**Scientific Method Case Studies**

**#1 Oil Spill Case Study**

In 2010, an explosion on an oil rig caused a terrible oil spill in the Gulf of Mexico. As oil started washing up on shore, the area wildlife was drastically affected. A scientist wonders how do different amounts of water pollution affect the height of radish plants? He thinks that the plants with the most pollution will not grow as tall. He plants ten seeds in dirt in separate cups and gives them water every day. He has mixed the water with different amounts of motor oil (as pollution). He gives each tree a different level of pollution. He continues this for several weeks, and measures the height of each plant and finds that the more pollution the less the plant grew.

**#2 Plant Hormones Case Study**

A student wondered how hormones affected plant growth and wanted to test the hypothesis that rooting hormones will stimulate the production of new roots at a faster rate than would take place without rooting hormones. Two stem cuttings of equal length were taken from a geranium plant. The cut end of one plant was dipped into the hormone and then planted in wet sand. The other cutting was planted in wet sand without dipping it into the hormone. Both cuttings were given water and sunlight. After 4 weeks, both cuttings were removed from the sand and the lengths of the roots that had developed were measured and found to be the same.

**The Strange Case of BeriBeri**

In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was Beriberi. Symptoms of the disease included weakness and loss of appetite, victims often died of heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with beriberi. The injected chickens became sick. However, so did a group of chickens that were not injected with bacteria.

One of the scientists, Dr. Eijkman, noticed something. Before the experiment, all the chickens had eaten wholegrain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case and found that polished rice lacked thiamine, a vitamin necessary for good health.

**How Penicillin was Discovered**

In 1928, Sir Alexander Fleming was studying Staphylococcus bacteria growing in culture dishes. He noticed that a mold called Penicillium was also growing in some of the dishes. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, no clear areas were present. Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth. Fleming then added the nutrient broth in which the mold had grown to a culture of bacteria. He observed that the bacteria died which was later used to develop antibiotics used to treat a variety of diseases.