Final Lab Report

Question:

How can we reduce stress amongst teenagers?

Hypothesis:

If we create an app that provides methods to reduce stress, then it will alleviate stress because of the strategies provided.

Materials:

- Hype 3
- Color Hex code
- Macbook
- Natural Gum Base
- Natural Spearmint/Grapefruit/Lavender Flavors
- Sugar
- Corn syrup
- Powdered Sugar
- Cookware
- Rolling pin
- Measuring instruments
- Parchment Paper
- Blood Pressure Cuff
- Stethoscope
- Chromebooks

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- Adult Coloring Guide

Independent Variable:

The independent variable includes our 3 stress reducing strategies; adult coloring, natural gum with stress reducing flavors, and white noise.

Dependent Variable:

The dependent variable is the Blood Pressure and Heart Rate of the students who we used to test our stress reducing methods.

Constants:

Test subjects, classroom, students measuring, time to take stress test, time of day, same blood pressure cuffs

Control:

Our control is the baseline blood pressure and heart rate of students before taking the stress test.

Procedure:

1. Coloring Experiment
    a. Gather baseline blood pressure and heart rate from each student
    b. Give stress test for 5 minutes (Link to stress test http://www.notdoppler.com/thefrustrationgame.php)
    c. Take blood pressure and heart rate again
    d. Record to see difference from before stress test
    e. Distribute coloring pages and utensils

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f. Allow test subjects to color for set time (link to coloring image: http://homedesignlatest.site/wp-content/uploads/12/06/color-ing-page-getingpages com-s-pages-free-s-cool-owl-designs-to-color-ing-pages-free-image-result-for-cof fee-house-how.jpg)

g. Take blood pressure and heart rate

h. Compare to previous recordings of blood pressure and heart rates

2. White Noise Experiment

a. Gather baseline blood pressure and heart rate from each student

b. Give stress test for 5 minutes http://www.notdoppler.com/thefrustrationgame2.php)

c. Take blood pressure and heart rate

d. Record data to see difference from before stress test

e. Play relaxing noise for set time (https://youtu.be/IvjMgVS6kng)

f. Take blood pressure and heart rate

g. Compare to two previous recordings of blood pressure and heart rates

3. Gum Experiment

a. Gather baseline blood pressure and heart rate from each student

b. Give stress test (http://www.cat-mario.com/)

c. Take blood pressure and heart rate

d. Record data to see difference from before stress test

e. Distribute gum

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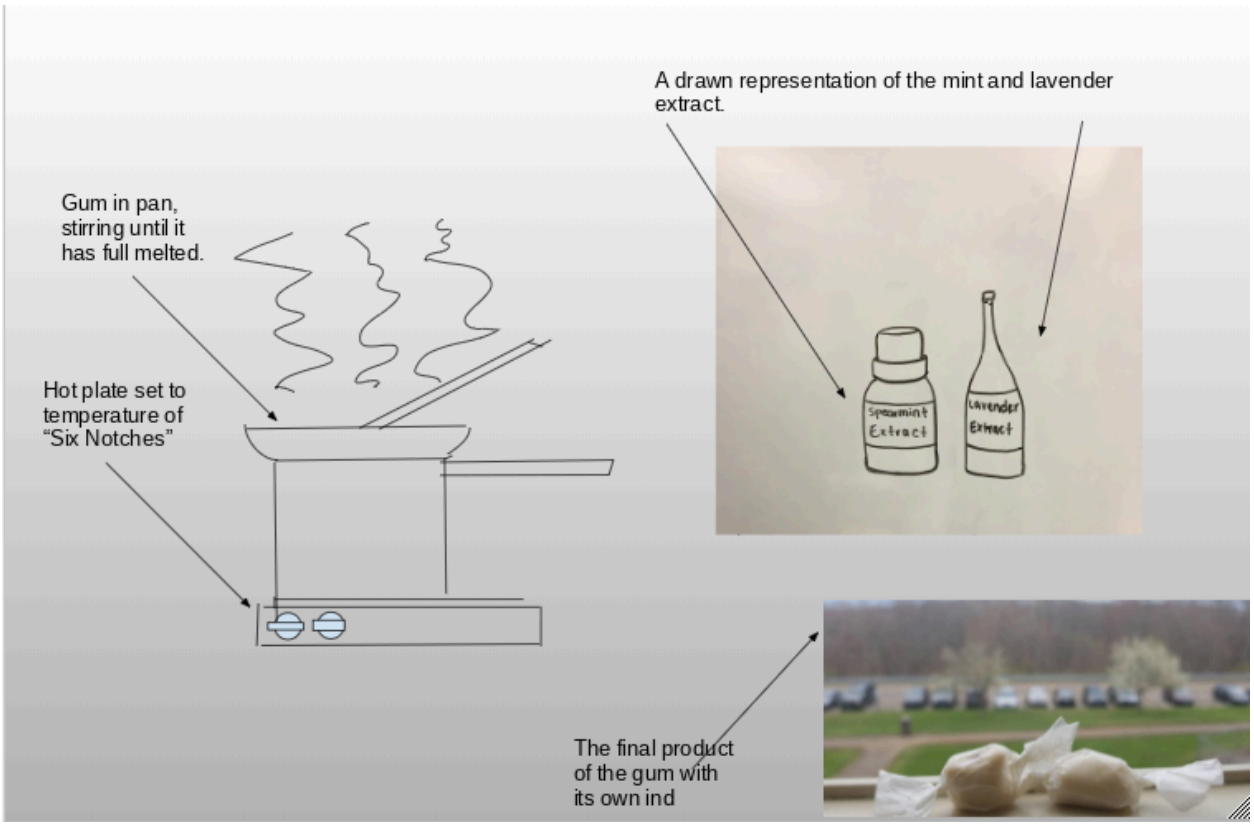
f. Allow subjects to chew gum for set time

