

# Physics in Action

Materials: None\*

Time Allotment: ~3 week

Due Date: April 2<sup>nd</sup> 2014

## Overview:

This “lab” involves the conducting of an Internet search and the completion of a writing assignment which demonstrates your understanding of the application of the principles of Physics.

## The Assignment - Internet Search:

In this assignment, you will conduct an Internet search in order to gather and make meaning of the physics of **one** of the topics listed below. You must have at least three Internet sources with the title of the site and the URL for each source. Furthermore, you will have to retrieve at least one graphic image which meaningfully depicts some physics. (Wikipedia is not counted as an Internet resource.) Guiding questions for each topic are provided; do not feel limited by these questions but definitely give attention to them. Upon making meaning of the topic, you will summarize your findings in the form of a short writing exercise. Directions and guidelines for the writing portion of the assignment are provided below. The chosen topics involve topics for which there is an abundance of available scientific information that is both understandable and interesting for high school students. Eligible topics for your Internet search include the following:

- **String Theory**

Discuss the history of the founding of string theory. Your paper should include the general concept of string theory as described to an average well educated individual. The concepts in general need to be addressed, including the scientists that are currently working on the theory. Retractors of the theory are certainly relevant.

- **Quantum Theory**

Describe the theory in laymen terms. What does the theory really tell us about the world we live in? Are there any practical applications to Quantum Theory? Discuss which scientists are proponents of the theory and what are the recent discoveries in the field?

- **Relativity**

Discuss Einstein’s theory of relativity. When did he first devise the theory and how did the state of world affairs influence him. How has this theory affected science for the past century? Has the theory withstood the test of time in the science community?

It is suggested that you pick a topic that is of natural interest to you and spend your time enjoying the Internet search (rather than merely getting it over with it). To begin your search, it is recommended that you use an Internet search engine, such as Google, msn and yahoo. Use some strategic search terms in order to gather an index of reasonable sites which pertain to your topic. As you conduct your search, devote your time to looking for scientific information. If you happen to find links to such places as The Franklin Institute Science Museum, physics classroom or Bill Beaty's Science Site, be sure to follow the links. These are excellent and understandable sites with a wealth of scientific information on the topics listed above.

## The Assignment - Written Summary:

Once you have conducted a suitable search of your topic, write an organized summary of your findings in your own words. The summary should be word processed and at least two pages long and not more than four pages long. The summary should also include the following features:

- The topic should be discussed in a manner that communicates it clearly to an individual who has little or no prior understanding of the topic. Consequently, any use of sophisticated terms is first defined and explained without the assumption that the reader is familiar with such terms.
- A clear connection should be made between the topic being discussed and principles discussed during class. It should be obvious to the reader that you understand how physics is applied to the real world phenomenon which you have chosen to research.
- The actual sources which you used (title and URL) must be listed within the written summary or on a separate page of paper.
- The graphic image which you acquired from the Internet should be neatly attached to a clean sheet of paper and include a short caption written in your own words which meaningfully explains what is depicted in the picture.

## Assessment:

Your writing assignment will be assessed using the following scoring rubric.

<b>1. Internet Search</b>  Demonstrated an ability to conduct an extensive Internet search for information relevant to a given topic; was able to make judgments about the scientific validity of the info and to finally incorporate the info into a written summary.	<b>0 - 1</b>  Failed to use or to list three Internet sources or the information which was retrieved does not suitably address the topic.	<b>2 - 3</b>  Used and listed three Internet sources to retrieve and incorporate information into a written summary; search seems limited by the lack of quantity, meaningfulness, or quality of info.	<b>4-5</b>  Used and clearly listed three Internet sources to retrieve an abundance of accurate and meaningful information and clearly incorporated the information into the written summary.
<b>2. Physics Understanding</b>  Demonstrated a clear understanding and application of physics principles by exhaustively explaining the physics of the topic; included and meaningfully described a graphic image acquired from the Internet.	<b>0 - 1</b>  Discussions and explanations are brief and hasty; may have failed to include a graphic image; effectiveness of writing may be hindered by many serious errors; understanding of topic is not fully developed.	<b>2 - 3</b>  Discussions and explanations are superficial; attention not given to specifics of the physics; too vague; written summary may be inaccurate or lack organization and clarity; includes some few detrimental errors	<b>4-5</b>  Discussion and explanations involve depth and specifics; included an accurate writing was clear and organized; included a graphic image and a clear discussion of what it depicts; demonstrated a perfect understanding and application of physics