

## Introduction to the Data Science Process

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[Lesson Plan – Step 2 Organize Data](#)

[Lesson Plan – Step 3 Visualize Data](#)

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## Getting Started Tips for Teachers

### USING EXCEL IN THE CLASSROOM

- **Excel for the Web** (browser-based Excel app at [Excel.Office.com](https://www.office.com)) - We recommended this option for the Introduction to the Data Science Process to have the most consistent experience for your students.
- **Excel for Windows**
- **Excel for Mac**

### USING THE EXCEL WORKBOOK IN MICROSOFT TEAMS

Create an assignment (Introduction to the Data Science Process) in Microsoft Teams for Education and assign the Excel workbook to individual or small groups of students in a class. Groups turn in one copy of the assignment that can be graded separately or together. [Learn how here.](#)

### USING FLIP IN THE CLASSROOM

Flip is a free app from Microsoft where educators create safe, online groups for students to express their ideas asynchronously in short video, text, and audio messages. Promote peer-to-peer learning in your classroom while using the *Introduction to the Data Science Process* curriculum. [Learn how to get started here.](#)

We would love to hear your thoughts on the Introduction to the Data Science Process materials! Let us know what works well for you, what could be better, and what you'd like to see happen in the future. [Get in touch.](#)

## Introduction to the Data Science Process

### Lesson Plan – Step 1 Ask Questions

#### INTRODUCTION

In Step 1 of the DATA SCIENCE PROCESS, students will be asking questions. Their questions will be directly related to factors that impact the stability of a rocket as it travels through Earth's atmosphere. Students then narrow their focus to a single question that can be answered by investigating data.

#### LEARNING OBJECTIVES

- Brainstorm questions about factors that could impact rocket launch stability.
- Categorize visual, qualitative, and quantitative data related to a stable rocket launch.
- Develop a question that focuses on a specific data set.
- Determine what data will be needed to answer the focus question.

#### INSTRUCTIONS

1. Watch the *Introduction Video*.
2. Open the *Introduction to the Data Science Process* workbook and familiarize yourself with how to use it by reading the *Introduction* worksheet tab in the workbook.
3. Complete the guided steps in the workbook for each of the worksheet tabs prior to introducing the activity to your students.
4. Introduce the students to the lesson using the *Introduction* worksheet tab and the *Student Video*.
5. Instruct your students in locating and opening the Excel workbook. Remind students to [zoom out](#) in the worksheets to make sure they are seeing all of the page.
6. Be sure to use the *Excel Warm-Up* worksheet tab with students. Conduct a guided practice for *How to Use this Workbook* and *Excel Vocabulary* tasks with the dropdown. This will ensure greater student success with the subsequent activities.
7. Then show them how to navigate the workbook and earn their Data Science badges on the *Introduction* worksheet tab.
8. Show students these videos: [Introduction Video to Team Blue Origin](#) and [Blue Origin Scientist](#) to build background knowledge.
9. With guided or independent study, have students complete each of the lesson sections in the workbook. Student responses in Check Your Understanding will auto populate in the student journal and can be saved as a PDF and submitted for credit. Use these responses to initiate a class share out and discussion. The teacher may change the prompts for Question 4 in each activity by revising in the *Lesson Plan* worksheet tab of the workbook.

#### STANDARDS

- **NGSS MS-ESS1-3.** Analyze and interpret data to determine similarities and differences in findings.
- **ISTE 5b.** Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- **CSTA 2-DA-09** Collect data using computational tools and transform the data to make it more useful and reliable.

#### LEARNING EXTENSIONS

Visit the lesson webpage at <https://aka.ms/ITDS> for learning extensions, including videos, career corner, reflections in Flip, and mini activities like sending a postcard into space.

## Introduction to the Data Science Process

### Lesson Plan – Step 2 Organize Data

#### INTRODUCTION

The next step in the data science process is to organize data. Collected sets of data can be extremely large. In your role as a data scientist, you must make the data manageable by using the power of digital tools to better understand the impact of wind on our rocket launch.