g. Take blood pressure and heart rate

h. Compare to two previous recordings of blood pressure and heart rate



Quantitative Observations- Coloring - 5/10 reduced BPM 7/10 reduced Blood Pressure, White Noise - 4/9 reduced BPM 8/9 reduced Blood Pressure, and Gum - 6/10 reduced BPM 8/10 reduced Blood Pressure.

Qualitative Observations - During the coloring test, the owl's were said to be a cute cartoon. During the sound running water made a relaxing noise, and for the gum lavender had a calming scent, Grapefruit was sour, and Mint had the best flavor that made your breath fresh.

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Results:

Data Table 1:4 Change in blood pressure and heart rate after coloring

	Pre Test		Post Test		After Coloring Pages	
Name, Gender, Grade	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure
Dom, M, 12th	68	120/81	80	128/76	92	125/85
Ryan, M, 12	64	110/55	72	120/70	72	110/70
Jordan, F, 12	70	128/64	85	130/70	71	126/64
Richard, M, 12	103	122/64	88	124/60	89	114/60
Kelly, F, 11	68	115/70	80	120/80	68	110/72
Mary, F, 11	80	110/68	86	121/79	83	112/65
Alana, F, 10	72	120/62	88	120/50	96	120/60
Anthony, M, 9	76	120/75	85	120/70	70	125/66
Donna, F, 9	95	120/75	98	127/78	109	125/66

