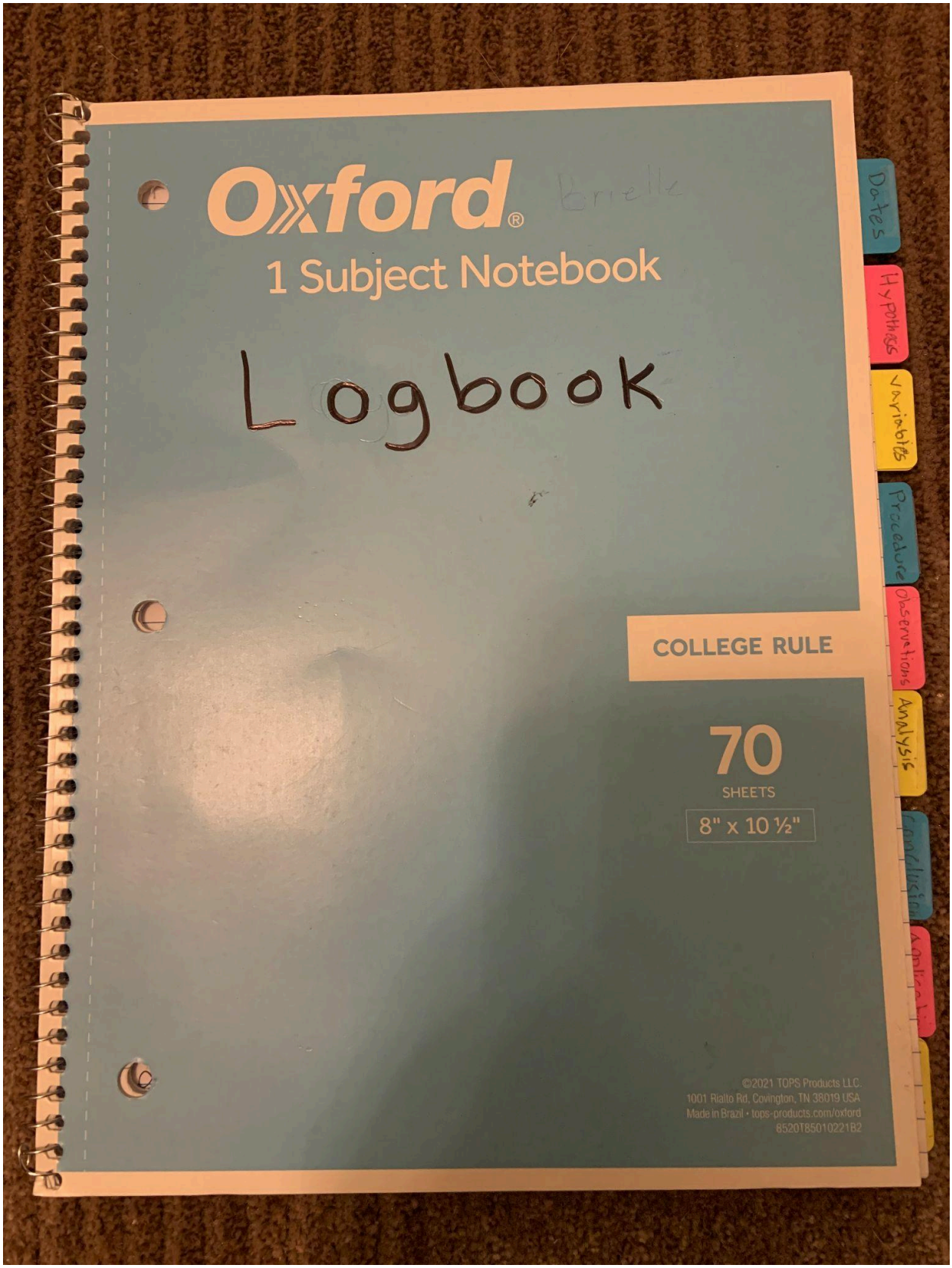
Oxford
Brielle
1 Subject Notebook
Logbook
COLLEGE RULE
70
SHEETS
8" x 10 ½"
©2021 TOPS Products LLC.
1001 Rialto Rd, Covington, TN 38019 USA
Made in Brazil • tops-products.com/oxford
8520T8501022182
Dates
Hypothesis
Variables
Procedure
Observations
Analysis

Brielle's

Science Fair Logbook

Dates | Hypothesis | Variables | Procedure | Observations | Analysis | Conclusion

Date

Tuesday, Feb 18
- Made list of supplies and ordered them
  Monday, Feb 20 - light meter arrives

Saturday, Feb 22
- Started Hypothesis
- Conducted Secondary Research
- Conducted Primary Research by measuring Lux of street lights

Sunday, Mar 2
- Worked on Hypothesis
- Started process
- Started variables

Monday, Mar 3
- Completed 6 eye tests
  - wrote observations

Saturday, Mar 8
- Completed 4 eye tests
- wrote observations
- Completed Hypothesis
- worked on variables
- picked up trifold

Sunday, Mar 9
- Completed eye tests left (18 + extra)
- wrote eye test results on computer
- bought materials for trifold
- wrote observations

Sunday, Mar 16
- formated Result table
- Did Reaserch to deepen understanding
- added to Hypothesis
- worked on trifold
- submitted reasearch
- worked on Analysis
- worked on Application
- worked on Sources of Error

