

HHMI BioInteractive (<https://www.biointeractive.org>; Howard Hughes Medical Institute, 2019)

In 2018, the Howard Hughes Medical Institute BioInteractive (HHMI BioInteractive) website was honored by the American Association of School Librarians as one of the best sites for librarians and their collaborators, because this creative, innovative, free, and user-friendly website encourages the development of a community of learners. This review discusses some recent improvements to the website.

The recent updates to HHMI BioInteractive's more than 650 pages, which took about one year to complete, include a more condensed, uniform format with the same tone and elements presented on each page. The newly reconfigured and streamlined site is a virtual wonderland for biology teachers, containing videos old and new, lesson time suggestions, interviews with scientists, case studies, blogs, virtual labs, interactive quizzes, links to the literature, learning outcomes, NGSS links, professional development, and a plethora of other educational opportunities, all evidence-based, selectable, and education-level specific.

The site now allows for annotation and tweaking of web-based activities that can be saved for future reference. Teachers can also modify their lesson or activity sequence on the website and save it as a "playlist," e-mail it to colleagues, "favorite" it, and use it when needed. Some of the new features (e.g., playlist, favorites) require a free user account for access. If learning how to use the redesigned site sounds like a big time commitment, HHMI BioInteractive also gives regional

workshops with suggestions for using their website based on specific needs, or you can ask your school district to contact HHMI BioInteractive to organize one.

Besides providing "one-stop shopping" for classroom media needs at every educational level, the site also offers another exciting feature: web-based professional development courses for teachers. For example, a course on evolution is designed to help teachers deepen their content knowledge, particularly content required to teach evolution at the high school level. As a reward for completing either one or all three units (about 10 hours total) with a grade of 85% or higher, either one certificate (for only the first unit) or two certificates (for all three) will be addressed to your school district administrator and signed by the HHMI BioInteractive Team. The first unit enables a teacher to address questions about biodiversity, such as "How did all these different organisms arise?" and "What mechanisms or processes cause the differences we see among species?" Units 2 and 3 introduce the evidence supporting evolutionary theory (fossils, anatomy, biochemistry, genetics, and cell biology) and instruct teachers in how biologists define species, use evidence to back up claims about the patterns of relationships among organisms, and explore the major macroevolutionary changes in Earth's history. For obvious reasons, enrollment is required.

Most of the new features have been translated into Spanish. Newer resources for use with assisted technologies are also available, and audio descriptions are provided for vision-impaired students. There is also an improved keyword search feature, making it easier to find resources on each page, and

synopses of videos are provided for student review.

On each page, clickable headers appear: "Classroom Resources," "Planning Tools," "Professional Learning," and "About Us." Classroom resources can be filtered by topic, resource type, level (High School General or AP/IB, or 2- or 4-Year College), and curriculum standards. For example, plugging "Ebola" into Classroom Resources as a search term and requesting "Interactive Media," provides "Virus Explorer," a desktop app for Windows or Mac, to install on the computer. It allows the student to measure and compare the sizes of different viruses in relation to a human cell. This app also showcases three-dimensional models of nine viruses: rabies, influenza, HIV, Ebola, tobacco mosaic virus, adenovirus, bacteriophage T7, papillomavirus, and Zika. Students can click on the models to rotate them, view them from different angles, and display each of them in cross section.

There are so many resources available on the HHMI BioInteractive site, a teacher could spend their entire summer combing through them. Regardless of whether a teacher is investigating genetics, anatomy and physiology, evolution, environmental sciences, microbiology, or ecology, the HHMI BioInteractive has an appropriate activity. This incredible site keeps every teacher in mind by providing a well-considered set of evidence-based learning activities.

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