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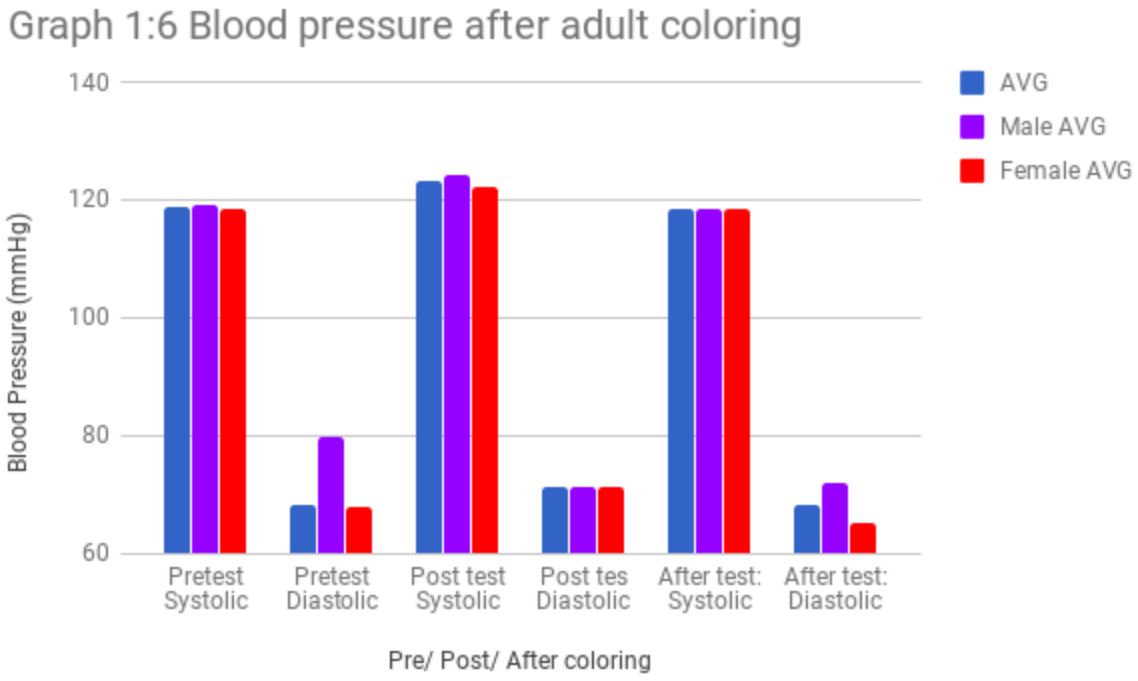

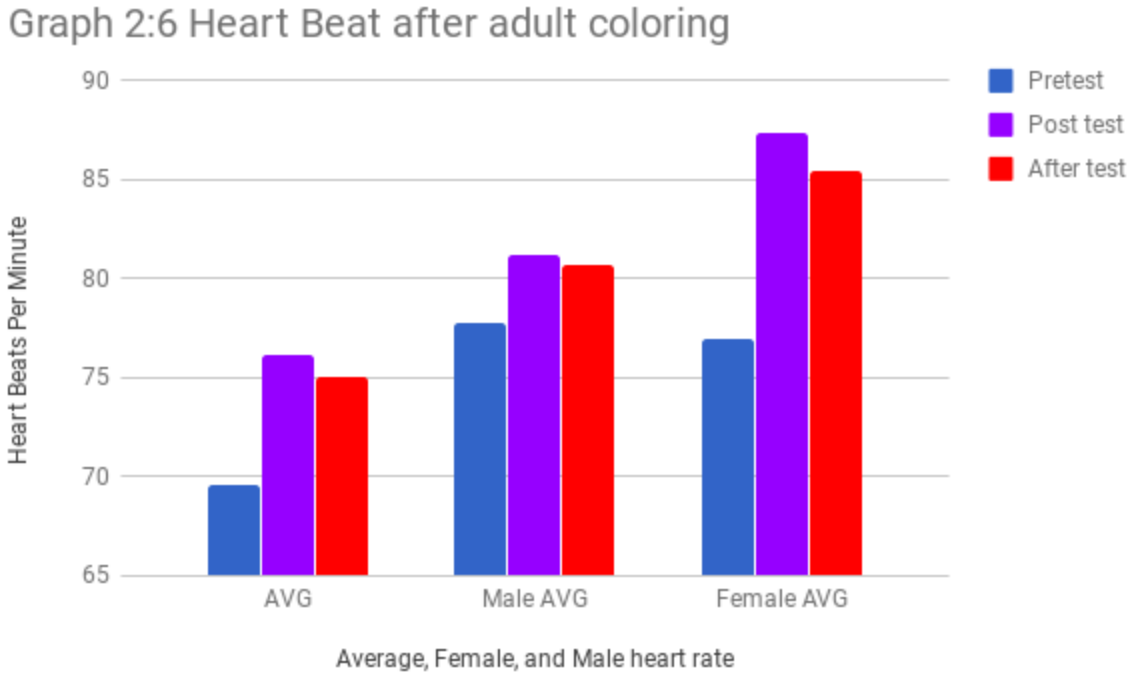

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Data Table 2:4 Change in blood pressure and heart rate after white noise

