

Dragons Fly Higher

with New Projects

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Dragons have been breeding on servers and in classrooms worldwide for many years at the hands of students using our Geniverse software to learn about genetics. Now they're multiplying—and migrating to new topics and grade levels—thanks to two new projects funded by the National Science Foundation.

Geniverse is free, web-based software for high school biology that engages students in exploring heredity and genetics by breeding and studying virtual dragons. By programming the mechanisms that govern real-world genetics into a virtual environment, this game-like software circumvents traditional classroom obstacles of time and space and provides a means for experimentation that closely mimics real-world genetics. Two new projects will build upon this strong foundation, bringing it to new learning settings and enhancing its use within technology-rich classrooms.



Students track their own progress and navigate to each Geniverse activity through the Case Log.

GeniConnect: Afterschool biotechnology learning and mentoring

The three-year GeniConnect project will use Geniverse to help connect underserved students with local biotechnology professionals. By deepening its gaming aspects and revising content to more fully target middle school biology, we plan to extend Geniverse into the afterschool environment at East End House, a community center in East Cambridge, Massachusetts.

Local professionals will mentor students, playing Geniverse with them and exploring biotechnology and its impacts on everyday life while also helping to broaden students' views of future career options to include science. With researchers from Purdue University, we'll explore how an immersive game and a connection to a real scientist can increase student interest in and learning of science. In addition to creating connections between students and mentors, we will build and characterize robust networks between biotech firms and the community center to produce a toolkit for STEM industries to foster successful partnerships with community centers and afterschool programs nationwide.

GeniGUIDE: Providing intelligent guidance for teachers and students

As students engage with next-generation digital curricula on individual laptops, teachers often find themselves in the position of knowing less about their students' learning or struggles on a daily basis. A four-year collaboration with North Carolina State University will pair Geniverse with robust intelligent tutoring systems (ITS) to provide real-time classroom support.

GeniGUIDE—Guiding Understanding via Information from Digital Environments—will offer automatic support for students' common problems and stumbling blocks, leveraging the strengths of ITS to relieve teachers of the burden of answering commonly repeated questions and problems. At the classroom level, it will continually monitor student learning and progress, and make use of this capability to

connect learners. When it identifies a student in need of assistance that transcends basic feedback, the system will connect the student with other peers in the classroom who have recently completed similar challenges, thus cultivating a supportive environment.

At the highest level, the software will leverage the rich data being collected about student actions and the system's evolving models of student learning to become a valuable real-time resource for teachers. GeniGUIDE will identify students most in need of help at any given time and provide alerts to the teacher. The alerts will include contextual guidance about students' past difficulties and most recent attempts as well as suggestions for pedagogical strategies most likely to aid individual students as they move forward. Project research will contribute to understanding how data streams from deeply digital learning tools can be useful in furthering student content understanding.

We're excited to welcome veteran teachers who have followed dragon genetics tales (and tails) for many years in BioLogica or GenScope, as well as our newest Geniverse teachers and students.

Studying dragons is a great way to teach genetics!



LINKS

Geniverse
<http://concord.org/geniverse>

GeniConnect
<http://concord.org/geniconnect>

GeniGUIDE
<http://concord.org/geniguide>