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Anatomy & Physiology—Period 2  
Ms. Francois  
October 25, 2013



**Lab #2: Design an Experiment**  
**Lab Completed on 10/23/13**

**QUESTION:**

How many licks per minute (the rate) does it take to get to the center of a tootsie pop?

**INTRODUCTION:**

In this experiment, we are looking to see how many times a person would have to lick a tootsie pop per minute until they get to the center. In order to get this information, we had each member of the group lick a tootsie pop and record how many times they do per minute until they reach the center. If the number of times you lick the lollipop per minute increases then the size of the lollipop will decrease and you can get to the center quicker because your saliva causes the molecules of the lollipop to dissolve.

**VARIABLES:**

- Independent Variable: amount of licks per minute
- Dependent Variable: size of the lollipop
- Controlled Variables:
  1. Amount of time (1 minute)
  2. Size of the lollipop before experiment
  3. Same person
  4. Area where you are licking

**HYPOTHESIS:**

If the number of licks per minute increases then the size of the lollipop will decrease because your saliva, while you are licking, causes the molecules of the candy to dissolve.

**EQUATIONS:**

N/A

**MATERIALS:**

- Tootsie Pop (4)
- Stopwatch / Timer
- A Person To Lick The Tootsie Pop

**PROCEDURE:**

First, four tootsie pops were bought for each member of the group. Then all wrappers were unwrapped, the stopwatch was set to one minute. After, the group began to lick the lollipops. The amount of licks, after one minute, was recorded after the timer went off. Steps 3 – 5 were repeated until the center of the lollipop was reached.

**DATA AND CALCULATIONS:**

Is just put title on next page.

Observations ?

Since you wrote units on title of columns, don't need it in rows

**DATA:**

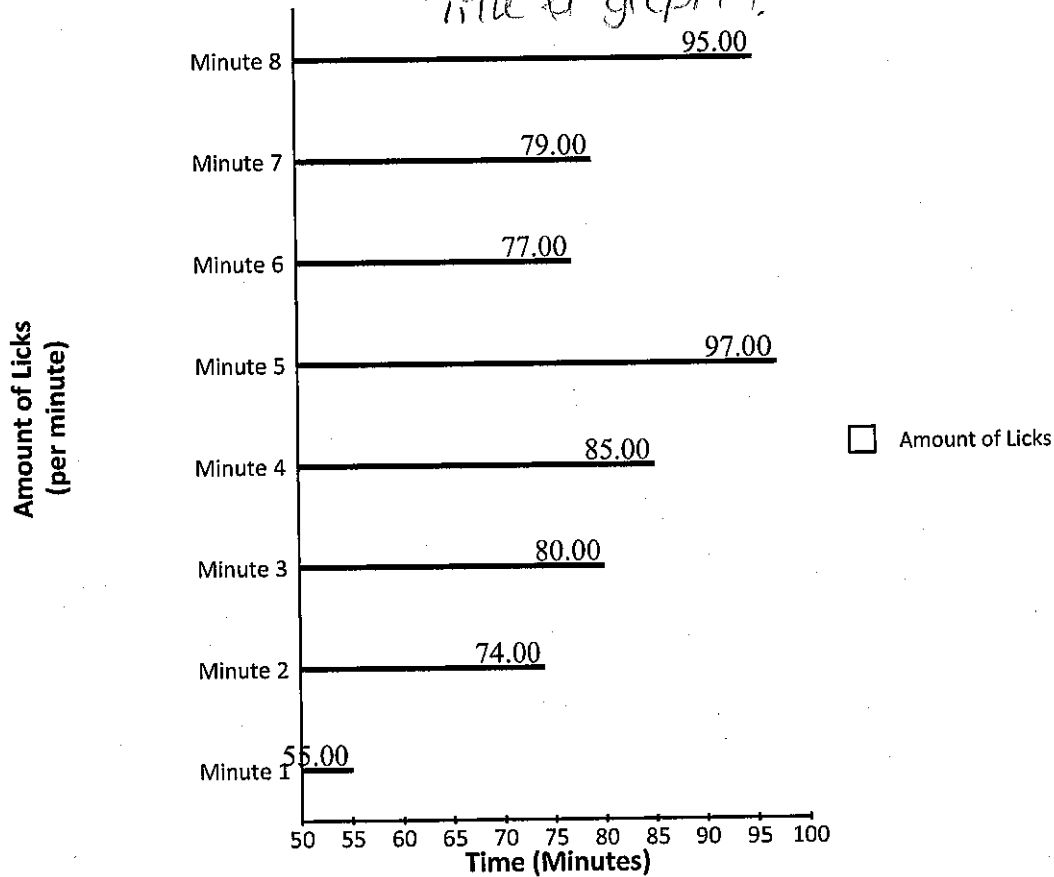
How Many Licks Does It Take to Get to the Center of the Tootsie Pop?	
Amount of Time (Minutes)	Number of Licks (Per Minute)
1 Minute	55 licks
2 Minutes	74 licks
3 Minutes	80 licks
4 Minutes	85 licks
5 Minutes	97 licks
6 Minutes	77 licks
7 Minutes	79 licks
8 Minutes	95 licks