	Pre Test		Post Test		After Listening to Noise	
Name, Gender, Grade	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure
Dom, M, 12th	67	121/47	66	104/60	67	110/165
Ryan, M, 12	71	140/60	73	140/64	81	130/60
Jordan, F, 12	70	118/62	72	120/72	70	114/64
Richard, M, 12	92	119/70	100	123/82	96	115/90
Paige, F, 11	71	114/67	79	125/71	68	110/63
Kelly, F, 11	81	124/73	86	136/78	74	116/69
Mary, F, 11	87	117/63	79	124/79	87	126/72
Alana, F, 10	67	115/70	72	111/60	76	110/62
Anthony, M, 9	73	110/63	69	120/72	70	119/73
Donna, F, 9	92	121/47	68	120/65	70	118/70

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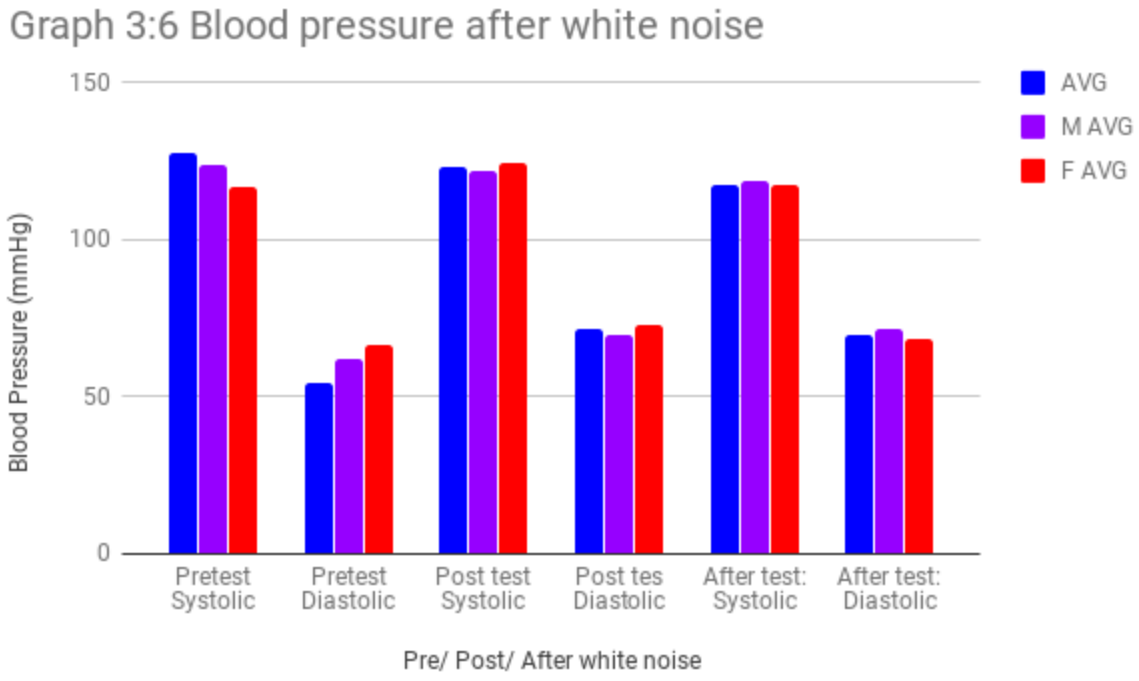

