

Name _____

Date _____ Hour _____

Independent Investigation

The Background Research



IMPORTANT NOTE:

A good background research piece reads like an informative essay. It must flow well and create an informative link between the independent and dependent variable. Your background research must include at least three sources in order to get a well-rounded informative and useful piece.

- I. Introduce Category:
 - a. Choose the category that best describes your independent investigation.
 - b. Introduce the scientific question and the category it falls under.

Category	✓	Category	✓
Animal Sciences		Energy: Physical	
Behavioral and Social Sciences		Engineering Mechanics	
Biochemistry		Environmental Engineering	
Biomedical & Health Sciences		Materials Science	
Cellular & Molecular Biology		Mathematics	
Chemistry		Microbiology	
Computational Biology & Bioinformatics		Physics & Astronomy	
Earth & Environmental Sciences		Plant Sciences	
Embedded Systems		Robotics & Intelligent Machines	
Energy: Chemical		Systems & Software	

Example: The scientific category that the experiment best represents is Plant Science because it concerns the study of plants and ecology.

The scientific category that the experiment best represents is _____ because it concerns the study of _____

II. Explain Research

- a. On the table, list at least 3-5 authentic sources (book, magazine, newspaper, webpage, etc) written in MLA Format and include a significant passage/ excerpt that would best be used to support the understanding of your experiment. The excerpt can be quantitative or qualitative data that helps create thorough background information of the experiment.
- b. Introduce the research summaries found in each source.
- c. Explain how each summary helps you understand the scientific question.

Bibliography & Supportive Passage		
#	MLA Formatted Resource	Supportive Passage
1	"Beans." <i>How to Plant, Grow, and Harvest Beans of All Kinds: Organic Gardening</i> . Organic Gardening, n.d. Web. 20 Jan. 2014. < http://www.organicgardening.com/learn-and-grow/beans?page=0,2 >.	Most beans grow best in air temperatures of 70° to 80°F, and soil temperature should be at least 60°F.
2	Hannink, Nerissa. "Salt of the Earth- How Do Plants Cope?" <i>How Plants Cope with Salinity</i> . SEB, July 2005. Web. 20 Jan. 2014. < http://www.sebiology.org/publications/Bulletin/July05/salinity.html >.	Once inside the cell, salt can cause ionic stresses, largely as Na ⁺ (and Cl ⁻) inhibit metabolic processes including protein synthesis. "Na ⁺ can rise to toxic levels in older leaves, causing them to die. This reduces the leaf area available for photosynthesis and so the plant cannot sustain growth or crop yield " says DrMunns. So, as our population grows (estimated to increase by 50% from 6.1 billion in 2001 to 9.3 billion in 2050 ³), salinity is shrinking the land available for growing our crops at an alarming rate.
3		
4		
5		

*Example: It is important to note that bean plants are relatively easy to grow and one of the few conditions that cause stress to its growing environment is cold soil. According to the authors from the **Organic Gardening Webpage**, cold soil can cause the beans to rot at temperatures lower than 60 degrees Fahrenheit. Further data suggests that some harsh conditions that can stress all plants, not just bean plants, are excessive salt (Hannink,1).*

It is important to note that _____

_____.

According to _____ (mention the authors and source), _____

_____.

Further data suggests _____

_____ (_____ Authors last name, _____ page # information is found on).

NOTE:Explanation of research should not be limited to the passages provided above. It requires a comprehensive understanding of your question. Make sure to include ALL data necessary for extensive comprehension of your research.

III. Vocabulary Integration

- a. On the table, list the vocabulary words that are necessary to understand significant aspects of the experiment and include their definitions. Choose words used in your category.
- b. Include vocabulary significant to understanding the ins and outs of the experiment, while stating the definition to help familiarize the audience with the details.
- c. Explain how the vocabulary is important in the experiment.

Vocabulary Term	Definition
Salinity	of, containing, or resembling common table salt; salty or salt-like: a saline solution.
Photosynthesis	the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.

