Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Accuracy and Precision in the Food Industry**

**Objective:** Students will analyze lunch-sized bags of chips to determine the accuracy andprecision of the food industry.

**Procedure:**

– In this lab, define accuracy as the net weight  0.10 grams

– Define precision as having a variance  0.20 grams

– All measurements need to be to two decimal places and must include units

– Each student in the group should have the same type of chip and same size bag to proceed

***Step 1:*** Label your bag of chips with numbers before you start to weigh them.

***Step 2:*** Weigh each unopened bag individually. This is the gross weight.

***Step 3:*** Open each bag and dump the contents onto a paper towel. Weigh each emptybag individually. This is the tare weight. You may eat the contents.

***Step 4:*** Calculate the net weight for each bag by subtracting the tare weight from thegross weight.

***Step 5:*** Determine if each bag's content is accurate. Prove your answer on the nextpage.

***Step 6:*** Determine if all of the bags together are precise. Prove your answer on the nextpage.

***Step 7:*** What inferences can be made about the manufacturer and the accuracy of theirproducts’ weight?

**Data Table:**

Type of Chips: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The NET WEIGHT (in grams) printed on the bag of chips: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Bag #** |  |  | **Gross Weight** |  |  | **Tare Weight** |  |  | **Net Weight** |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **1** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **2** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **3** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **4** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **5** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

Determine if the bags are precise.

Largest net weight = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Smallest net weight = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Variance = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Do you consider the weights on the bags of chips to be precise? Why?

Prove if each bag is or is not accurate.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Bag 1** | **Bag 2** | **Bag 3** | **Bag 4** | **Bag 5** |
| **Net weight** |  |  |  |  |  |
| **Bag’s Printed Net Weight** |  |  |  |  |  |
| **Variance** |  |  |  |  |  |
| **Accurate?** |  |  |  |  |  |