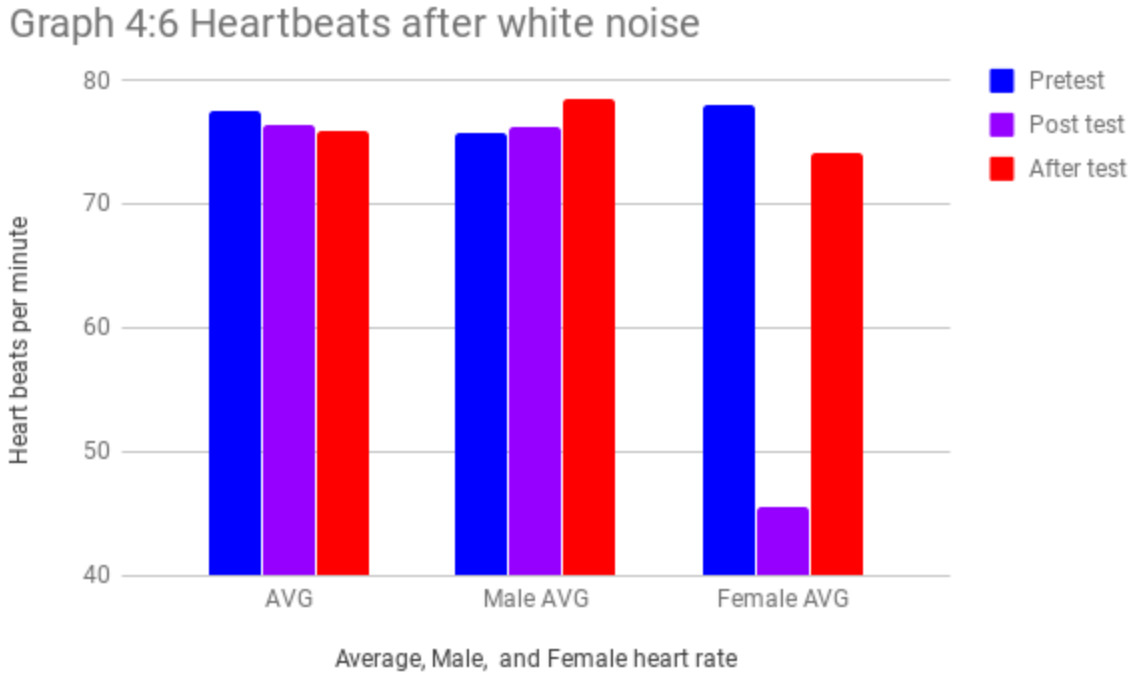

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Data Table 3:4 Change in blood pressure and heart rate after gum

	Pre Test		Post Test		After Chewing Gum	
Name, Gender, Grade	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure	Heart Rate	Blood Pressure
Dom, M, 12th	70	120/76	80	120/82	79	122/78
Ryan, M, 12	72	116/65	74	122/68	74	120/68
Jordan, F, 12	77	86/55	71	91/51	71	93/52
Richard, M, 12	76	120/82	80	124/68	78	120/60
Paige, F, 11	79	115/67	81	120/69	74	119/65
Kelly, F, 11	76	124/62	80	124/60	74	118/62
Mary, F, 11	80	107/68	82	110/72	82	108/76
Alana, F, 10	80	110/60	86	131/86	79	126/81
Anthony, M, 9	74	110/68	84	125/70	80	100/70
Donna, F, 9	68	118/60	72	122/68	70	120/66

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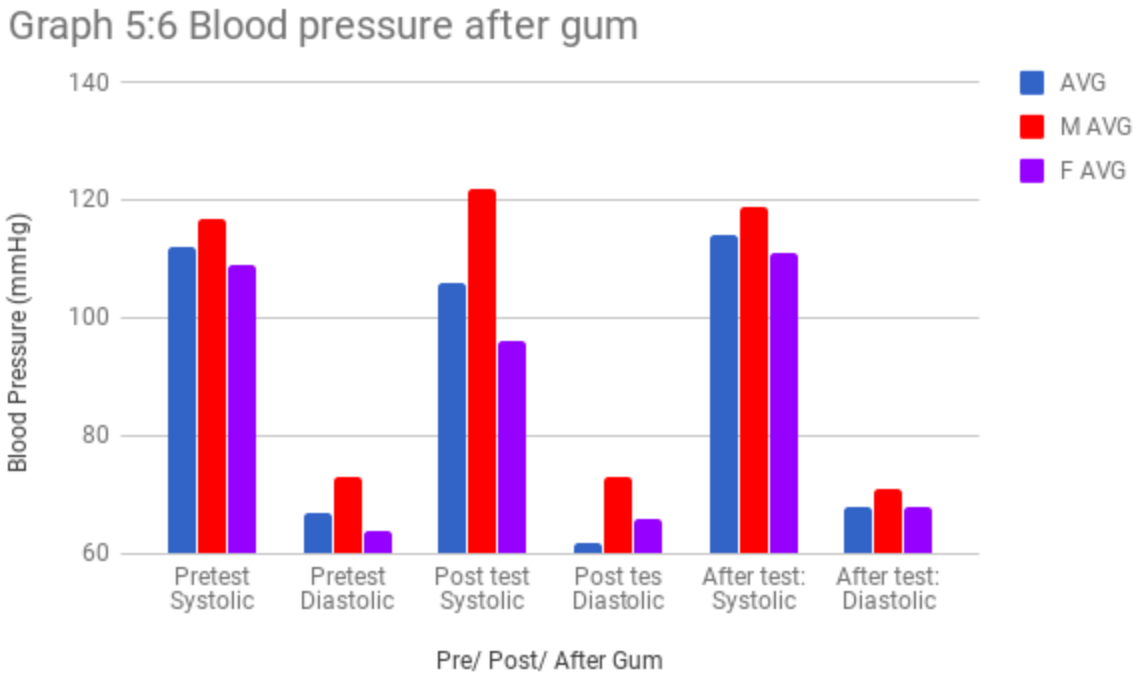

