

Understanding Data

While topics regarding data may not fit specific SOLs for a given course, understanding data (finding/collecting data, analyzing data, and using data to make predictions or draw conclusions) is a crucial life skill for all students. The following activities should take one class period (or a portion thereof) so that more teachers on a team can participate in the Building Tomorrow projects without causing too much disruption to their pacing guides.

The most appropriate courses for these activities would be math, science, and social studies. Math teachers can help students find rate of change and use data to make predictions. Science teachers can help students understand data and how it relates to scientific principles and to make recommendations for the future. Social Studies teachers can use data to help students understand historical trends, current events, and economics.

Teachers can choose one or more of the following activities to use with students. Teachers should guide the students through the steps, acting as a facilitator, but letting students take the lead on the projects themselves. Therefore, students can be working independently on different projects.

It is recommended that before using any of these projects, teachers survey students beforehand to see what projects they are working on. Then, teachers can provide specific examples based on some of the projects, and can put students in brainstorming groups based on similar projects.

Teachers can Make a Copy of this form to use with students, but should remove the directions or activities they do not intend to use before doing so.

Phase 1 Research Activities

Activity 1.1: Asking Questions

Required time: Approximately 5-10 minutes per student in groups of 2-4 students.

What questions can be asked to determine the significance of the problem or topic being studied? Add one question below per box.

Note: Students can brainstorm in small groups even if they are working on different projects.

Activity 1.2: Reviewing Current Data

Required time: Approximately 45 minutes. The teacher should show students how to find and cite current and relevant data, then how to write a summary of the data, then how to draw inferences or make predictions based on the data. It is suggested that the teacher find out what topics students are working on ahead of time and provide potential resources or work with the school library media specialist to help provide potential resources.

What data has already been collected about this problem or topic? Fill out one or more of the tables below.

Source	What the Data Says	What the Data Means

Phase 2: Planning Activities

Activity 2.1: Planning to Collect Data

Required time: 10 minutes to lay out the assignment and do a whole group lesson on data collection; 30-45 minutes to have students work together to brainstorm how to collect appropriate data. NOTE: Students do NOT need to be working on the same project to brainstorm with one another.

Determine what data you will collect for your project. How will the data be measured (i.e., what tool(s) will you use)?

For projects that involve creating goods or physical objects, physical tools will often be used. They may include tools like those found [here](#). If you are building or creating a physical object, you will want to research the tools used in your industry and choose ones that are appropriate for your project.

For projects that require working with people, other measurements will be used. These might include surveys, website statistics, number of tickets sold, interviews, rating scales, and more.

Remember, you are looking to measure the **IMPACT** that your project has on the community beyond your own high school. Brainstorm how you will **MEASURE** that impact. You may decide to collect more than one measure.

What we want to measure / Data to collect	Tool used for measurement

Phase 3: Implementation Activities

Activity 3.1: Analyzing Data for Action Purposes

Required time: 10 minutes for a whole group lesson on making changes with current data; 30-45 minutes for students to review their current data in small groups and brainstorm next steps. NOTE: Students DO NOT need to be in the same group to review their current data and determine next steps.

Look at your current data. Is it surprising? What changes might you need to make based on the data?

Current Data	Implication	Potential Next Steps Based on this Data

Phase 4: Reflection Activities

Activity 4.1: Analyzing Data to Draw Conclusions

Required time: Approximately 45 minutes. Show students how to use the data that they collected, then how to write a summary of the data, then how to draw inferences and make conclusions based on the data. NOTE: NOTE: Students DO NOT need to be in the same group to review their current data and determine next steps.

Source	What the Data Says	What the Data Means

Activity 4.2: Representing Data

Required time: Approximately 45 minutes. Students should review the different ways to show their data and then create the chart or graph that best represents their data. NOTE: Contact your school's Digital Learning Specialist if you would like to have them co- or model-teach a lesson on creating charts and graphs in Google Sheets.

[Review these different types of graphs.](#) For the types of data that you have and the message you are trying to share with people, which type of graph makes the most sense?

Use [these directions](#) to create graphs or charts in Google Sheets.