To the extent possible under law, the Smithsonian Center for Education and Museum Studies has waived all copyright and related or neighboring rights to Digital Learning Resources Project, Volume 2: Environmental Scan. This work is published from: United States.
Abstract

To gain insight into the current trends in digital learning, an Environmental Scan was conducted as part of the DLRP. A list of 32 websites for review was culled from recommendations of the SCEMS staff, Cross & Jofitus, and Navigation North contractors to provide a broad spectrum of sites to which K-12 teachers are exposed and which are attracting particular attention. We organize these sites into three categories: 1) Museum Education Sites, 2) General Education Resource Sites, and 3) Digital Collection sites. The collections sites were chosen as a useful comparison to the large museum digital repositories operating in the same space as the Smithsonian Collections site http://collections.si.edu/search/index.htm. The education and museum websites were chosen on the basis of survey data from DLRP Teacher Research Group members, as well as for their potential to offer models of best practices that could be replicated.

Reviewers found that while museum sites are continuing to make credible advancements in developing and deploying tools that allow educators the means to independently save and distribute educational content, few provide open learning resources and curriculum elements that can be shared easily within and across different websites. Museum sites still serve as a primary publishing point for curriculum collections and materials as generated by centralized, internal teams, and those materials are largely deemed effective and comprehensive across educator audiences.

The general education resource sites differ in their approach to audience. Where the reviewed museum sites tend to be focused on the teacher-user, the education sites were designed with a broader audience in mind, an audience that includes the student and sometimes parents. Museums are beginning to offer these features as well, but their perspective on the identity of the audience still focuses largely on the teacher as the main user and interpreter of content.

The digital collection sites offer the deepest and most expansive digital collections. These sites contain thousands of resources (primary, audio, visual, text, etc.) that have been curated from numerous individual collections. Many of the sources are other museums, databases, archive collections, national libraries, and users (i.e., archive.org).

Examples of best practices are described in the categories of: Authoring and Lesson Building Tools; Online Exhibitions; Creating Instructional Portals and Student Accessibility; Ease of Navigation and Search Features; and Numerous Contributors and Partners.

Finally, a look at where the SCEMS site sits within this environment found that SCEMS is in a unique position. This is because of its extensive access to large stores of exceptional native resources as part of the Smithsonian family and its freedom from having to define its proximity to these resources as third-party aggregator. Through the strategic development of certain tools and features, SCEMS could best use this proximity by making continued use of its content development and expertise and by combining these with educator-enabled assimilation and sharing utilities to bridge many of the gaps inherent in other resource-provider solutions.
Project Team

PROJECT DIRECTORS
Smithsonian Center for Education Museum Studies
Darren Milligan, Senior Media Designer/Webmaster
Michelle Smith, Director of Digital Media and Publications

Navigation North Learning Solutions, LLC
Joe Hobson, Director/Owner
Brian Ausland, Director of Educational Research and Strategic Initiatives

Cross & Joftus, LLC
Christopher Cross, Chairman
Virginia Adams Simon, Senior Associate

PROJECT TEAM
Smithsonian Center for Education Museum Studies
Pino Monaco, Director of Program Evaluation and Audience Research
Melissa Wadman, Manager of Program Evaluation

Navigation North Learning Solutions, LLC
Daniel Kriger, Engineer
MaryRose Lovgren, Education Consultant

Cross & Joftus, LLC
John Ittelson, Professor Emeritus, California State University, Monterey Bay
Clark Quinn, Executive Director, Quinnovation
Dilan Maherdran, Post-Doctoral Candidate, University of California, Berkeley
Virginia McMunn, Teacher/Consultant
Griffith Montgomery, Education Specialist
Jillian Ryan, Teacher/Consultant

The Digital Learning Resources Project is funded by a Smithsonian Youth Access Grant administered by the Office of the Assistant Secretary for Education and Outreach, with contributions by the Pearson Foundation, Brokers of Expertise of the California Department of Education, and the Council of Chief State School Officers. This document is the second of five parts. For all of the project documents, please visit the Digital Learning Resources Project wiki at http://smithsonian-digital-learning.wikispaces.com/. The Digital Learning Resources Project wiki is designed to involve internal and external stakeholders, experts, and educators everywhere in the development of this project; provide a transparent, fast, and durable medium for project development and refinement; and to demonstrate the potential of an open, public process.
Table of Contents