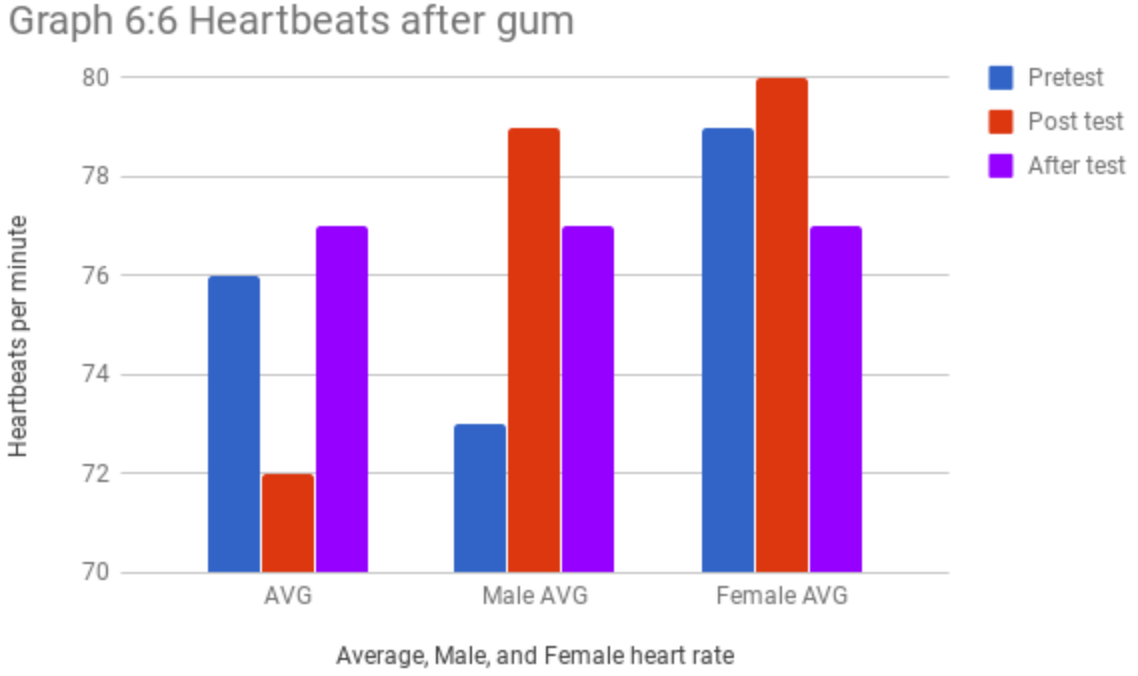

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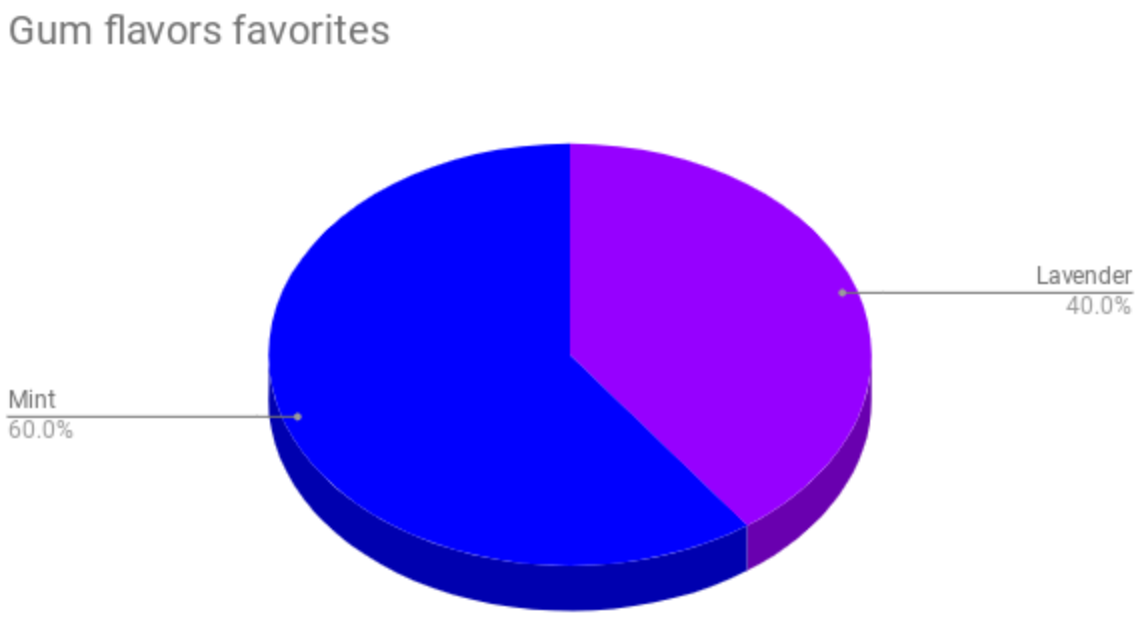
Data Table 4:4 Most Popular Gum Flavor

Gum Flavor	Number of students selected gum flavor
Spearmint	6
Lavender	4
Grapefruit	0



Conclusion:

In this lab, the problem being investigated was “How can we reduce stress amongst teenagers?” It was hypothesized that if we created an app that provides methods to reduce stress, then it will alleviate stress because of the strategies provided. After completing this lab, it was determined

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that our strategies for reducing stress were effective. To prove this, we tested 3 different aspects of our app. Our first experiment is represented in Data Table 1:4 Change in blood pressure and heart rate after coloring, the data shows that the test subjects benefitted significantly. 5/10 of the subjects saw reduction in beats per minute and 7/10 saw reduction in blood pressure. The reason for this improvement in stress levels is that "the practice generates wellness, quietness and also stimulates brain areas related to motor skills, the senses and creativity" (https://www.huffingtonpost.com/2014/10/13/coloring-for-stress_n_5975832.html).

