

# Increase your broader impacts and student quantitative reasoning with Data Nuggets

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## Introduction

### DATA Nuggets

(<http://datanuggets.org>) are an innovative approach to bring contemporary research and authentic data into the

**classroom.** Each activity is written by the scientist behind the research and includes a dataset that students visualize, interpret, and use to support evidence based claims. Because of their simplicity and flexibility, Data Nuggets can be used throughout the school year, and across grades K-16, as students develop their quantitative abilities. Data Nuggets' goal is to engage students in the practices of science by combining content with key concepts in quantitative reasoning. They help students understand how scientists create and modify scientific knowledge, while developing their quantitative skills and helping them function as critical thinkers in modern society. Data Nuggets have been under development since 2011 and originated through collaboration between teachers and scientists.



## Data Nuggets in the Classroom

Data Nuggets are currently used in hundreds of K-16 classrooms across the country. In the past year, the Data Nugget website has been visited by over 16,000 unique users from all 50 states.

Teachers have shared with us that when they use Data Nuggets in their classrooms, students demonstrate increased engagement in class and interest in science. In addition, students are more comfortable working with "messy data" that results from true scientific investigations, and are better able to generate their own questions and research projects. Many Data Nuggets are written by young, early career scientists. Because each Data Nugget shares the story and images of the researcher at work, teachers share that students' perceptions of scientists change, and they are more likely to see themselves as scientists when they conduct their own investigations. Students are surprised to see that so many scientists are women, and that not all science is conducted in the lab. Data Nuggets reflect the true process of science, which helps dispel misconceptions that science is linear, most of the big questions have already been answered, and when done correctly data supports hypotheses.

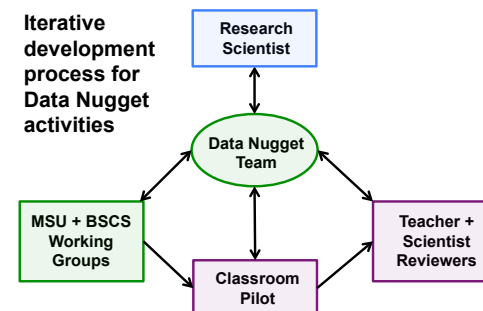
## Making a Data Nugget

**Data Nuggets allow scientists to share their authentic research broadly, improving the understanding of science in society.** Ecologists recognize that sharing research findings with the public is crucial for developing strong broader impact programs, yet can be difficult and time consuming to enact. When creating a Data Nugget, you must dig deep to uncover the core messages of your research and think back to the big question that originally inspired your passion for research. As an added benefit, once you are able to communicate your research to a 6th grader, you can rest assured that at your next conference you'll be better able to discuss your work with colleagues and collaborators outside your field!

By sharing your story and how you became passionate about science, you have the opportunity to **inspire the next generation of scientists and researchers.** Providing students with a direct connection to scientists and cutting-edge research has the added benefit of capturing the attention of students by engaging them with more than just the conclusions of a study, but the story and process of the researcher behind the ideas and data.

We work with you along every step of the way, and have fine tuned the experience through the creation of over 60 Data Nuggets. We have a detailed template available on our website to help you get started. Once your Data Nugget is complete, it is hosted on our website and goes through an iterative piloting and revision process where we solicit feedback from teachers, students, and scientists.

Iterative development process for Data Nugget activities



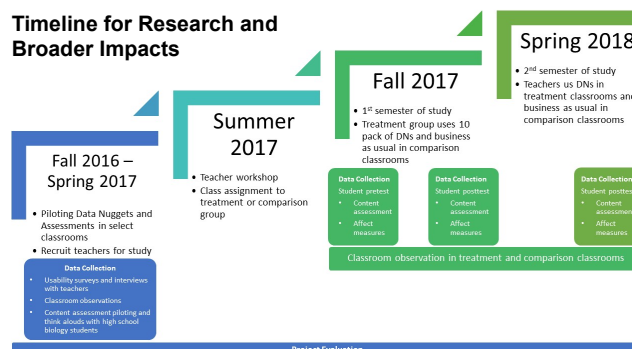
## Research Study



Data Nuggets **require a relatively small commitment from teachers and students, yet can potentially have a large impact on student thinking, specifically around quantitative reasoning in the context of science.** To assess the efficacy of Data Nuggets we are conducting a fully randomized experimental trial in 30 high school biology classrooms in Michigan, Colorado, California, and Illinois. Treatment assignment is at the classroom level. The study will take place in the 2017-2018 school year. The evidence from the efficacy study will demonstrate whether short, targeted interventions of classroom activities embedded within a typical curriculum can impact student outcomes.

## Study Timeline

### Timeline for Research and Broader Impacts



## Predictions

We predict students using Data Nuggets will demonstrate

1. improved quantitative reasoning abilities in context
2. increased understanding of the practices of science
3. greater engagement in the classroom
4. greater motivation for, and interest in science.

### Acknowledgements

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