

## JUNIOR GRADES 7-8

### 250 WORDS PROJECT SUMMARY

#### EARTH AND ENVIRONMENTAL CATEGORY

#### ***Vegetation Sanitation: Measuring the Impact of Oil Spills on Oxygen Productions of Aquatic Plants***

The purpose of the experiment was to evaluate how oil spills effect photosynthesis in aquatic plants by measuring production of oxygen. The hypotheses were that if an aquatic plant is coated with oil, it will produce the least amount of oxygen, compared to oil being poured over the water surface. The secondary hypothesis was that the prototype developed in last year's project, "The Super Filter," would remove the majority of the oil in the simulation, and the plant would produce more oxygen.

First, the production of oxygen from the aquatic plant was tested in its control setting. Then, the plant was dipped in oil, to simulate shallow water spills. Next, the oil was poured over top of the plant in its water, to simulate a deeper water spill. Then, the "Super Filter" prototype was used to remove as much oil as possible from the deep-water simulation. Finally, the plants' oxygen production under each of these experimental conditions were compared.

The study demonstrated that each type of oil spill caused the aquatic plant to produce less oxygen. The hypothesis was correct, dipping the plant in oil caused the biggest reduction in the amount of oxygen made. Finally, the "Super Filter" cleaned up the oil spill and improved the oxygen production of the plant; however the oxygen production was still at its greatest quantity

with the control. The results showed that no matter the size, type, depth or clean-up method of an oil spill, it is still incredibly harmful to aquatic life.

## EARTH AND ENVIRONMENTAL CATEGORY

### ***Maximizing Woodstove Heat***

In our country, lots of people live in a rural environment. Of those people many (including my family) heat their homes with wood. So, to minimize impact on the environment it is important to know how moisture and wood type affect heat production.

In my experiment I tested different wood types and moistures to see how they burned.

Hopefully, this will enable wood-burners to know what woods to burn and whether it's worth it to season wood. This will allow them to get maximum heat output from their wood.

To start my experiment, I first measured the volume of the wood. Then I cut the wood in half and took a reading with a moisture meter from the center. Third, I put the wood in the woodstove and measured heat from two places every ten minutes.

The results of the experiment were unexpected, however, as they showed dry maple produced more heat than wet maple, indeed much more than everything else, but wet ash produced 0.03 degrees Celsius per cubic centimeter more heat than dry ash. Most surprisingly, wet birch produced an average heat that was a whopping 0.48 degrees per cubic centimeter warmer than dry birch. Perhaps seasoning wood has a greater effect on harder woods than on softer woods. So, if you were to burn any piece of wood, it would ideally be dry maple. Further

research is needed to confirm these results. I would test more species of wood and more samples of each type.

## EARTH AND ENVIRONMENTAL CATEGORY

### ***An Unbe-leaf-able Science Project***

Our project studies the effects on the growth of a milkweed plant. We chose this because we thought it would be interesting to grow plants and even more interesting to test liquids other than water on them. Our hypothesis is that denser liquids will cause the plant to grow slower due to less light entering between the particles.

To start, we planted 9 seeds, 3 pots for each liquid, in a portable greenhouse. We watered each set of pots with the same amount of different liquids: water, orange juice, and chicken broth. The plants were watered from some point between 5:00 PM and 8:00 PM each Saturday starting just over a month before the fair.

We tried to do our best to research when and how to water a milkweed plant, but either the times we watered at a time, or the liquids themselves caused mold to grow. The mold spread for a while but eventually was joined by moss in the chicken broth pots. So far, no plants have broken the surface of the soil. Overall, it would have been better to further research how to water our specific plant since even the plants watered with regular water haven't begun to grow. We did, however, learn that orange juice is the poorest as it has grown the most mold.

## HEALTH AND LIFE SCIENCES CATEGORY

### ***Which forms of exercise will produce a target heart rate?***

My partner and I picked this topic because we both enjoy playing sports and being active in our daily lives. We want to explore more about how to optimize our exercise for better fitness. When exercising, it is important to exercise at the right level of effort (intensity). The recommended heart rate while working out is called the target heart rate or THR. Your THR is 55-90% of your max heart rate (or HRmax). To calculate your HRmax you do  $208 - (0.7 \times \text{your age (years)})$ . My partner and I are seeking to find out which exercise is best for reaching our personal target heart rates. We will be experimenting with the following forms of experience: walking, jogging, weights, burpees, and skipping rope. To be testing this, we will each first calculate our target heart rate. We will do one exercise per day at the same time each day. We will track our heart rate using a heart monitor. We will exercise for 20 minutes and track our heart rates at 0 minutes, 5 minutes, 10 minutes, 15 minutes and 20 minutes. Our hypothesis is that burpees will be the highest heart rate of them all and jogging will be closest to our THR.