**Watt is the deal with megawatts?**

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| **Overview:** | Utilizing skills performing Mathematical operations with decimals, students will work in groups to solve a real life problem. |
| **Keywords:** | Lucky Peak, hydroelectricity, dams, power, Math, 6th grade |
| **Subject:** | Math |
| **Age / Grade Range:** | 6th grade |
| **Background:** | Lucky Peak Dam was built by the Army Corps of Engineers on the Boise River about 5 miles north of Boise. The dam and reservoir are used for recreation, irrigation water for farmers and the generation of power. The dam generates around 101 megawatts of energy each day. 1000 kilowatts = 1 megawatt. Every few years, the Army Corps lets off the excess water which creates a beautiful “rooster tail.” |
| **Common Core and Idaho Content Standards:** | Standard 6.NS.B3- Fluently add, subtract, multiply and divide using decimals to solve real world problems.  Standards for Mathematical Practice-1. Make sense of problems and persevere in solving them. 2. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 6. Attend to precision. |
| **Goals:** | Students will connect Math to the real world. |
| **Objectives:** | * Students will be able to perform mathematical operations using decimals. * Students will answer the question: How is hydroelectricity measured? |
| **Materials:** | Chart paper, markers, YouTube video |
| **Set up:** | You will need to cue the video found on YouTube at: <http://nww.usace.army.mil/html/OFFICES/PA/NR/NR12_files/12-35RoosterTail.PDF> |
| **Time/ Duration:** | This lesson should take approximately 90 minutes. |
| **Introduction (Engage):** | Ask students if any of them have been to Lucky Peak Beach. Ask if anyone has seen the rooster tail that is released from the dam. Explain the background information and tell the students they will be watching a video about the dam.  Review with students how to divide, subtract, add and multiply decimals. Once the quick review is over, give the students the following problem:  *At Lucky Peak Dam, 3 turbines are used to generate electricity. 2 of them can generate* *45.8 megawatts (MW) of electricity per day and the other generates 11.6 megawatts (MW) per day. How many megawatts do all the turbines generate each day? Each week? Each year?*  *Lucky Peak Dam generates extra electricity which is sold to Seattle. 70% of the power generated each day is sold to the City of Seattle. How many megawatts are sold to Seattle? How many megawatts are left for the City of Boise?* |
| **Activity (Explore):** | Break the students into groups of three and explain that they are going to be creating a poster to present to the class regarding their findings. Their poster should show their answers to each question. Groups should also show their work in a neat and orderly fashion. Make sure that each group chooses a spokesperson who will explain the work to the entire class.  As you walk around the room, look for students who are solving the problem in various ways. You can look for standard algorithms, ratio tables etc. Pick a variety of strategies. It is also okay if a group does not have the correct answer, this gives all the students a chance to critique each other’s work. The groups that you have chosen now come up and explain their work. The other students are checking for understanding by asking questions of the groups presenting. If they have trouble getting started: Ask someone else to explain a groups math to the class. |
| **Explanation:** |  |
| **Elaboration:** | As students are explaining their strategies keep track of them. After the groups have presented, review each one with the entire class. Ask which ones make more sense to them, which are more efficient, did all the strategies get us the correct answer? |
| **Evaluation/ Assessment:** | As you are walking around assess how deeply the students understand decimals. |

**Additional resources:** Where can the teacher go to learn more? List web sites or books that might be useful.

**Family/ Community Connections:** Families can make the trip up to Lucky Peak and explore the dam, the park or the beach.