Paddy's Pool Problem

An Irish rogue named Paddy Proportionovich had recently left Ireland in search of gold to fill his pot of gold. Paddy heard of a lost pool in the Amazon Jungle containing gold flakes and decided to go in search of it. After several months in the heat of a summer storm, he stumbled out of the jungle with proportional samples of the pool in hand. All of a sudden, the storm started raging and a lightning bolt struck Paddy. He then died.

Under undisclosed circumstances, a chemical engineering company obtained the samples that Paddy had brought out of the jungle and a map that he had drawn. Satellite surveys have confirmed that there is a cylindrical pool with a layer of sediment in it on top of a volcano exactly where Paddy’s map indicated. The satellite survey further determined that the pool’s dimensions were 0.109 miles in diameter and had a total, uniform depth of 353 centimeters which included the layer of sediment. Based on Paddy’s *perfectly* proportional samples, the company had determined there is 0.11 g of gold per 1.0 gram of dry sediment. Because of this, they have estimated that they will need to spend 10 billion dollars to recover the gold from the remote pool on top of the volcano.

**Question/Purpose:** How much gold does your sample contain? Is there enough gold in the pool to make the $10 billion investment to retrieve it worthwhile?

**Assignment:**

Before the Lab:

* Write a detailed procedure that would test the question
* Write a materials list for what you will need to use in lab
* Create a system to collect your data

After the Lab:

* Show all calculations performed during your experiment
* Formulate a conclusion that restates your purpose and procedures, analyzes your results (including possible errors), and makes a final conclusion for the future of Paddy’s Pool

**Rubric for Grading:**

\_\_\_\_ *5 pts* **Materials List**

\_\_\_\_ *10 pts* **Procedure**

Procedure is appropriate to solve lab objective *(2 pt)*

Complete with all necessary steps *(4 pt)*

Clear explanations, referencing all materials *(2 pt)*

Third Person *(2 pt)*

\_\_\_\_ *10 pts* **Observations and Data**

\_\_\_\_ *10 pts* **Calculations**

Approach to calculations uses dimensional analysis (2 pt)

Shows unit conversions *(4 pt)*

Gives source for any data obtained from outside sources *(2 pt)*

All calculations include proper number of significant figures and units *(2 pt)*

\_\_\_\_ *15 pts***Conclusion Statement**

Should the company mine Paddy’s Pool? Why or why not?

Answer is in complete sentences and uses evidence to support the claim.

Your Final Score: \_\_\_\_\_\_\_\_/ 50 points

**Staple this sheet to your final lab report. Your lab report will be due: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**