

Operation Egg Drop

Name: _____

Date: _____

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Introduction:

The citizens of Australia are starving and in desperate need of protein rich food due to the recent wide spread flooding combined with the devastation caused by Cyclone Yasi. As part of a Global Rescue program our job as WCR students is to help feed the displaced families and insure they do not suffer from and develop **Pellagra**. They currently are surviving off donated molasses and corn meal and are in desperate need of protein rich foods. Our mission is to deliver a large quantity EGGS to the region as soon as possible. We can only distribute the eggs by low flying aircraft because they will rot if we take them by boat. We only have room in the plane for packages that are **SHOE BOX** size or **SMALLER**. It is very important that when the eggs are dropped they do not break on impact. We will test all of the packages, with egg inside, from the roof of WCR to insure they will survive the delivery from an aircraft.

Requirements:

1. You must use or build a package that does not exceed the dimensions of a common shoe box a **(15.5" long x 7" wide x 4.5" tall)** or **SMALLER** that will safely deliver an egg when your package is dropped to insure the egg **DOES NOT** break.
2. The egg cannot be hardboiled.
3. The egg **MUST** be in a zip-lock bag inside your package.
4. You may use/make a parachute as long as it can be retained inside the box with the lid closed does not exceed the size limitations of the box.
5. You can insulate the egg as long as it does not exceed the size limitations of the box
6. You can use any materials you want to protect your egg.
7. If you work with a partner/s **everyone** will be required to complete and turn-in each written section of this project

The purpose of this project is to demonstrate that you know how to apply the scientific method in your final report!

Research: Pellagra

Pellagra is a vitamin deficiency disease most commonly caused by a chronic lack of niacin (vitamin B₃) in the diet.

Pellagra can be common in people who obtain most of their food energy from maize (often called "corn"), notably rural South America where maize is a staple food. Maize is a poor source of tryptophan as well as niacin if it is not nixtamalized. Nixtamalization of the corn corrects the niacin deficiency, and is a common practice in Native American cultures that grow corn. Following the corn cycle, the symptoms usually appear during spring, increase in the summer due to greater sun exposure, and return the following spring. Indeed, pellagra was once endemic in the poorer states of the U.S. South, like Mississippi and Alabama, as well as among the inmates of jails and orphanages as studied by Dr. Joseph Goldberger.

Pellagra is common in Africa, Indonesia, and China. It was common amongst prisoners of Soviet labor camps and the Gulag. **In addition, pellagra is a micro-nutrient deficiency disease that frequently affects populations of refugees and other displaced people due to their unique, long-term residential circumstances and dependence on food aid.** Refugees typically rely on limited sources of niacin provided to them, such as groundnuts; the instability in the nutritional content and distribution of food aid can be the cause of pellagra in displaced populations.

Women suffer the most cases because they would give protein quality foods to their children first. Women also would eat after everyone else had a chance to eat. Women also upheld the triad of corn, molasses and fat back pork which combine to contribute to cause pellagra.

