Title

Dry Erase: Trash or Treasure?

Student ID: \_\_\_\_\_\_\_\_\_\_\_\_\_

Problem

Many teachers use dry erase markers to write information to communicate to students. However, dry erase markers can be quick to dry out. When these markers dry out, they are placed into the trash as they are not recyclable. In 2018 there were 3.2 million full-time teachers in the US (Riser-Kositsky, 2019). A teacher will use up at least 5 dry erase markers a year. Resulting in 16 million dry erase markers per year being thrown into the trash. The average dry erase marker weighs approximately 1.6 grams. The resulting dry erase marker waste can reach 2,560 kg of waste. Therefore, many teachers may want to know which dry erase marker will last the longest without drying out.

Riser-Kositsky, M. (2019, July 22). Education Statistics: Facts About American Schools. Retrieved from https://www.edweek.org/ew/issues/education-statistics/index.html.

Hypothesis

If three different dry erase marker brands are used and left with the lids off, then the Expo brand marker will continue writing the longest.

Materials

1 – Red dry erase marker (to create chart for data)

3 – Black Chisel tip black Expo dry erase markers (independent variable)

3 – Black Chisel tip black Jot dry erase markers (independent variable)

3 – Black Chisel tip black Staples dry erase markers (independent variable)

1 white board

1 timer

Evidence / Research

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Corona, L. (2019, October 25). The best dry erase marker set. Retrieved from <https://www.chicagotribune.com/consumer-reviews/sns-bestreviews-office-the-best-dry-erase-marker-set-20191024-story.html>.

Summary: Many different dry erase markers are used. This article provides some of the names of the most commonly used markers. Those markers are the ones used in this project

Riser-Kositsky, M. (2019, July 22). Education Statistics: Facts About American Schools. Retrieved from <https://www.edweek.org/ew/issues/education-statistics/index.html>.

Summary: This article described the tools of teachers and how many markers they may go through a day. The data was used to decide if there was a viable problem with dry erase markers.

Schlosser, K. (2019, November 5). Whiteboard this: Biodegradable dry erase marker is one idea in tough fight against single-use plastic. Retrieved from <https://www.geekwire.com/2019/whiteboard-biodegradable-dry-erase-marker-one-idea-tough-fight-single-use-plastic/>.

Summary: There are different types of dry erase markers. There is a biodegradable type, however it was not readily available and was not a good match for this experiment.

Strauss, V. (2019, November 8). 'I am a scavenger': The desperate things teachers do to get the classroom supplies they need. Retrieved from <https://www.washingtonpost.com/education/2019/11/08/i-am-scavenger-desperate-things-teachers-do-get-classroom-supplies-they-need/>.

Summary: This article stated that the most used teacher tool is the dry erase marker.

Procedure

Three dry erase markers with chisel tips were purchased of each dry erase marker brand: Expo, Staples, and Jot. One dry erase board was also purchased to use to write on.

Black chisel tip Expo, Staples, and Jot markers are independent variables.

1. Create 3 columns with the RED dry erase markers labeled: Expo, Staples, Jot
2. Uncap the Expo dry erase markers.
3. Draw one 10 cm vertical line on the white board under the Expo column.
4. Place marker, uncapped, on a solid flat surface.
5. Uncap the Staples dry erase markers.
6. Draw one 10 cm vertical line on the white board under the Staples column.
7. Place marker, uncapped, on a solid flat surface.
8. Uncap the Jot dry erase markers.
9. Draw one 10 cm vertical line on the white board under the Jot column.
10. Place marker, uncapped, on a solid flat surface.
11. Set timer for 10 minutes
12. When timer goes off create another line with all 3 markers following steps 2 – 11 until the vertical line is no longer visible on the white board.

When experiment is complete, recreate experiment with additional purchased dry erase markers for a total of 3 trials.

Observations / Results

Three brands of dry erase markers were tested to determine the life of the marker when the lid is left off for a period of time. At first, all markers seemed to be marking well. However, at the 60-minute mark the markers began to show signs of change.

The Staples marker was the first marker to begin to fade. The Expo and Jot markers were still writing legibly at the 90-minute time line where the Staples marker was not longer writing at all. The next marker to show signs of fading was the Expo marker. Where the Jot marker was fading at the 120-minute mark, the Expo had become dried significantly and would not be considered visible. The Jot marker finally failed at the 150-minute time.

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| --- | --- | --- | --- |
|  | Expo | Staples | Jot |
| 10 min | 100 | 100 | 100 |
| 20 min | 100 | 100 | 100 |
| 30 min | 100 | 90 | 100 |
| 40 min | 100 | 90 | 100 |
| 50 min | 90 | 70 | 100 |
| 60 min | 80 | 50 | 90 |
| 70 min | 70 | 30 | 80 |
| 80 min | 60 | 10 | 80 |
| 90 min | 50 | 0 | 70 |
| 100 min | 40 | 0 | 70 |
| 110 min | 20 | 0 | 60 |
| 120 min | 0 | 0 | 50 |
| 130 min | 0 | 0 | 40 |
| 140 min | 0 | 0 | 20 |
| 150 min | 0 | 0 | 0 |

**Data Scale**

100% is full color of marker

50% is partially faded marker

0% is marker no longer visible

Conclusions

Based on the results of the experiment, the Jot dry eraser will write the longest with the cap left off of the marker. I originally thought the Expo marker would write the longest due to the increased cost and the brand marketing. I expected the Jot marker, being that it is an inexpensive Dollar Store™ brand marker, to fair the worst. I was wrong on both accounts.

Data shows that all three markers will continue to write when the cap is left removed for a small amount of time. But when time reaches about 30 minutes to an hour all markers will show signs of drying out.