Example: Salinity is a saline solution that contains sodium chloride and distilled water. It is important to the experiment because too much salinity in the soil of any plant shrinks the available water, thus shrinking the size of the leaf. When the size of the leaf shrinks, it impedes on its ability to grow. Photosynthesis is the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct. It is necessary to understand this process because it has a parallel affect to the amount of salinity in the soil. When salinity increases, leaf size decreases, leaving very little photosynthesis to occur, thus inhibiting the ability of the plant to grow.

_____ (vocabulary term) is _____

_____ (definition of term).

It is important to the experiment because _____

_____.

_____ (vocabulary term) is _____

_____ (definition of term).

It is necessary to understand this because _____

_____.

_____ (vocabulary term) is _____

_____ (definition of term).

It is necessary to understand this because _____

_____.

IV. Formulas, Diagrams, and/or Tables

- a. Include any formulas or diagrams used to help understand the experiment more thoroughly. Make sure to label every figure or table and provide a caption. Only include visuals that will help you explain your research.
- b. Refer to diagram when explaining research so as to further the readers understanding.

Example:

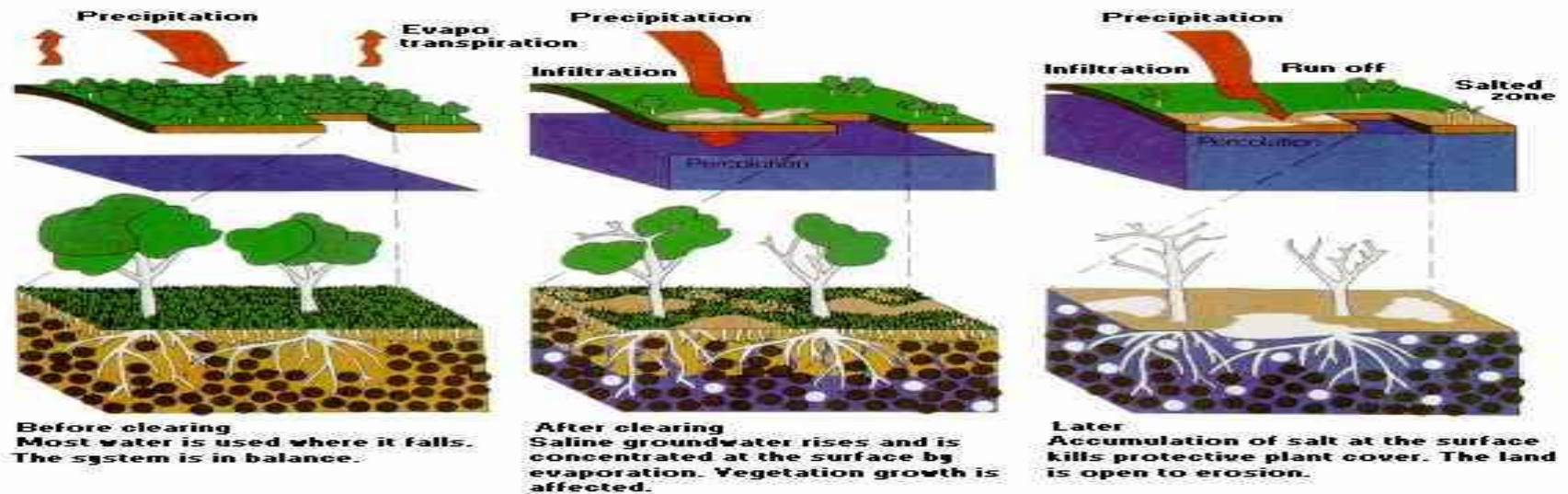


Figure 1: A slide by slide description of the effect of increased salinity in the soil.

In figure 1, there is a direct relationship between the amount of salinity in the ground and the health of the plant.

(Include diagram) In _____ (refer to either your figure or table) _____ (refer to the figure or table number), _____