#### LEARNING OBJECTIVES

- Type, copy, and paste data in Excel cells
- Read sensor data, and manipulate columns of data
- Organize data into a structured table
- Calculate data with formulas in a table

#### INSTRUCTIONS

1. Open the *Introduction to the Data Science Process* workbook and familiarize yourself with the lesson activities.
2. Complete the guided steps in the workbook for each of the worksheet tabs prior to introducing the activity to your students.
3. Show students these videos [Blue Origin Video Stories](#) and [Blue Origin Scientist](#) to build background knowledge.
4. Instruct your students in locating and opening the Excel workbook.
5. With guided or independent study, have students complete each of the lesson sections in the workbook. Student responses in Check Your Understanding will auto populate in the student journal and can be saved as a PDF and submitted for credit. Use these responses to initiate a class share out and discussion. The teacher may change the prompts for Question 4 in each activity by revising in the *Lesson Plan* worksheet tab of the workbook.

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#### LEARNING EXTENSIONS

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- Extra practice with Excel: use the Optional-Excel Learning and Skills Practice section found at the bottom of the Stage two activities or in the *Optional Excel Learning & Skills Practice* workbook.

## Introduction to the Data Science Process

### Lesson Plan – Step 3 Visualize Data

#### INTRODUCTION

Step 3 in this data science process is the creation of visual interpretations of our data. You know these as charts and graphs. They allow data scientists to see the data in ways that numbers and text just can't provide. Your task is to use our organized data from Step 2 and create a chart showing our maximum allowable wind speeds at different elevations.

#### LEARNING OBJECTIVES

- Visualize data with column and scatter charts
- Use the Analyze Data feature and learn how to move and resize chart
- Locate different charts from the Insert menu
- Edit titles and labels in a chart

#### INSTRUCTIONS

1. Open the *Introduction to the Data Science Process* workbook and familiarize yourself with the lesson activities.
2. Complete the guided steps in the workbook for each of the worksheets prior to introducing the activity to your students.
3. Show students these videos [New Shepard Human Flight History](#) and [Blue Origin Scientist](#) to build background knowledge.
4. Instruct your students in locating and opening the Excel workbook.
5. With guided or independent study, have students complete each of the lesson sections in the workbook. Student responses in Check Your Understanding will auto populate in the student journal and can be saved as a PDF and submitted for credit. Use these responses to initiate a class share out and discussion. The teacher may change the prompts for Question 4 in each activity by revising in the *Lesson Plan* worksheet tab of the workbook.

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## Introduction to the Data Science Process

### Lesson Plan – Step 4 Interpret Data

#### INTRODUCTION

In STEP 4 of the DATA SCIENCE PROCESS, your team will interpret the visualized data from Step 3 to make a Go/No-Go determination for a rocket launch. Your team will report their findings in a brief report to flight control.

#### LEARNING OBJECTIVES

- Learn about visualizing with two types of charts
- Examine a windspeed data chart from a weather balloon
- Use the data available to determine whether the rocket flight will be a Go/No-Go for launch

#### INSTRUCTIONS

1. Open the *Introduction to the Data Science Process workbook* and familiarize yourself with the lesson activities. In Activity 4.3 students will decide on a Go/No-Go for launch. Build excitement and engagement for this activity and the decision they are about to make!
2. Complete the guided steps in the workbook for each of the worksheets prior to introducing the activity to your students.
3. Show students these videos [To Space and Back with NS 21 Crew](#) and [Blue Origin Scientist](#) to build background knowledge.
4. Instruct your students in locating and opening the Excel workbook.
5. With guided or independent study, have students complete each of the lesson sections in the workbook. Student responses in Check Your Understanding will auto populate in the student journal and can be saved as a PDF and submitted for credit. Use these responses to initiate a class share out and discussion. The teacher may change the prompts for Question 4 in each activity by revising in the *Lesson Plan* worksheet tab of the workbook.

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