Background ........................................................................................................................................... 5
   Environmental Scan............................................................................................................................ 5
   Methodology ......................................................................................................................................... 6
   Sites Reviewed .................................................................................................................................... 8

Findings .................................................................................................................................................. 9
   Findings Within Categories ............................................................................................................... 14
   Museum Sites ..................................................................................................................................... 15
   General Education Sites ................................................................................................................... 16
   Digital Collection Sites .................................................................................................................... 16

Review of Best Practices ....................................................................................................................... 17
   Positioning SCEMS in the Field......................................................................................................... 22
   Conclusion and Recommendations ................................................................................................... 23

Appendix A ............................................................................................................................................ 24
Appendix B ............................................................................................................................................ 45
Appendix C ............................................................................................................................................ 48

Appendix D (attached): Site Feature Charts
Smithsonian Center for Education and Museum Studies
Environmental Scan

Background

The Smithsonian Institution is the world’s largest museum and research complex, with vast collections and expertise in history, science, the arts and culture. Its expanding digital presence represents its commitment to broadening access to people everywhere. Focusing on digital outreach to educators and students, the Smithsonian Center for Education and Museum Studies (SCEMS) launched www.smithsonianeducation.org, whose main feature is an indexed collection of learning resources that are aligned to all state, national, and now, Common Core standards of learning. The site’s 2,000 record-collection of resources such as lesson plans, video and audio clips, and interactive instructional games is one of several Smithsonian finding tools such as its Collections Search Center (7.89 million catalogue records, 779,100 images). Other Smithsonian websites also offer digital collections and tools in specific subjects and collections; the Center’s unique goal among Smithsonian websites is to provide access to all Smithsonian resources that are relevant for classroom learning in the most useful and relevant ways. The impetus for the Digital Learning Resources Project was to help the organization better understand educational uses of Smithsonian digital resources and provide a roadmap for future digital development. The specific research objectives focus on educators’ ability to identify, analyze, and extract digital content, with the ultimate goal of enabling all users to achieve their own personal learning objectives through the Smithsonian’s resources.

Environmental Scan

An Environmental Scan is a review of the landscape of a particular product or discipline, typically conducted when organizations are evaluating their position in a field or marketplace or want to gain a better understanding of current best practices. This was true in the case of the DLRP. In addition, researchers hoped that their review of other sites might answer further questions about the types of digital toolsets teachers are using that might serve as proxies for eventual prototypes. The focus of this review and analysis will discuss some of the more popular museum-related resource sites and the steps they’ve taken to promote discoverability through established taxonomies like instructional subject lists or content standards, user-directed organization of content for presentation to students, and, finally, development of instructional items and interactive components that promote learning.

Given that the user analytics—previous research and review of the literature (detailed in Volume I)—offered a clear consensus on the type of navigational features and digital assets teachers were seeking, the flexibility required for using those assets in the classroom, and what trends to look for, the aims of the environmental scan became focused on investigating who, if anyone, was offering those experiences and assets. What sites are offering the appropriate filters and high-quality tools for finding, adapting, annotating, saving, and sharing these resources? How does smithsonianeducation.org measure up against these sites, both in the museum world and the general education field? What opportunities exist for SCEMS to fill existing gaps in this arena and become a leader the field of digital learning resources?
To gain some insight into the current trends in digital learning, an Environmental Scan was conducted as part of the DLRP. A list of 32 websites for review was culled from recommendations of the SCEMS staff, Cross & Joftus, and Navigation North contractors to provide a broad spectrum of sites to which K-12 teachers are exposed and which are attracting particular attention. This is not a comprehensive list of all museum education sites, but rather a representative sample. We organize these sites into three categories: 1) Museum Education Sites, 2) General Education Resource Sites, and 3) Digital Collection Sites. The collections sites were chosen as a useful comparison to the large museum digital repositories operating in the same space as the Smithsonian Collections site [http://collections.si.edu/search/index.htm]. The education and museum websites were chosen on the basis of survey data from DLRP Teacher Research Group members as well as for their potential to offer models of best practices that could be replicated.

