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| Topic of Lesson | Buyer Beware! |
| Course Title | Introduction to Statistics (MAT120) |
| Rationale as to how/why sustainability topic fits into course | The intention of this lesson plan is to involve students with not only collecting the data, but also learn from the data they collect. This exercise makes the students aware of the ingredients used in the cosmetic products they purchase and shows how it can negatively impact their health as well as environment. |
| Preliminary/Prior Knowledge | Simple probability |
| Concept/topic to teach | Sustainability and probability |
| Learning outcomes | Students will learn how to collect data and use them to practice simple probability. This exercise will also make them aware that although FDA is required to test products for human consumption, it is estimated that only 15% of today’s cosmetics have been truly tested. Also, while other countries have banned a variety of ingredients found in everyday cosmetics because of their potentially harmful side effects, the US has chosen not to ban these same products. Therefore, it is up to the consumer to be aware of the potential harm some products may incur. |
| Procedure | 1. Ask students to choose 6 cosmetic products, one of each of the followings: Lotion, Nail product, Sunscreen, Cleanser, Deodorant, Hair product. 2. Hand out the list of potentially toxic ingredients found in cosmetics and the student worksheet. (The list is attached)  |  |  |  |  | | --- | --- | --- | --- | | **Type of Product** | **Product Name** | **Number of Toxic Ingredients Found** | **Toxins found listed by number (from above)** | | Example: Lotion | Lubriderm | 4 | 7, 11, 12, 13 | | **Lotion** |  |  |  | | **Hair product** |  |  |  | | **Body/face cleanser** |  |  |  | | **Nail product** |  |  |  | | **Sunscreen** |  |  |  | | **Deodorant** |  |  |  |   III) Ask them to fill out the student worksheet at home and bring it in the class.   1. Collect the student worksheets and fill in the following tables. (you can also ask them to read their founding) |

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| Procedure | Sample class data collection sheets:   |  |  |  | | --- | --- | --- | | **Toxin by Number** | **Each entry is the number of times that toxin was found by an individual student** | **totals** | | **1** | **0, 2, 1, 0, 3, 2, 1, 1, 2, 1, 1, 0, 0, 0, 0,1,1,3,4, 2** | **26** | | **2** | **3,4,2,0,3,3,3,2,1,0,0,0,2,2,4,1,1,0,0,0,** | **31** | | **etc** |  |  |   Class Collection Sheet for Number of Ingredients Found:  Class collection Sheet for Number of each toxin found:   |  |  |  | | --- | --- | --- | | **Product** | **Student findings for number of toxic ingredients for each product**  **(each number is a different student’s record, be sure to record 0’s)** | **Class total** | | **lotion** | **3,1,0,3,2,2,1,1,3,2,4,0,0,3,6,1,0,2,3,0** | **37** | | **Hair product** | **2,2,2,4,3,1,0,0,0,2,4,2,1,3,2,2,4,5,2,1** | **42** | | **Body cleanser** | **0,1,2,1,3,1,0,0,0,3,2,1,3,2,1,0,1,1,3,1** | **26** | | **Etc.** | **Total** | **105** |     V) **You can make up probability problems like the following:**   * 1. If these were the lotions on the store shelf and I were to choose randomly from them, what is the probability that I would choose a hair product that has two or more toxic ingredients?   2. What would be the probability that I would choose a lotion with 3 or more toxins and a body cleanser with 2 or more toxins?   c. What is the probability that I would get a product that contains BHA-BHT? |

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| Time | 50 minutes in class |
| Assessment/evaluation or follow up | You can have the data collection sheets in the exam and ask similar probability questions. |
| Resources | http://www.beyondbenign.org/K12education/green\_math\_hs.html |
| Posted by/ person to contact | Shahrzad Latefi |