As seen in Data Table 2:4 Change in blood pressure and heart rate after noise, the 4/9 of the students saw reduction in beats per minute and 8/9 of the students' blood pressure curtailed. We expected these results seeing as our research says, "Noise can have a profound effect on both the emotions and the body… quiet your mind and relax your muscles, making you feel soothed while releasing the stress of the day. Noise is effective for relaxation and stress management" (https://www.unr.edu/counseling/virtual-relaxation-room/releasing-stress-through-the-power-of-music). We saw the most significant positive results in our last experiment when we tested our gum. 6/10 students saw lower numbers in beats per minute and 8/10 lessened in blood pressure as well. This data supports our research that says, "*Journal of Oral Rehabilitation* explained that muscle contraction from chewing is a form of exercise, and may have effects on the autonomic nervous system. Chewing stimulates the vagus nerve in the brain, which acts to lower heart rate, and may in turn increase feeling relaxed" (http://www.mindthesciencegap.org/2012/11/13/chewing-gum-a-way-to-relieve-stress/).

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Our hypothesis was, in fact, supported by this data. We envisioned that our strategies would be efficient and we were correct. Each experiment showed improvement in stress levels. This experimentation was valid as well. There were many constant variables such as the environment and time allowed to use the "destressing" elements. Overall, this experimentation was valid and efficient.

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