Monday, Mar 17
- Completed Hypothesis
- Completed Procedure
- Completed Variables
- took pictures of Procedure
- Put test results in Logbook
- wrote analisis
- wrote conclusion
- wrote Application
- wrote Sources of Error

Hypothesis

Before research

If a person does an eye test under blue light and purple light, the number of letters identified will be greater under the white light because the human eyes naturally accustomed to white light from the sun.

after research

The results of an eye test will be better when the light is white rather than when it is blue/purple for many reasons. first the white lights are almost 10 Lux higher than the purple streetlights. second, we are adaped to using white lights to see eveyday and are used to it. third becaus of How your eyes have cone photo receptors that are good at seeing details and work well in bright light. there are also rod photo receptost that see shapes and are in your perepheral vision, these are used when it is dark. having the cones see detail will be able to help determine wich letter is writen

Variables

Independant Variables

- Light colours (purple or white)

Dependant Variables

- amount of letters identified correctly

- eye chart used (Snellen)
- light in testing environment (0) lux
- light LUX (≈19)
- distance from the eye chart (20ft)
- Lamp used

Materials

- lamp that can be dimed and change colour
- Painters tape
- eye chart
- light meter
- mesuring tape
- result table

Observations
Analysis
Conclusion
Application

Procedure

- Measure 20ft from wall
- Set up lamp
- Turn off room light
- turn on lamp
- Test LUX of blue light with light meter and adjust to ≈19 LUX
- tape eye chart under light
- let participant enter room and stand at 20ft

Eye test

1. ask participant to read chart from top to bottom
- record results (number of letters correctly identified
- Change lamp colour to white and adjust to ≈19 Lux
- place eye chart on wall
- Ask participant to read eye chart
- Record results
- Ask age
- Ask if they are wearing glasses/contacts or not
- thank them for their participation

Procedure | Observations | Analysis

Observations

Mar 3

There is a really big diffrence in the tests. The white lights have been a lot more visibe than the purple ones

Mar 8

participants are seeing many more letters under white light than purple light. and the results are pretty consistent

Mar 9

Participants can identify more letters under white light than under purple light. But it was a little more even

	Male Female (M/F)	age	eye correction ✓ ✗ G/C	colour blindness ✓ ✗	white results	purple results
1	F	48	✓ G	✗	45	10
2	F	49	✗	✗	17	0
3	M	49	✗	✗	37	6
4	F	189	✗	✗	22	4
5	F	15	✗	✗	41	15
6	F	44	✓	✗	36	8
7	M	75	✗	✗	25	8
8	F	76	✓	✗	12	2
9	M	48	✗	✗	38	19
10	M	14	✗	✗	16	8
11	M	16	✗	✗	24	20
12	F	49	✓	✗	36	13
13	F	46	✓	✗	30	2
14	M	47	✗	✗	21	3
15	F	61	✓	assignment	21	13
16	F	14	✗	✗	31	23
17	F	70	✓	✗	25	15
18	F	25	✓	✗	27	14
19	M	60	✓	✗	34	20
20	F	7	✗	✗	31	19
21	F	48	✗	✗	22	17
22	F	59	✓	✗	23	17
23	M	15	✗	✗	36	23.5
24	M	17		✓	30	17
25	F	54	✓	✗	39	24
26	F	52	✓	✗	44	27
27	M	14	✗	✗	38	20
28	M	49	✗	✗	44	21
29	F	48	✓	✗	42	22
30						

	M/F	age	glasses	colour blindness	white	Purple
30	F	16	X	X	42	14
31	F	13	✓	X	9	0

Analysis

- Hypothesis correct!
- white light is better for visibility
- avrage # letters correct purple = 13.35 → 13
- avrage # letters correct white = 30.35 → 30
- # white was consistently higher with some participants recongnising more 50 on chart
- purple = number correct was allways lower with times when people coulbnt read anything
- good for hypothesis that white light = good visibility cuz provides more light for cone photo receptors (sharp + detailed)
- the change in colour makes you use rod photoreceptors that arent good at seeing details so its hard to determine letters
- the results consistantly show that white light provides a significant advantage for reading, and clarity.

1. Impact of corrected lenses

eye correction	Aurage P	Aurage W
Yes	13.78	30.78
No	13.08	29.72

No significant difference

2. Age comparison

Age	Av P	Av W
under 18	14.9	29.8
18-59	12.94	32.69
60+	11.6	24

No significant difference
Seniors had worst scors

3. Gender comparison

Gender	Avg. P	Avg. W
Male	12.45	29.75
Female	15	31.45

No significant difference

4. Colour Blindness

Not enough information
(only one person)

Conclusion

- purple light makes it hard to see
- Decrese in visibility is not impacted by classes or contacts wich sudjests that the issue is all due to how the eye sees light
- age makes a small diffrence. older adults in general had the hardest time recenghsing letters for purple lights but the white lights was pretty avrage
- there is no significant diffrence for gender
- overall the experiment proved that lighting conditions impact visibility specificaly white light improves visibility and purple reduces visibility these findings can be used to Impove lighting on city streets

Application

- these findings sudjest that the defective purple/blue street ligts could lead to safty issues

- These results could be used to convince public agencies to repair or replace malfuctioning lights

Sources of Error

- only one caallard blind person
- More people for more accurate results
- Same amount of Females and Males to see if that makes a diffrence
- more variety in ages to see if that makes diffhence
- Some participants may have guessed letters
- Not said they had contacts
- undaiagnossed visual things