**CALCULATIONS:**

Average Amount of Licks:  $55+74+80+85+97+77+79+95$

8

Title for graph?



I love the chart/graph!

**CONCLUSION:**

Based on the information given, my hypothesis was: if you increase the amount of times you lick a tootsie pop then the size of the lollipop will decrease because your saliva dissolves the candy of the lollipop. My hypothesis was proven to be correct. Looking through the data collected and I noticed that as I licked the lollipop more the shape and structure of it got smaller.

→ give an example from data

The experiment as a whole was quite successful. However, one thing that could've been changed was the rest time between the minutes that we had to record. Next time, I could have added a 30 second rest period between each session. Another thing that I could've changed was to keep the side of the lollipop that I was licking the same position. Next time, I can keep it on the same side and make sure everything else remained constant.

Still after completing the experiment, some things still intrigue me. I'm still curious about what exactly is it that causes the lollipop to shrink or to react to it. Also I wonder what is used to make these tootsie pops.

don't use contractions in formal writing

Name: \_\_\_\_\_

Ivelisse SantiagoPeriod: 2**SCIENCE LAB REPORT RUBRIC**

Category	Excellent (4 pts)	Proficient (3 pts)	Developing (2 pts)	Needs Revision (1 pt)
<b>Problem/Question</b>	<input checked="" type="checkbox"/> Problem is correctly identified. <input checked="" type="checkbox"/> No spelling/ grammar (s/g) errors.	<input type="checkbox"/> Problem is sufficiently identified. <input type="checkbox"/> Few s/g errors.	<input type="checkbox"/> Question is partially identified. <input type="checkbox"/> Some spelling/grammar errors.	<input type="checkbox"/> Question is incorrectly identified. <input type="checkbox"/> Many errors.
<b>Introduction</b>	<input checked="" type="checkbox"/> State the goals and objectives of lab <input checked="" type="checkbox"/> Describes what data will be collected <input checked="" type="checkbox"/> Briefly summarizes experiment <input checked="" type="checkbox"/> Describe how that data will be used to arrive at conclusions at the completion of the laboratory.	One key element is missing: <input type="checkbox"/> State the goals and objectives of lab <input type="checkbox"/> Describes what data will be collected <input type="checkbox"/> Briefly summarizes experiment <input type="checkbox"/> Describe how that data will be used to arrive at conclusions at the completion of the laboratory.	Two key elements are missing: <input type="checkbox"/> State the goals and objectives of lab <input type="checkbox"/> Describes what data will be collected <input type="checkbox"/> Briefly summarizes experiment <input type="checkbox"/> Describe how that data will be used to arrive at conclusions at the completion of the laboratory.	A confusing of misleading introduction missing more than 2 elements: <input type="checkbox"/> State the goals and objectives of lab <input type="checkbox"/> Describes what data will be collected <input type="checkbox"/> Briefly summarizes experiment <input type="checkbox"/> Describe how that data will be used to arrive at conclusions at the completion of the laboratory.
<b>Variables</b>	<input checked="" type="checkbox"/> Independent var. <input checked="" type="checkbox"/> Dependent var. <input checked="" type="checkbox"/> controlled variable.	One variable is missing: <input type="checkbox"/> Independent var. <input type="checkbox"/> Dependent var. <input type="checkbox"/> controlled variable.	Two variables are missing: <input type="checkbox"/> Independent var. <input type="checkbox"/> Dependent var. <input type="checkbox"/> controlled variable.	<input type="checkbox"/> All variables are missing.
