemiluminescence in forensics**

Forensic scientists use the reaction of luminol to detect blood at crime scenes. A mixture of luminol in a dilute solution of hydrogen peroxide is sprayed onto the area where the forensic scientists suspect that there is blood. The iron present in the haem unit of haemoglobin in the blood acts as a [catalyst](http://www.scienceinschool.org/2011/issue19/chemiluminescence#catalyst) in the reaction. The room must be dark and if blood is present, a blue glow, lasting for about 30 seconds, will be observed. The forensic investigators can record this glow by using photographic film, which can be used as evidence in court for the presence of blood at the scene.

Luminol has several important advantages. It reacts with blood without being mixed with any other oxidizing agent. Luminol wears off in 30 seconds, preventing tested substances from glowing for long periods of time. It detects trace amounts of blood that are many years old, even if the bloody surface/item was cleaned. Additionally, any area that is sprayed with Luminol can be photographed to provide permanent evidence of a crime.

Although Luminol is advantageous, it also has several disadvantages. Blood is not the only substance that triggers Luminol. Copper, bleach, horseradish, urine, fecal matter, and animal blood can all distort investigations that involve Luminol because they cause the Luminol to glow everywhere that these substances are located. Also, luminol prevents other tests from being performed on the substance that has been sprayed with it, although DNA can still be safely extracted for further tests.

1. What temperature do you think would be optimal for the fishing lures to work?
2. What does chemiluminescence produce?
3. What is the scientific term for light?
4. Name an advantage of luminol.
5. Name disadvantages of luminol.

**Purpose:**  To design an experiment to find the impact temperature has on reaction rate.

**Hypothesis:** Make a prediction of what you think will happen.

**Procedure:**  Write a complete detailed step-by-step procedure .

**Data:**  Organize your data into a data table.

**Conclusion:**  Explain your results. Please use your data to support your answer.