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| **Handouts:**   * Gum Task | **Materials:**   * Need 70 pieces each of: * Hubba Bubba * Bazooka * Extra (bubble gum flavored) * Bubble Yum * Triple Beam Balances * Rulers * Calipers * Stop Watches (phones?) * Napkins |

**Questioning Portion (20 min):**

Ask students to think about bubble gum. Show students the pile of gum we have. Ask students to write down questions they can ask about bubble gum – give **3 minutes** to write questions.

1. *What questions can we ask regarding bubble gum?*

Anticipated responses:

* Which gum tastes the best
* Which gum blows bigger bubbles
* Which gum’s flavor lasts longer
* Why does gum lose its flavor?
* What color is the gum?

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 tall am I? and Which gum tastes the best?).

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 bubble gum?*

Anticipated responses:

* Does Bubble Yum or Hubba Bubba blow bigger bubbles?
* Does Bazooka loose flavor sooner than Hubba Bubba?
* After chewing, does one brand loose more mass than another?

Report out answers to #2. As a large group decide on 2 to 4 questions to investigate today (**5 minutes**). Have each group associate themselves with one of the questions we have decided on.

**Data Collection Planning Portion (25 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:

* What brand of gum?
* Mass of gum?
* How large is the bubble (diameter?)
* How long until the flavor is gone?

For the 2 to 4 questions we are investigating as a class, have the class 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 piece of gum. Also introduce the word DATA for the information we are collecting (the answers to those questions). Also introduce the term EXPERIMENTAL UNIT for a piece of gum. Note the different levels of questions we are asking (big statistical question vs. variable). This discussion should last no longer than **10 minutes**.

1. *How will we collect this information?*

Agree as a class how we will use ourselves to collect the data. We may decide to use a paired design to reduce variability. We can also use random assignment to groups if everyone cannot be sampled twice (due to time constraints). Also, for measuring bubbles we may want each person to blow 3 bubbles and take the largest of the three tries (**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)**

As a class, collect data. Use the quickpoll feature of the Navigator system to quickly get responses and then push the collected responses back to the class.

**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 50 minutes = 20+25+10+45+30+40**