We began with the SCEMS site ([http://smithsonianeducation.org](http://smithsonianeducation.org)) as a central point of comparison. As an intentional part of its main construct, this site provides teachers with comprehensive instructional plans, PDFs of central and supplemental materials, and fully integrated primary source documents that can be immediately used as part of classroom instruction. Resource searches can be queried against subject and grade designations as well as in relation to both state and Common Core content standards. Users are provided a means to annotate by way of submitting a review of the resources for publishing as part of the ongoing metadata package. There are sharing buttons available as well (Facebook recommendation and a “ShareThis” button) and each pre-constructed plan comes with an introduction and a description of how to best use the resource within the classroom. Teachers are not provided any tools to document or expose the methods or means by which they “ready” or “further enable” the lesson materials or resources for their students. As research illuminates strong tendencies that trend towards teachers’ regularly modifying and combining materials to create greater accessibility for more students, those instructional manipulations go formally undocumented in the current environment. The presentation structure of the resources is strongly guided through a linear, narrative sequence, which does provide a substantially clear, albeit singular method of implementation. Where and how teachers might modify or re-sequence the delivery or parse it with additional supplements goes undocumented in its current state.

**Methodology**

Listening to the voice of the teacher has been paramount in the design of each step of the SCEMS Digital Learning evaluation process. Without this voice, the findings of such studies risk becoming more academic than relevant. Therefore, in order to answer the central questions of the scan, the SCEMS research team drew on the perspectives of three teachers who regularly access and use digital resources in their classrooms. Viewing the field through their eyes provided the team with valuable insight into the landscape of digital learning resources. Each teacher brings a unique perspective on teacher preferences as well as their experiences when they identify, analyze, and extract digital resources for the classroom.

In addition, Brian Ausland, lead technology consultant with Navigation North Learning Solutions, analyzed the reviews from a marketplace perspective based on his extensive
experience working as a developer of digital resource repositories over the last 15 years. (See pg. 23, Positioning SCEMS in the Field.)

Review Criteria

The teacher reviewers took a direct, timed approach to search for resources focused on a specific topic with a series of actions that addressed a series of review criteria. The teachers were asked to approach the site from a lesson-gathering perspective, as if they were initiating a search for instructional materials for classroom implementation. As such, they utilized the search functions within each site reviewed and used the available tools and features to find a resource on a specific, consistent topic. When a viable resource was found, it was explored and documented in light of anticipated classroom implementation. If a resource was not found, the teacher was instructed to modify the search to find a topically related resource, or “best fit.” The features of each site were charted within a checklist framework that was developed jointly by the SCEMS research team and contractors and that was based on the criteria used for a similar process conducted by the contractors for the California Department of Education (See Appendix A). The charts are not evaluative; they are a means of recording the features and functions that each site offers. The features chart and a more detailed explanation of the search processes and documentation approaches are included. (See appendices B and D.)

The Project Team conducted the evaluative process for reviewers using a simple framework which focused on feature options generally related to search, navigation, instructional modifications, interactivity, and annotation. While recording these types of features for a given site, reviewers were provided a more specific framework to surface the means and the degree to which the sites approached these elements. The framework is as follows:

1. Multiple Search Modes and Ease of Navigation
   a. Search yields relevant resources.
   b. Resources are “findable.”
   c. Searches are simple and highly filtered.
   d. Interface is intuitive, intelligent, and provides search hints.
   e. Visual display of search results facilitate the analysis of content with meaningful metadata.
   f. Search yields high-quality images from collections.
   g. Search reveals extensive content partnerships.

2. Customization Tools for Classroom Instruction and Implementation
   a. Includes features that enable users to save and assemble their own resources for use with new descriptive data and information.
   b. Offers flexibility for presentation to the class, a group of students, or an individual student.

3. Opportunity to Interact with Content and Promote Advanced Online Learning Exchange

---

1 This framework is based on a derivative model created from David Hyerle’s Holistic Scale for Assessing Digital Thinking Maps and Processes in Visual Tools for Constructing Knowledge, as published by the Association for Supervision and Curriculum Development, 1996.
a. This may include features that provide teachers and learners options to interact with resources and content and may also provide a space in which to exchange learning in online communities or forums.
b. This may include tools that promote learner-centered lessons.

