How Many Jelly Bellies?

You will be given a small bag of jelly bellies. Your job will be to determine the number of jelly bellies in the bag without counting them. This activity will give you practice in creating observation charts, clearly showing calculations and using significant digit rules.

Instructions:

1) Remove 10 jelly bellies from your bag. Determine the mass of the 10 JBs and record in the chart below. Answer questions #1.
2) Calculate the average mass of 1 JB. Answer question #2 and 3.
3) Zero the balance with an empty bag and then measure the mass of the full bag of JBs and record in chart below.
4) Using the average mass of 1 JB and the total mass of all of the JBs, calculate how many JB are in the bag. Answer question #4.
5) Physically count the number of JBs in the bag. Be sure to do this with clean hands on a piece of paper toweling if you plan to eat the JBs later. Record your number below.
6) Calculate your percent error by following the formula given below.
7) Answer questions #5 and 6.

Observations: (Be sure to include units.)

Mass of 10 JBs: _____

Mass of bag of JBs: _____

Counted number of JBs: _____

Calculations: (Be sure to **show your work** and give your answer to the **correct number of significant digits**.)

1) Average mass of 1 JB:

2) Number of JBs in the bag:

3) % error = $\frac{\text{Counted \#JBs – calculated \#JBs}}{\text{Counted \# JBs}} \times 100\%$

Questions:

1) **How many significant digits have you recorded for the mass of the 10 JBs?**
2) **How many significant digits should your answer to the average mass of 1 JB include?**
3) **Why is it better to calculate the average mass of 1 JB rather than just find the mass of 1 JB?**
4) **How many significant digits should your answer to the number of JBs include?**
5) **Based on your percent error, do you think that calculating the number of JBs is a valid method to determine the number of JBs in the bag?**
6) **What might account for your calculated answer not being exactly the same as the counted number?**