

Day of Data

Lesson Objectives



Intro/Complete M&M activity

60 minutes



Design a survey

45 minutes



Collect data

30 minutes



Analyze and visualize data

80 minutes



Present results/reflection

55 minutes

Student Learning Outcomes

- 1 Understand the data science process
- 2 Understand how data is useful and relevant to their lives
- 3 Be able to use Excel to analyze and visualize data
- 4 Be able to communicate results clearly

Materials

- 1 [Presentation for facilitators](#)
- 2 [Pre-survey/Post-survey](#)
- 3 [Fun survey](#)
- 4 [Sample student final presentation](#)



Intro

Upon entry, students fill out pre-survey with fun questions about their interests and favorites to generate a test dataset for the class (see: [Fun survey](#)). We will refer to this dataset throughout the class and use it to group students into project teams. (5 mins)

Introductions! Within table groups, suggest an icebreaker question, i.e. “What is a song you know all the words to?” Students and mentors share their names and answer the icebreaker question. (5 mins)

Start the discussion about the awesome power of data science using this [great video about Waze](#). Introduce the video and ask students what they know about Waze prior to watching. Once they know what the product does, ask them to hypothesize how it does it (with data). Take 1-2 responses, then start the video. If time, have students discuss in groups what surprised them about the video, and then share out to the class. (10 mins)

Walk students through the “data science process” that they will participate in (schedule for the day) and establish a mission/expectations for the day (5 mins)

Project the survey response data from the start of class to demonstrate how data science relates to everything in the world. Talk about the different types of questions that they could use in their own survey (5 mins)



M&M activity

Students will practice collecting and analyzing data themselves by counting the number of each color of M&Ms in a package and recording this on a collaborative Google sheet. Students follow along as instructors demonstrate how to create basic formulas and visualizations, focusing on aspects that will be especially critical to their own surveys and visualizations (30 mins). One small package of M&Ms per student or pair of students is recommended. [See our class results here for activity template](#).



Design a survey

Students break into groups based on topic identified in survey (4-5 students) with ~two high school mentors per group (5 mins).

Have each group decide on a team name and decorate a sign to showcase their spirit! (5 mins)

Discuss what makes a good research question. Present possible research questions that can be answered through data collection and analysis, and that can have cool visualizations. Consider: Is this topic of interest to me and others? Who are the audience and stakeholders? Is my question clear and focused? Is this question answerable with data I can collect? (5 mins)

Groups decide on a question (related to their topic) they are interested in. (10 mins)

Groups design a simple survey/Google form for Duke students. Mentors help create a [bit.ly link](#) for the survey to make it easier for Duke students to fill out. Things to consider: what is the best question format? What information do we need about our survey participants? If time: have students practice what they will say to ask people to fill out the survey. (20 mins)



Collect data

Students travel to a well-trafficked area on campus to survey college students. Students should bring a laptop or two with the survey already pulled up for participants to fill out, as well as several sheets of paper with the survey link clearly written down for participants to enter into their device. Survey links will also be passed along to GroupMe's and professors to share with their classes in order to increase the sample size. (30 mins)



Analyze and visualize data

Briefly review what makes a visualization effective. (10 mins)

Work in teams to conduct data analysis and visualization. Import data from Google forms to sheets. Students will create several charts/tables and determine what the most important takeaways are. They will also discuss results and conclusions from project and how to best to communicate results to stakeholders. Finally, they will make slides and presentation materials. If time, have each member of the group practice “pitching” the project and results. (70 mins)



Present results and reflection

Set up stations in other room. (5 mins)

Communicate results to college students and other key stakeholders through drop-in science fair-style event. (30 mins)

Reflection activity: Students discuss in teams (or journal, if time) and then share answers to the whole group, if comfortable:

- What was the most fun part of today?
- What are some things that you learned today?
- What was the most challenging part of the day?
- Is there anything you saw today that you want to learn more about in the future? (15 mins)

Students complete the post-survey and then we're done! (5 mins)