4. Opportunity to Share Instructional Modifications and Supplements Online
   a. This may encompass methods for teachers to upload and distribute their own modifications to existing resources or add their own supplemental documents or resources to online elements.

In each of the categories, systems were assigned the symbol + for “advanced provision,” the symbol ✓ for “provision,” and the symbol - for “no or limited provision.” Those providing advanced provision for multiple categories were highlighted as examples of best practice. Full reviews for each site are available in Volume IV, Appendix A.

Sites Reviewed
Museum Sites
Smithsonian Education: smithsonianeducation.org
The National Archives Experience: Docs Teach: http://docsteach.org/home/constitution
ArtNC: http://artnc.org/
TATE: http://www.tate.org.uk/learnonline/
New York Public Library: http://www.nypl.org/events/teaching-learning/tools
Philadelphia Museum: http://www.philamuseum.edu/education/lesson_plans.html
Tenemnt Museum: http://www.tenement.org/education_lessonplans.html
Library of Congress: http://www.loc.gov/teachers/
The Kennedy Center: ArtsEdge: http://artsedge.kennedy-center.org/educators/lessons
ArtsConnectEd: http://www.artconnected.org/
The British Museum: http://www.britishmuseum.org
The American Museum of Natural History: http://www.amnh.org/ology/
The Museum of Fine Arts, Boston: http://www.educators.mfa.org

General Education Resource Sites
Ted-Ed: http://ed.ted.com/
Discovery Education: http://www.discoveryeducation.com/free-puzzlemaker/
PBS Learning: http://ca.pbslearningmedia.org/
Better Lesson: http://betterlesson.com/
Gooru: http://www.Goorulearning.org
Khan Academy: http://www.khanacademy.org/
National Geographic Education: http://education.nationalgeographic.com/education/?ar_a=1
National Geographic Little Kids: http://kidsblogs.nationalgeographic.com/littlekids/
OER Commons: http://www.oercommons.org/
Thinkfinity: http://www.thinkfinity.org/
Curriki: http://www.curriki.org
The Jason Project: http://www.jason.org

Digital Collection Sites
Europeana: http://www.europeana.eu
Smithsonian Collections: http://collections.si.edu
National Gallery of Art: NGA Images http://images.nga.gov
Internet Archive: http://archive.org

Findings
After examining all 33 sites across the three categories (Museum Education, General Education Resources, and Digital Collections) for common features and capabilities, reviewers highlighted an essential set of technical features and content assets of particular relevance to the research questions being explored. The charts found in Appendix D provide a detailed summary of all features. The areas of particular interest summarized below include:

1. Technology and Design
2. Searchability/“Findability”
3. Content Assets
4. Annotation Capabilities
5. Presentation/Accessibility
6. Tools and Functions
7. Intellectual Property (IP) and Usage Policy

Technology and Design
Technology and design speaks to how audience is interpreted and how open and accessible the content on the site is.

Nineteen of the 32 sites studied (59%) were designed primarily for a teacher audience rather than the student. The other 13 offered student portals, or were developed with certain features designed specifically for students, but did not present a comprehensive “student side” to their site. Only two of the sites were specifically geared towards children. Museum sites represent the larger proportion of those whose intended audience is teachers only, with general education sites more targeted for a combined audience of teachers, students, and others (i.e., parents).

These findings reflect the current research and reinforce the fact that education sites tend to recognize the teacher as a first tier of engagement, and take up students as a secondary audience consideration. The sites tended to grant public access to the majority of content, and several of the portals offered log-in access in order to utilize the organizational tools and lesson-building features. A little less than half of the sites allowed users to set up custom grouping and content restructuring elements within their portals to create unique, sub-community coalition and collaboration. High-speed Internet was helpful, especially for rich content sites, but specific browsers were not necessary as long as the version of the browser being utilized was less than two years old. Occasionally, a specific program (e.g., Adobe Flash Player or QuickTime Viewer)
was required to view content. Four of the sites offered some content in languages other than English, but full language translation services were only available on one of the sites viewed. Accommodation for handicapped or learning-disabled users was not commonly observed. However, much of the supporting literature indicates that sites have moved from embedding accessibility utilities directly into site content and architecture to an adherence to accessibility specifications during initial site development. This allows a site’s primary content to be more readable by external accessibility software and browser features designed to support diverse consumption needs.

