**SPORE® SERIES WINNER**

**Bringing the Museum into the Classroom**

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Field trips to science institutions offer an opportunity for teachers to spark student interest and to supplement their classroom teaching with vivid experiences of science and nature. At the American Museum of Natural History (AMNH) in New York City, education is central to our mission, and all content is developed to support learning. Museum exhibition and education staff produce media-rich content that is scientifically authoritative, thanks to collaboration with members of the museum’s research staff of more than 200 active scientists. Digital technology opens new avenues to bring these resources into the classroom to extend a class field trip or to bring the museum to classrooms outside the New York City region.

Research shows that when science teaching engages students in authentic scientific inquiry, it improves their understanding of both content and process (1, 2). Effective science teachers supplement their curricula with stimulating scientific content resources that inspire students’ personal connection (see the first figure). When teachers bring museum resources into the classroom, students’ engagement in the content and the practices of science increases (3). Supplements help teachers adapt their teaching to students’ cultures, interests, and capabilities, which vary from district to district and classroom to classroom (4, 5). These factors inspired Resources for Learning (RFL), a free, online catalog of the AMNH’s science education materials (6).

We designed RFL to make the museum’s science content accessible to all teachers. This includes subject matter derived from the museum’s permanent exhibitions, as well as a growing body of materials produced directly for online use and dissemination. In addition, AMNH produces several new special exhibitions every year. All exhibitions have an online presence accessible through RFL.

About 10 years ago, AMNH began to produce science content specifically for an online audience. The museum’s Science Bulletins program produces short video documentaries and visualizations for display in our permanent exhibition halls, for distribution to 30 institutional subscribers around the world, and for free distribution on the Web. Science Bulletins stories report on current scientific research in astrophysics, Earth sciences, biodiversity, and evolution. OLogy, the museum’s Web site for kids, is updated with new content to 30 institutional subscribers around the world, and for free distribution on the Web.

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Exhibitions extend to the Web. Content developed for exhibition halls—such as this interactive comparison of chimpanzee, Neanderthal, and human skeletons—is adapted for Web access and cataloged in Resources for Learning.

A middle-school teacher in New Jersey, “The resources of the AMNH seem endless, with unlimited virtual access,” said a teacher from a New York City high school. They have also indicated an interest in accessing lessons that connect to these resources and that have been implemented in classrooms by their colleagues. This information is influencing the museum’s digital content strategy, which aims to provide teachers tools (such as a new lesson-planning tool for selecting and organizing online resources) for use in their classrooms and to share with other teachers.

Our content model enabled a partnership with MacMillan McGraw-Hill, which publishes kindergarten to sixth grade (K–6) science textbooks used in classrooms nationwide. We used RFL to create special collections of AMNH resources correlated to the key topics and learning goals of each chapter in the textbook series, offering teachers around the country additional ways to connect the textbook material to the interests of students in their classroom. Our model has also fostered new partnerships by making it easy to share with and contribute to similar repositories, such as National Science Digital Library (NSDL), Digital Library for Earth System Education (DLESE), and Science and Math Informal Educators pathway (SMILE).

Demonstrating the value of modular content and robust metadata are another way that RFL continues to inform the museum’s overall digital content strategy. The museum recently launched a new mobile application, the AMNH Explorer, which helps visitors on site in the museum find their way through exhibition halls and allows them to bookmark exhibition objects for further exploration online. Our education department is working with local teachers to consider how the next version of Explorer might enhance their teaching at the museum and in the classroom. These teachers express a clear desire to be active users of the device, to plan field trips around the topics they are teaching, and to incorporate related content, like Science Bulletins, into their plans. The museum is also redesigning its Web site with a new strategy that will represent both exhibition-based and created digital files as reusable, modular content with thorough metadata, so that the new capabilities these teachers ask for can be developed on any digital platform.

The future of science museums embraces both kinds of experiences: the irreplaceable impact of directly encountering physical evidence on site, and the ready access to an enormous library of authentic scientific content by means of many digital platforms. The goal is a continuous presence for the museum’s content that extends into the classroom as a ready resource for effective science teaching.