A Guide to Help You Write Your Science Fair Review of Literature

INTRODUCTION GUIDELINES -

Your introduction is one paragraph and begins your Review of Literature. Follow the guidelines below to help you write your introduction. Your introduction tells what the paper is about and how it has been organized.

DO NOT USE PRONOUNS (I, YOU, WE, MY...).

First sentence: Gets the audience’s attention with a question indicating the purpose.

For example: What is the best outdoor structure material to resist the effects of acid rain?

Second sentence: Retells the title of the project -- usually best if in question form.

For example: Which material should the world use to defend itself from acid rain?

Remaining sentences: (You might have anywhere from 2-6 sentences) Gives a list of the questions or topics researched. The order you put the questions researched in this paragraph should be the order your umbrellas come in the body paragraphs.

For example: In order to find out the answers to these questions, one must explore how acid rain forms and the effect of acid rain. Also, the physical properties of the five structural materials must be researched. These materials include glass, steel, granite, wood, and brick.

3 BODY PARAGRAPHS

BACKGROUND INFO, THREE SCIENTIFIC STUDIES (PURPOSE,PROCEDURE & CONCLUSION) EACH PARAGRAPH SHOULD HAVE A SPECIFIC TOPIC THAT YOU FOCUS ON.

CONCLUSION GUIDELINES -

Your conclusion is one paragraph and is the LAST paragraph of your Review of Literature. It may sound similar to your introduction but effort must be made to word them differently. Again, DO NOT USE PRONOUNS (I, YOU, WE, MY...).
First sentence: Repeats the question that the paper started with to regain the audience’s attention (but worded differently).

For example: Does wood, steel, granite, brick or glass hold up best in acid rain?

Next several sentences: Summarize the main points of the paper that help answer this question. This should be info you have learned from your research.

For example: Acid rain takes out nutrients from leaves when it touches them, therefore weakening the tree where wood for buildings comes from. Acid rain can also damage steel and deteriorate the surface of granite and brick. No damage has been reported on glass.

Next sentence: Cites applications where this information could be used. Why it’s important.

For example: These findings could help architects and builders choose quality materials that will withstand the pressures of acid rain in the future.

Last sentence: Give one or two places the reader could find more information on the topic. This could come from your reference list. You should list the title and author or website. Titles of books need to be underlined.

For example: For more information on acid rain and its effect read this web page by John Gordon, Mark Nilles and LeRoy Schroder http://bqs.usgs.gov/precip/reports/arfs.htm.

Example

Luminol (C₈H₇O₃N₃) is a chemical substance used by crime investigators to detect the presence of blood in a crime scene. When luminol is sprayed on a surface area, etc., if iron is present, a blue glow will began to light up. The chemical reaction in which the glow is emitted is not caused by the blood being there; it’s caused by the iron inside the blood. This reaction is known as a chemiluminescence, the emission of light as a result of a chemical reaction without an apparent change in temperature ("Chemiluminescence," 2003).

Luminol chemiluminescence is where the chemicals in the luminol solution react with the hemoglobin which are oxygen carrying protein in blood (Harris, 2002), and form new molecules. In this reaction the original molecules have more energy than the molecules formed. That extra energy that the
molecules have is then gotten rid of, which is how the glow is formed when using luminol. Other than luminol things that use chemiluminescence are fire flies and the glow sticks that you crack to start a temporary glow.

The chemical reaction chemiluminescence is found in side glow sticks. Inside the sticks before its glowing there is a vial inside it holding chemicals. Those chemicals will react with the chemicals outside the vial to form the glow. The molecules being formed by the two chemicals have a low energy level while others have a high energy level. Because of the unbalance in the energy level, that extra energy is being released in the form of photons or the temporary glow/light (Lew, 2008). The color of the glow is formed by dyes also inside the tube.

Fire flies also use the chemical reaction chemiluminescence to give off their bright green glow at night. The male fire flies are the ones that glow at night. They give off the glow to attract their mates. In the reaction a luciferin substance substrate and the enzyme luciferase reacts with oxygen, to form adenosine triphosphate (ATP) as the energy source that creates the glow (Stedman, 2004).

Luminol is also used for other things besides being used in crime scenes. It has been found that luminol can be used to help improve the conditions of hospitals and control infections. Dutch researchers carried on an experiment to detect traces of blood in their hemodialysis units, where hepatitis C virus is frequently transmitted (Anonymous, 2008). When performing experiment they found many traces of blood on surfaces such as telephones, control panels, and the floor.

An essay on DNA Fingerprinting and the many things that a person’s DNA holds can do to person was written by David E. Newton. In this essay he took on and researched a case on a man Kirk Bloodsworth who was convicted for rape and murder as his scenario. In the essay, he explains how DNA from blood, can put a person at a crime scene and the many ways someone’s DNA can be detected, one way using luminal chemiluminescence. When researching and testing, Newton found that the intensity of the glow of luminol shows how much DNA was present on the nylon strip (Newton, 2007), or in other words the more DNA the brighter the glow of luminol when sprayed on a surface. In the conclusions of
Newton’s essay he question the accuracy of DNA technologies that continue to trouble research scientist, law enforcement officials, and concerned citizens (Newton, 2007).

Scientist Jean Vienneau from New York College at Fredonia, studied Luminal Chemiluminescence, and wrote her thesis on her studies from obtaining her master’s degree. In her studies the purpose was to seeing how the environment and luminol played together. She focused on the pH levels of the environment more than anything. She found that chemiluminescence intensity and total chemiluminescence emission (solution phase) appear equally sensitive to pH environment (Vienneau, 1994). Her results showed that a change occurs in the relationship with pH and follows the manner that catalyst efficiency varies with pH (Vienneau, 1994). In her thesis’s conclusions she also stated that more research and work needs to be required to find out how the environment plays with the intensity of the chemiluminescence (Vienneau, 1994) of luminol.

In conclusion, research shows that luminol can be affected by environmental factors. There are some factors that can hurt its final product or improve it. Other research shows that there needs to be more research to even say what environments affects chemiluminescence in one way or another. Luminol is used around the world for many different reasons, and it’s important to society and to us.