Searchability/Findability

The primary means by which a user can search for resources on most sites was through keyword searches or drop down menus, provided that adequate drop down options were available. The reviewers were able to find content close to what they were looking for with general search terms. Specific topic content was not always available, depending on the focus of the site, but often an adequate resource was located with general search terms. On some sites, there was a taxonomy of terms already provided for browsing. One site included a helpful word cloud, but its functionality was limited in comparison to other sites’ taxonomies. Several sites allowed for filtering of grade or subject area, or even resource type, but only three sites offered filtering by both State and Common Core Standard (SCEMS, Jason, and Thinkfinity).

Content Assets

The digital learning resources represented in the selection of 32 sites was varied, but mostly consisted of primary source materials, lesson plans, and interactive modules. Seventy percent (70%) of the sites contained primary source materials, sound clips, and videos. Sixty-six percent (66%) contained lesson plans, and some offered a way for the user to group resources into a shareable combination that could supplement a lesson plan. Twenty-two of the 32 sites (68%) offered interactive modules that students or teachers could use and manipulate, or games that were standards-based for students. Only five sites offered real-time content or virtual museum spaces or tours for students with limited ability or resources to visit the actual museum. The sites were typically focused around specific topic areas, generally along the same lines as the museum itself. In most cases, the users could not contribute materials nor tailor the content to fit their needs.

Only six of the websites provided personalized filtering prompts (e.g. “if you liked this, you will also like this...” or “similar resources are...”). In both the Museum and General Education categories, roughly half had content hyperlinked to state standards. Common Core standards matching was only available on the SCEMS, Jason, and Thinkfinity sites. SCEMS offers the only museum site that provides content hyperlinked to both State and Common Core standards. In most other cases, the standards were listed on the side of the resource page. Only six sites offered commercially licensed materials for sale on the site. Four of these were museum sites (British Museum, Philadelphia Museum of Art, New York Public Library, and TATE Gallery). On several of the sites, especially those that offered the ability to group resources or create lesson plans, users could create profiles for the storage of content and interest.

Annotation Capabilities
The ability to share, rate, and comment on resources varied widely on the sites that were viewed. When one could comment on or rate a resource, a log-in was necessary. Because this feature wasn’t available on many of the sites, the ability to comment on or rate a resource was limited. A community space for discussion was not observed on most sites. If the site offered log-in access, then the user could usually save resources to a file on the site. The ability to share a resource, however, was extremely widespread. In most cases, sharing buttons (like for Facebook, Twitter, Google+, and a plethora of over 100 other social networks) were usually on the resource page. The ability to print a resource for classroom use was also usually embedded on the sites. No sites allowed for pre-designated projection of the content onto a video screen (other than through a simple VGA cable projection).

Slightly more museum sites than general education sites offer the ability for teachers to build lessons with existing content, but this is overall not widely available on either museum or general education sites. Only five out of 15 museum sites (33%) allowed teachers to build lesson plans and three out of 13 (23%) general education sites offered this feature.

**Presentation/Accessibility**

Visualization of search results was an important issue raised in the literature. Users need sufficient data about the success of their searches in order to determine whether a resource should be extracted or is of value to the user. Reviewers found that the images and videos displayed were regularly accompanied by appropriate text or metadata to render them easy to analyze. The descriptions surrounding the objects, however, were most often written for an adult audience, and not deemed “kid-friendly.” The images were usually clear and easy to view and read, with the obvious exception of some primary source documents that were aged or written in an original font not easily read by the contemporary reader. In most cases, there was a thumbnail of the resource that one could click on and be taken to a page that provided more detail about the resource (e.g., links, standards, similar sites).

**Tools and Functions**

Toolsets for lesson building were rarely found. This is a clear gap area, which SCEMS might fill.

