

Earth Savior (to make an automated machine to make recycled paper)

Comments:

This group has pointed out a “need” and an “ideal” solution. However, these are probably well thought of by many people previously. The innovation should be on “how” to achieve this task. The consideration should be the cost (both dollar cost and environmental cost). One should avoid solving one problem by creating another. To gain support from the end users, the final machine should be environmental friendly (in term of energy consumed, pollution produced, etc) and cost effective (whether it is affordable to most offices).

Amazing Marble (to make marbles that will dissolve quickly in children’s throat)

Comments

This is more a material science question than a biological question. The group is looking for a kind of eatable material that can rapidly change state (from durable and moisture resistant solid state to dissolved liquid state) under a change in environmental conditions (from playground/table/floor to children’s throat. Finding/producing such a material is the key.

Edible Liquid Soap

Comments

This group proposed to invent a new type of child-safe liquid soap, probably by using some “natural” additives for smell, taste, etc. This group needs to clarify the objective. Are they going to make a “safer” soap or to make a “tastier” soap? To make something safer, the best way is to eliminate toxic components rather than adding new ingredients. If the main purpose of the product is for “cleaning” but not for “eating”, the cleaning effectiveness should still be the main concern. Also, this group should distinguish between “soap” and “detergent”. The word “soap” carries a chemical meaning.

Green Forest Shampoo (to make new shampoo using natural substances)

Comments

This group proposed to use “natural” substances such as leaves of the Morning Glory to make shampoo. The first consideration is the cleaning power. Is it better than/comparable to the current products on market? It is wrong to assume that “natural” substances are “safe”. There are many “natural toxins”. Also, something that is safe in low dose may be harmful after concentration. When calculating the cost of production, it cannot be assumed that the raw materials are free to collect from the environment. To the best of our efforts, we “should not” unlimitedly harvest species in the wild. Otherwise, we may cause extinction of the species. A better way is to cultivate a particular species in a farm. The research/development/production costs of such a cultivation farm should be taken into consideration.

A Survey of Pupil’s Health in Kei Ling (a survey on quality of sleep)

Comments

This group may need to define the quality of sleep (what is good and what is bad). There are similar surveys done previously. Sample questionnaires may be available. Nonetheless, this group should first state clearly what biological question is being addressed and what the hypothesis of their research is.

Bad Bag (a survey on school bag on market)

Comments

This group should distinguish the research from survey done by the Consumer Council. One way to achieve this is to propose an ideal/improved prototype of school bag after the survey. In this case, the project should belong to type A. To make the whole investigation more scientific, this group can consider building model for human bones and muscles. Knowledge from physical principles such as forces, torsion, CG, etc. can then be applied.

An Investigation on Beauty Efficiency in Aloe Vera

Comments

There have been many researches done on the protective effects of Aloe. This group should search to find out if their idea is new and innovative. They should have a clear goal to test for, e.g. testing the effect of Aloe application on the moisture retention ability on skin. At the initial stage, it is difficult (and sometimes not suitable) to use human as a testing object. This group may consider using a simple, available, and reproducible testing model, e.g. pig skin.

The Secret Behind the Fresh Milk Mixed with Ginger Juice

Comment

This group should define their objective clearly. Are they going to investigate the conditions (including materials used and physical parameters such as temperature) that lead to the formation of the semi-solid state? Will the underlying scientific principles be studied? (Or if they would like to improve the taste of this food product?) The proper methodology to be employed will depend on the objective set forth.

Rapid Identification of GM Food on Market

Comment

A good source of information on GM food can be found at www.isaaa.org. Currently, there are two major strategies to check for GM components in food: (1) PCR to detect the introduced DNA; and (2) antibodies to detect novel proteins. Both are very costly. If this group would like to propose a new/rapid/cheap method for GM food detection, they should come up with a variable idea for testing

Bacteria Counts in Beverages

Comments

This group would like to survey the bacteria counts on different types of beverages. Again, it looks like a survey of the Customer Council or Department of Food, Environment, and Health. The best way for bacteria count in this kind of survey is by cultivation of bacteria and colony count. However, growth of bacteria is kind of dangerous and may be prohibited in high school. An alternative way is to perform total bacteria count under a microscope. To remove impurities and color, filter apparatus and activated charcoal may be useful. However, since the number of bacteria count may be low, some kind of concentration process may be necessary. Nonetheless, the major concern of this project is that a central hypothesis of research seems to be missing.

The Secret of Iron, Tea and Tannic Acid

Comments

The interaction between tannic acid and iron has been studied previous. This group should search for related information to prevent duplication of previous works. For this kind of research, the methodology will determine the reliability of the data. For examples, how to assay the reaction between tannic acid and iron? How to control the continuous production of tannic acids in tea (or even tea leaves)? What kinds of tea to be compared? How to reduce the interference by the natural pigments in tea? On the top of all these technical concerns, the most important question is “what hypothesis is being tested?”

Healthy Fiber from Edible Mushroom

Comments

This group proposed to study the effects of healthy fibers from edible mushrooms that can help to reduce the risk of cancer in the digestive system. There are two main types of food fiber: soluble and insoluble fiber. Insoluble fiber serves to induce peristalsis that may help to reduce the risk of colon cancer. However, new data suggest that soluble fibers also have some anticancer properties. Many researches have been done on the issue of dietary fibers and their anticancer roles. There are some established ways to measure food fiber contents. Some can be done in high school and some

cannot. This group should study the results and approaches of related researches to prevent duplication of efforts.

See It, Or Not? (an investigation of the deception of senses)

Comments

This group proposed to investigate the deception of senses (sight, smell, sound, taste, etc.) The idea sounds interesting but the scope may be too wide. For a scientific research, the depth is a major concern. One cannot satisfy on knowing something has happened. We should know why and how something has happened. After setting up the methodology and performing some pilot tests, this group may consider focus on one or two most promising topics and perform in depth studies.