<b>Hypothesis</b>	<input checked="" type="checkbox"/> Link between problem and predicted results direct and relevant. <input checked="" type="checkbox"/> Use if-then-because <input checked="" type="checkbox"/> Ind & Dependent variable featured <input checked="" type="checkbox"/> No s/g errors	<input type="checkbox"/> Reasonable link between problem and predicted results. <input type="checkbox"/> Use if-then-because <input type="checkbox"/> Ind./Dep var featured <input type="checkbox"/> Few s/g errors	<input type="checkbox"/> Weak link between problem and predicted results. <input type="checkbox"/> Missing if-then-because <input type="checkbox"/> Missing ind./dep. var. <input type="checkbox"/> Some s/g errors.	<input type="checkbox"/> Unreasonable link between problem and predicted results. <input type="checkbox"/> Missing if-then-because <input type="checkbox"/> Missing ind/dep var. <input type="checkbox"/> Many s/g errors
<b>Materials and Procedure</b>	<input checked="" type="checkbox"/> Includes list of all materials in bullets. <input checked="" type="checkbox"/> Procedure written in past tense <input checked="" type="checkbox"/> Does not use I, you, or we <input checked="" type="checkbox"/> Procedure in paragraph form using transition words <input checked="" type="checkbox"/> Specific <input checked="" type="checkbox"/> Refer to glassware instruments used <input checked="" type="checkbox"/> Includes any measurements <input checked="" type="checkbox"/> No s/g errors.	<input type="checkbox"/> Includes list of most materials in bullets. <input type="checkbox"/> Procedure written in past tense <input type="checkbox"/> Does not use I, you, or we <input type="checkbox"/> Procedure in paragraph form w/ transition words <input type="checkbox"/> Missing some specifics <input type="checkbox"/> Refer to glassware instruments used <input type="checkbox"/> Includes any measurements <input type="checkbox"/> Few s/g errors.	<input type="checkbox"/> Includes list of some materials in bullets. <input type="checkbox"/> Procedure written mostly in past tense <input type="checkbox"/> Uses I, you, or we sometimes <input type="checkbox"/> Procedure in paragraph form w/ missing transition words <input type="checkbox"/> Missing specifics—not in order <input type="checkbox"/> Refer to glassware instruments used <input type="checkbox"/> Includes any measurements <input type="checkbox"/> Some s/g errors.	<input type="checkbox"/> Includes list of a few materials in bullets. <input type="checkbox"/> Procedure not written in past tense <input type="checkbox"/> Uses I, you, or we <input type="checkbox"/> Not paragraph form/ missing transition words <input type="checkbox"/> Missing specifics—not in order <input type="checkbox"/> Does not refer to glassware/ instruments <input type="checkbox"/> Includes little measurements <input type="checkbox"/> Many s/g errors.
<b>Observations and Data Analysis/Calculations</b>	<input checked="" type="checkbox"/> Observations are plentiful and specific for each experiment <input checked="" type="checkbox"/> Charts and graphs are recorded where necessary. <input checked="" type="checkbox"/> Data is properly recorded in a coherent table <input checked="" type="checkbox"/> Proper calculations are carried out. <input checked="" type="checkbox"/> Proper units are used.	Missing one of the following: <input type="checkbox"/> Observations are plentiful and specific for each experiment <input type="checkbox"/> Charts and graphs are recorded where necessary. <input type="checkbox"/> Data is properly recorded in a coherent table <input type="checkbox"/> Proper calculations are carried out. <input type="checkbox"/> Proper units are used	Missing two of the following: <input type="checkbox"/> Observations are plentiful and specific for each experiment <input type="checkbox"/> Charts and graphs are recorded where necessary. <input type="checkbox"/> Data is properly recorded in a coherent table <input type="checkbox"/> Proper calculations are carried out. <input type="checkbox"/> Proper units are used	<input type="checkbox"/> No data table present. <input type="checkbox"/> Observations are vague and unclear. <input type="checkbox"/> Calculations unclear or incorrect.