Very few of the sites offered the ability to create a lesson through extraction of present content, integration of other resources, or implementation within a specific setting. On some of the sites that did offer lesson plan functionality, however, the researchers found that there were two types of lesson plans offered: 1) a pre-constructed lesson that contained supplemental materials and resources from the site and 2) a platform on which to organize resources in a presentable way, but not necessarily contribute supplemental materials such as Word documents or self-created PDFs.

The pre-constructed lessons were generally created by museum employees or contractors. They included graphic organizers, vocabulary lists, discussion questions, timelines, or tests and quizzes for the teacher to choose from. These supplements were limited and usually age-specific, so teachers would need to adapt them to suit their needs. In the second type of lesson plan, teachers were able to curate and organize the content (such as works of art) into a schema that made logical sense to them, in order to share it with their classes. However, in these plans, the
ability to contribute supplemental materials was not evident. For example, a teacher was able to group three pieces of art into a presentation, but couldn’t embed discussion questions or a culminating activity within the presentation. Most sites didn’t include tools that provide users a means to display or render the resources with the intent of demonstrating them to a classroom, other than the simple use of a VGA cable. By copying the URL, teachers could push these plans onto a student-access view page externally, but tools to do so were not provided. On DocsTeach, specifically, students could access the plan online and work through the activities, then send the teacher the results of their work.

There were many sharing tools (usually social network buttons or a print button) that allowed teachers to share the results of what they found and/or their information with other users on the site, other colleagues off the site, or other Professional Learning Networks (PLNs) or communities that a teacher might belong to. However, the ability to utilize existing social media profiles to create a profile or page on the site was not observed, though many sites asked that users “follow” them on their own profile pages on those social networks.

Tools or functions available to help one assess the learning outcomes of the lesson within the site were not observed. There was also a nearly complete lack of available lessons or resources that could be used with an interactive whiteboard, such as a SmartBoard or a Promethean Board. This is most likely because of the specific programs required (e.g., ActivInspire).

*Intellectual Property (IP) and Usage Policy*

When considering Intellectual Property and Usage Policies, it is important to identify and understand the relationships between the real world artifact and related IP components. Where the creator/owner of a collection of artifacts administers the repository and dissemination of those artifacts, copyright typically remains consistent across the artifact, its metadata, user-generated paradata, and derivative works. In relation to digital repositories administered by museums, while the museum often has physical possession of the artifact, the individual copyrights of and usage policy governing any one artifact is determined by the provisions agreed upon by the artifact owner. These can be highly specific to a given collection or even to individual items within a collection and vary widely across collections that are under a museum’s stewardship.

Larger, comprehensive museums additionally have works under no copyright (public domain) and, at times, works under unknown copyright. Ultimately, even when individual copyrights can be established for individual artifacts, those copyrights vary significantly across a museum’s assets and are then subject to modification when determining the development of third-party metadata, user-generated paradata, and derivative works. Intellectual Property has always been at the crossroads of conflicting
interests among the creators, rights holders, and the general public. Striking a balance between conflicting copyright-related interests has always been a vexing problem.²

Within each category of sites reviewed here—Museum, General Education, and Digital Collection—there appear to be several varied approaches to end-user policies and IP. Each site has a specifically tailored usage policy depending upon content and types of users (educators, students, learners, etc.). Museum and digital collection sites have more complicated IP constraints than general education sites due to the ownership/provenance of the real world artifacts in their collections, a large majority of which were obtained prior to digitization and the advent of mass, online dissemination.

Most general education sites on the other hand, do not physically possess the same types or amounts of actual assets. In many instances, the real property of education sites is intellectual in nature and format and/or an aggregation of third-party resources and data from partners and users alike. For example, Khan Academy holds only digital resources or Open Educational Resources, thus applying the "Creative Commons Attribution–Non-Commercial–ShareAlike 3.0 United States (CC BY-NC-SA 3.0)." Khan Academy allows anyone to share and remix or adapt education resources with attribution, for non-commercial use, and any alteration to a resource that a user makes must inherit the same CC license.³

Museum sites such as the National Archive's DocsTeach, much like smithsonianeducation.org, are often in a position to fashion a site-wide usage policy that must cover a broad range of copyright restrictions invariably linked to real world artifacts.⁴ In order to reduce the liability associated with copyright infringement, DocsTeach's usage policy ultimately transfers due diligence and copyright liability to end-users. DocsTeach uses what can be called a deferment approach by first disclosing that a large majority of its resources are in the public domain or "mostly public domain" and thus may be reproduced without permission. Second, DocsTeach adds that not all of its resources are in fact in the public domain and cannot guarantee their copyright status. Therefore it is the responsibility of the user to determine the copyright status of each resource they decide to reuse or modify. DocsTeach makes an attempt to balance the goal of free access to knowledge without having to codify a single, specific copyright scheme.

