Guided by the Next Generation Science Standards (NGSS), Inquiry Hub High School Biology embeds citizen science into curriculum. Using research-based approaches to teaching science along with software and digital tools, students contribute resources, observations, data, and analyses to solve larger scientific problems.

Inquiry Hub Biology is designed to go beyond traditional science content. By focusing on phenomena relevant to students’ lives and communities, Inquiry Hub Biology provides opportunities to authentically engage with science and engineering practices. The combination of citizen science, technology, and a focus on science and engineering practices has been shown to help students feel more like scientists, including the belief that their ability to do science can make a difference in their world (Bang & Medin, 2010; Calabrese Barton & Tan, 2010; Roth & Lee, 2003; Shutt, Vye, & Bransford, 2011; Tzou & Bell, 2010).

Inquiry Hub also impacts teachers and the systems in which they work. Teachers participating in the co-design of units and lessons gain a rich knowledge of the Next Generation Science Standards and the teaching practices needed to implement them. Teachers who use the materials see first-hand the key shifts called for by the NGSS, such as the focus on scientific practices and a move away from “trust me” science.

Who We Are

Inquiry Hub is a design research partnership started in 2008 that brings together researchers from the University of Colorado Boulder, STEM curriculum leaders and teachers from Denver Public Schools, and web engineers and digital content curators from the University Corporation for Atmospheric Research. See more about Inquiry Hub at http://inquiryhub.dls.ucar.edu.
Curriculum units in Inquiry Hub Biology are organized around the Disciplinary Core Ideas described in the Next Generation Science Standards. In each unit, students focus on relevant phenomena while taking on a challenge involving citizen science and/or engineering practices.

### Ecosystems

The Ecosystems unit has gone through two cycles of design and testing and features a number of custom-built tools to help students understand Denver's urban ecosystem. One such tool is EcoSurvey, which students use to collect data about organisms and abiotic factors in their local environment and to understand how they are connected. Using this analysis and knowledge of such things as urban heat islands, biodiversity, invasive species resistance, and soil quality, students choose and plant a tree that will support the local ecosystem. Using data collected from pilot testing, the Ecosystems unit will be refined and made publicly available for 2016-2017.

### Evolution

The Evolution unit engages students in a study of three distinctly different phenomena: the rapid evolution of antibacterial-resistant bacteria, the evolution of juncos, a bird species known for its very recent adaptation to urban environments, and the evolution of hominids. As a citizen science challenge, students work to create infographics for their school or community health centers that communicate the risks of misusing antibacterial agents and prescription antibiotics. Following the initial cycle of design and testing during the 2015-2016 school year, the Evolution unit will be revised in 2016 and undergo another round of testing during the 2016-2017 school year.

### Genetics

A Genetics unit will be the focus of co-design during Summer 2016 with pilot testing to follow during the 2016-2017 school year.

### Structure and Function

Future Inquiry Hub curriculum work will likely include a focus on the structure and functions of organisms, including the understanding of biology at the cellular level.

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