

Name _____ Date _____ Period _____

HONORS BIOLOGY – LAB REPORT RUBRIC

INTRODUCTION:

- _____ / 1 The purpose or objective of the lab is clearly stated.
_____ / 1 The hypothesis is clearly stated in “if, then” format and makes a reasonable prediction.

PROCEDURE:

- _____ / 1 The basic materials used in the lab are clearly listed.
_____ / 1 The basic procedure for the lab is briefly explained.

RESULTS:

- _____ / 3 The qualitative and/or quantitative observations are included.
_____ / 2 Data is displayed in the appropriate formats, such as charts, graphs, data tables, diagrams, etc. All results sections have appropriate titles.

DISCUSSION:

- _____ / 4 The lab results are explained in a clear and concise manner.
All assigned lab questions are correctly answered in complete sentences.
_____ / 2 The explanation specifically refers to data.
_____ / 2 The explanation specifically refers to the hypothesis.
_____ / 2 The explanation discusses any problems and/or possible sources of error.

CONCLUSION:

- _____ / 2 The main points of the lab are summarized.
_____ / 1 One or more ways to improve or modify the lab are described.

APPEARANCE:

- _____ / 1 The lab report is typed: 12 point font, single-spaced, 1” margins.
_____ / 1 The lab report is free of spelling/grammatical/punctuation errors.
_____ / 1 The lab report has a title page which lists the following information:
title of lab, your name, name(s) of your lab partners, date.

TOTAL POINTS EARNED:

_____ / 25

What is Inside the Mystery Boxes?

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Date of Lab: September 8, 2014

Course: Honors Biology Period 5/6 A

INTRODUCTION:

In this investigation, students will learn about qualitative observations, quantitative observations, and inferences. The purpose of this lab is to correctly identify the contents of 10 mystery boxes without opening them. Students are allowed to shake, tap, or otherwise touch the boxes, but are strictly prohibited from looking inside.

HYPOTHESIS:

If I am given 10 mystery boxes, then I will correctly identify the contents of 7 of them.

MATERIALS:

1. 10 mystery boxes
2. notebook paper
3. pen or pencil

PROCEDURE:

1. The teacher will split the class into 10 lab teams of 2 students each.
2. Each lab team will receive 1 mystery box.
3. The lab teams will have 2 minutes to make a list of observations for each mystery box. The lab teams will also make at least one prediction as to the contents of the mystery box. The observations and predictions will be recorded on notebook paper.
4. After two minutes, the teacher will announce that it is time to pass the boxes to the next group.
5. Repeat steps 3 and 4 for each of the 10 mystery boxes.
6. The teacher will share the contents of the mystery boxes with the class.

RESULTS:

Table 1: Observations and Predictions

Box	Observations	Predictions	Actual Contents
1	-heavy when lifted -seems dense -makes a loud noise when tilted -seems hard	glue stick	bottle of glucose
2	-seem to be a lot of objects -most likely hard objects -sounds like pencils or crayons	crayons	21½ crayons
3	-shakes like a ball -seems hard -seems dense -seems like it is small (1-2 inches)	rock or mineral	halite
4	-seem to be a few objects -makes a loud noise when shaken -most likely hard objects	4 pieces of candy	5 cough drops
5	-the box cannot fully close -seems to be squishy -seems to be full of air	sponge	balloon
6	-makes a loud “thump” when tilted -seems to be heavy -seems like it is 2-3 inches long	glass jar	scorpion in a jar
7	-seems like a few small objects -seems like they are light-weight -makes a slight noise when shaken	3 thumbtacks	4 paper clips
8	-seems like nothing is in the box -object is extremely light weight -object barely moves when shaken -makes almost no sound when shaken	small piece of paper	sheet of paper
9	-seems like 2 round objects -makes a loud noise when shaken -the noise sounds like marbles	2 marbles	2 marbles
10	-seems to be a number of objects -sounds like pennies when shaken -objects seem to be very small	10 pennies	14 pennies

Table 2: Correct or Incorrect

Box	Contents	Correct?	Incorrect?
1	bottle of glucose		INCORRECT
2	21½ crayons	CORRECT	
3	halite	CORRECT	
4	5 cough drops		INCORRECT
5	balloon		INCORRECT
6	scorpion in a jar	CORRECT	
7	4 paper clips		INCORRECT
8	sheet of paper	CORRECT	
9	2 marbles	CORRECT	
10	14 pennies	CORRECT	

DISCUSSION:

As shown by data tables 1 and 2, I correctly identified the contents of 6 out of the 10 boxes. There were some cases in which I was very accurate. For example, I was 100% accurate at identifying boxes 8 and 9. I was also correct in identifying the contents of boxes 2 and 10, but I did not accurately predict the right number of objects. For boxes 3 and 6, I was close enough to be considered correct, but I lacked sufficient detail. For example, I knew that box 6 contained a jar, but had no idea that it had a scorpion inside. Also, I predicted the box 3 would contain a rock or mineral, but did not state that it was halite. Although my hypothesis was not correct, I was very close to being correct. I predicted that I could identify the contents of 7 boxes. In reality, I correctly predicted the contents of 6 boxes.

In this lab, we recorded three types of data: qualitative observations, quantitative observations, and inferences. A qualitative observation is a description. For example, the phrases “heavy when lifted” or “seems to be dense” are qualitative observations. A quantitative observation is one that includes some sort of number. For example, the phrases “2 inches long” or “contains 20 milliliters of water” are quantitative observations. An inference is something you determine to be true based on logic. For example, the phrases “objects seem to be very small” and “seems hard” are examples of inferences. All three types of data were used in this investigation.

The biggest problem with this lab is that I was limited in my observations. This lab could be improved if we were blind-folded and then able to directly touch the objects. Some of the “predictions” truly were just guesses. I feel that if I could have touched the objects (without seeing them), I would have correctly identified at least 8 or 9 of them. I also feel that 2 minutes per mystery box is not enough time. If I were the teacher, I would increase that time to 4 minutes per mystery box.

CONCLUSION:

This lab introduced our class to qualitative observations, quantitative observations, and inferences. We used all three to predict the contents of the mystery boxes. Although my hypothesis was not correct, I was able to identify 6 of the 10 objects. I would modify this lab by allowing students to touch the objects while being blind-folded.