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| **Handouts:**   * Single and Doublestuf task | **Materials:**   * 8 packs of regular Oreos * 8 packs of Doublestuf Oreos * Triple Beam Balances * Rulers * Calipers * Graduated Cylinders * Plastic knives * Napkins |

**Objective**

Students will devise their own questions about single and double stuff Oreos and be able to distinguish between statistical and non-statistical questions. Students will determine how they will collect data to measure the stuf in an Oreo. Students will use the Nspire to record data and analyze data. Students will communicate their final conclusions to others, supporting their conclusion with statistical evidence.

**Questioning Portion (15 min):**

Ask students to think about single and Doublestuf Oreos. Ask students to write down questions they can ask about the cookies – give **3 minutes** to write questions.

1. *What questions can we ask regarding regular Oreo cookies and DoubleStuf Oreo cookies?*

Anticipated responses:

* Are the cookie portions the same between the two cookies?
* Is the stuf really double in the Doublestuf?
* Which is better?
* Which do people prefer?
* How many can I cram in my mouth?
* Do all pregnant women like Oreos?

Use the random name generator to call on students to share their questions – post on board (**2 minutes**). Be sure to write some non-statistical questions on the board.

Think-pair-share (**1 min, 2 min, 2 min**) - Ask students which of the questions on the board they would consider to be *statistical questions*, and why? Lead a discussion about statistical questions in the final 2min sharing portion. (Statistical questions are those that can be answered with data that varies … example of non-statistical questions are: How many can I cram in my mouth? and Which tastes the best? and Do all pregnant women like Oreos?).

Ask students the following question regarding questions on the board or new questions that come to mind. Ask students to focus on *statistical* questions here. Give students **3 minutes** to settle on questions.

1. *What questions can we answer today about Oreo cookies and DoubleStuf Oreo cookies?*

Anticipated responses:

* Answers will vary, but we will decide on studying “Is the stuf really double in the Doublestuf?”

Report out answers to #2. As a large group we will investigate today whether Doublestuf is really double (**3 minutes**).

**Data Collection Planning Portion (20 min)**

Once groups have decided on which question they will investigate, give them **5 minutes** to answer the following:

1. *To answer our question, what information will we need?*

Anticipated responses:

* Single or double?
* How much stuf? (Mass of stuf? / Volume of stuf?)

Each group should agree on the information we will need to get to answer our questions. Introduce the word VARIABLE for the specific questions we are asking each cookie. Also introduce the word DATA for the information we are collecting (the answers to those questions). Also introduce the term EXPERIMENTAL UNIT for a cookie. Note the different levels of questions we are asking (big statistical question vs. variable). This discussion should last no longer than **5 minutes**.

1. *How will we collect this information?*

Have each group determine how they will collect the data. They must decide how they will select the cookies to measure. Some groups will want to make only one data collection (i.e. take 30 single stuf cookies and 30 DoubleStuf cookies and compare the two measurements). Encourage students to think of how they can get data sets that may vary but would show the overall trend in the cookies. Steer students toward taking measurements from different cookies in the packs (30 if possible). (**10 minutes**)

**Data Analysis Planning Portion (10 minutes)**

1. *How might you use the collected information as a basis for answering your question?*

Some students may not have a clear vision for how they will analyze the data. Others will compare boxplots, compare means, or even do a t-test.

**STOP**. *Before you begin collecting data, clear your plan with one of the StaRT Team members.*

**Data Collection Portion (45 min)**

Have each group collect their data using triple beam balances, graduated cylinders, or rulers to measure the stuf.

**Data Analysis and Interpretation Portion (30 min)**

Ask class to answer the following question.

1. *What does your information tell you about the answer to your question? Use pictures, symbols, and/or words to clearly communicate and support your conclusions.*

Give students **10 minutes** to work. Circulate around the class and note different strategies groups are using. Anticipated strategies include comparing means, comparing boxplots, and doing t-tests.

Stop students from working (purposefully before they come to a final conclusion) and ask 2 or 3 groups to report out on the strategy they are using. After they report out, give students **15 minutes** to finish their analysis and interpretation.

Ask students to put their results on chart paper.

**Communicating Results (40 minutes)**

Have each group communicate their results using their chart paper and their Nspires in Presenter mode on the Navigator system.

**Total time: 2 hours 40 minutes = 15+20+10+45+30+40**