Name: \_\_\_\_\_

Period: \_\_\_\_\_

# SCIENCE LAB REPORT RUBRIC

<b>Discussion and Conclusion</b>	<input type="checkbox"/> Restates hypothesis <input type="checkbox"/> States hypothesis is incorrect/correct <input checked="" type="checkbox"/> Data is analyzed thoroughly and correctly. It's used to support valid conclusions <input type="checkbox"/> 2 Sources of error in experiment explained <input checked="" type="checkbox"/> 2 ways to improve the experiment is explained <input checked="" type="checkbox"/> Asks a new question <input type="checkbox"/> Makes a connection to how experiment could be used in real life.	<input type="checkbox"/> One key element of conclusion is missing or not fully expanded upon: <input type="checkbox"/> Restates hypothesis <input type="checkbox"/> States hypothesis is incorrect/correct <input type="checkbox"/> Data is analyzed thoroughly and correctly. It's used to support valid conclusions <input type="checkbox"/> 2 Sources of error in experiment explained <input type="checkbox"/> 2 ways to improve the experiment is explained <input type="checkbox"/> Asks a new question <input type="checkbox"/> Makes connection of how experiment could be used in life	<input type="checkbox"/> Two key elements of conclusion are missing: <input type="checkbox"/> Restates hypothesis <input type="checkbox"/> States hypothesis is incorrect/correct <input type="checkbox"/> Data is analyzed thoroughly and correctly. It's used to support valid conclusions <input type="checkbox"/> 2 Sources of error in experiment explained <input type="checkbox"/> 2 ways to improve the experiment is explained <input type="checkbox"/> Asks a new question <input type="checkbox"/> Makes a connection to how experiment could be used in life	<input type="checkbox"/> Paraphrases manual with little data analysis <input type="checkbox"/> Conclusions may be wrong or data misinterpreted. <input type="checkbox"/> More than two key elements missing from conclusion.
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Category	Exemplary (4 pts)	Proficient (3 pts)	Developing (2 pts)	Needs Revision (1 pt)
Student's transitions are...	... varied and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.	... varied and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.	... appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.	... inappropriate and ineffective transitions in attempt to create cohesion and clarify the relationship between ideas.
Student's word choices show	...precise language, science-specific vocabulary to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the experiment's context as well as to the level of knowledge of likely readers.	...precise language and science-specific vocabulary to manage the complexity of the experiment's context as well as to the level of knowledge of likely readers.	...precise language and age-appropriate vocabulary to inform about or explain the experiment completed.	...imprecise language and age-appropriate vocabulary to inform the reader about the experiment.
Student's tone	...is formal, objective, and established early and maintained throughout the lab report.	...is formal and/or objective, and may occasionally become information/subjective without hindering the overall integrity.	...is provides for a formal style and objective reading.	...is established but is neither formal nor objective.
Student's illustration	Drawing goes beyond in a significant way, e.g. drawing is particularly clear, colorful	Drawing is neat, easy-to-read, and completely labeled.	Drawing is missing key labels; is sloppy; is misleading.	Drawing missing, illegible, or not included.
Student's presentation	Extremely neat, organized, and presentable.	Looks OK	A really rushed job	Completely illegible

TOTAL SCORE ON REFLECTION: 45 / 48 + 2 points for heading

SCORE = 94%