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| Name: Schooly McSchoolface | School: **Swift Creek M.S.** | Teacher: **Mr. Hanna** | Pd: 6 |

**Science Fair Project**

**Research Plan (EXAMPLE)**

**Project Title**: Innies vs. Outies: The Effect of Bellybutton Type on Lint Accumulation

**Research Question**: How does bellybutton type affect the amount of lint accumulation over time?

(***PLEASE NOTE:* *This example investigation would be COMPLETELY INAPPROPRIATE for a science fair project!***)

**Variables**:

 **Independent Variable**: bellybutton type

 **Dependent Variable**: amount of lint accumulated in the bellybutton

 **Controlled Variables**: hygiene, schedule of lint collection, types of clothes worn

**Rationale (Purpose)**: I found that I was constantly digging lint out of my bellybutton and wondered if the amount of lint in my belly button was unusual, and if so, whether the shape of my bellybutton was the cause. My project may have a profound impact on medical understanding of bellybuttons and personal hygiene, as well as far reaching impact on the clothing and bathing industry.

**Background Information:** In an article by Sue Rishell in the Journal of Navel Medicine, I found a summary of research that claims “Lint from wool sweaters has been found in bellybuttons in significantly higher proportions than any other type (Rishell, 2004).” In a separate study, researchers found that people remove an average of about 7 cm3 of lint from their bellybuttons annually (Wetherington, 2008). While there is quite a bit of research about the amount of bellybutton lint and its sources, there is little research about the role that bellybutton type plays in lint accumulation. According to one study, approximately 82% of adults in the United States have what is considered to be an “innie”, while only 8% have an “outie”; the other 10% fall somewhere in between (McIntosh, 2016).

**Hypothesis**: Bellybutton shape determines the amount of lint accumulation over time.

**Prediction (Expected Outcome):** The average lint accumulation will be greater in individuals with “innies” than it is for those with “outies”. There will be a positive correlation between the depth of the “innie” and the amount of lint accumulated within the bellybutton.

**Materials List**:

* 20 volunteers with different belly-button shapes (with volunteer consent forms)
* Small ruler to measure belly button depth
* Rubber gloves to prevent contact between investigator and test subjects
* Small pair of tweezers to remove lint from bellybuttons
* Digital scale capable of measuring mass to at least three decimal places
* Camera to record visual evidence

**Procedures**:

1. Select 20 volunteers and complete volunteer consent paperwork.
2. Schedule daily data-collection times for each volunteer (preferably during evening hours).
3. Record data describing the depth/height of each bellybutton for each participant.
4. Assign participants specific shirts to wear throughout the day to ensure the shirt type does not affect the lint accumulation.
5. At daily data-collection times, carefully remove lint from the participant’s bellybutton with tweezers, making sure to wear rubber gloves to prevent skin-to-skin contact with participant.
6. Measure and record the mass of the lint removed from each subject.
7. Dispose of lint and rubber gloves in a medical waste container. Sterilize tweezers between participants.
8. Calculate an average lint accumulation for each participant.
9. Graph the average lint accumulation versus bellybutton depth using a scatter-plot.

**Risk & Safety:**

* Care must be taken to protect the privacy of each participant and their information.
* Care must be taken when using the tweezers to remove lint that the tweezers do not injure the participant.
* The researcher must wear gloves to prevent skin-to-skin contact and germ transfer during collection.
* Waste materials must be disposed of in a medical waste container.

**Data Analysis:** I plan to record the daily lint accumulated in each participant’s bellybutton by mass. I will calculate an average by adding up the total amount of lint collected from an individual and dividing it by the number of collections. I will graph the average lint accumulation versus bellybutton depth on a scatter plot. I’ll be looking for a correlation between the two variables which will be shown by a trend in the data points. If there is a trend, it will be shown as a positive correlation (trend-line with a positive slope), a negative correlation (trend-line with a negative slope), or no correlation (trend-line with zero slope or no discernable trendline).

**Research (Bibliography)**:

Hanna, Robert. *What Kind of Weirdo Writes a Book About Collecting Lint From Bellybuttons*. StrangeBooks, 2009.

McIntosh, Brandy. “The Fascinating Shapes of Bellybuttons.” *Journal of Navel Medicine*, vol. 33, no. 4, 2016, pp. 14–22., doi:10.1007/bf02361391.

Rishell, Sue. “The Perfectly Useless Bellybutton.” *Journal of Navel Medicine*, vol. 21, no. 2, 2004, pp. 39–51., doi:10.1007/bf02361391.

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Wetherington, Ron. “My Incredibly Creepy Study on Bellybutton Lint.” *Journal of Navel Medicine*, vol. 25, no. 1, 2008, pp. 36–41., doi:10.1007/bf02361391.