Excerpt from the National Archive’s DocsTeach Terms and Conditions for Using Our Website (http://docsteach.org/privacy) - Copyright, Restrictions, and Permissions Notice:

- Records used on this site are from the holdings of the National Archives. Generally, materials produced by federal agencies are in the public domain and may be reproduced without permission.
- However, not all materials (including images, sound, cartographic, textual, or electronic materials) appearing on this web site are in the public domain. Some materials have been donated or obtained from individuals or organizations and may be subject to restrictions on use.

² See: http://europe.creativecommons.org/webfm_send/15 p.8
³ http://creativecommons.org/licenses/by-nc-sa/3.0/us/
⁴ http://docsteach.org/privacy, http://www.si.edu/TermsOfUse
The National Gallery of Art, a Digital Collection site reviewed here, provides end-users with a similar "mostly public domain" escalation approach as DocsTeach and smithsonianeducation.org. As demand for Open Educational Resources increases, this balance between open access and protecting copyright will become untenable.

In terms of copyright, the key difference between, for example, general education sites such as Khan Academy and museum and digital collections sites who reference real world artifacts is that end-user licensing, e.g., Creative Commons, favors digital resources and representations. In fact, Creative Commons licensing is modeled upon addressing the needs of software developers, both commercial and open source.\(^5\)

SCEMS is in a unique position not unlike the National Archives due to its goal to provide digital access to museum artifacts each having unique copyright restrictions while at the same time delivering the freedom of rich interactive educational tools with the expressed intent of open educational access and use. The model of IP that SCEMS must contend with emerges when dealing with the two domains of digital replications of artifacts for educator/learner use and modification of data affiliated with those replications. The challenge is to allow for unique derivative works to be generated by educators and/or learners for formal and informal exchanges that are not deemed to infringe upon the copyright of the originating artifact. An abstraction between artifact and digital resource must be created in order for SCEMS to fulfill its goal for the “increase and diffusion of knowledge” through this type of deployment.

The deferment method can be utilized to transfer responsibility of use to the individual users of this system with identified access to avenues of further discovery and research for independent analysis on the intended use cases. One key aspect will be in the consideration given to allow end-users to re-post derivative works back to the SCEMS site and system, or merely include push features that assign the sharing of derivative works to the individual user within external environments without the endorsement or the technical support of SCEMS or Smithsonian proper. On the other hand, a logical defense of appropriating the sequencing and customization tools as a central, known, and controlled process by an issuing agency such as the Smithsonian, ensures a minimal threshold of documentation and citation. This would otherwise not occur on any official level when educators and learners make such modifications in isolation.

**Findings within Categories**

The above synthesis looks across site categories at common features and functions. Reviewers also analyzed their findings within categories to surface important trends.

Museum Sites

While museum sites are continuing to make credible advancements in developing and deploying tools that allow educators the means to independently save and distribute educational content, few provide open learning resources and curriculum elements that can be shared easily within and across different websites. Museum sites still serve as a primary publishing point for curriculum collections and materials as generated by centralized, internal teams, and those materials are largely deemed effective and comprehensive across educator audiences. Yet research shows that greater learning gains are achieved when digital resources successfully integrate tools for student/teacher collaboration in conjunction with institutional goals and intentions for the curation of those very same resources. The challenge is how to translate deep curation knowledge into educational content for both teacher and student. Curation knowledge is usually considered authoritative and not immediately predisposed to discovery modes of learning central to personalized learning.

The number of museum agencies electing to complement collections assets with interactive tools remains modest. As teachers continue to make resource modifications and produce supplementary materials to create greater accessibility for more students, those modifications and guidance documents that promote deeper student discovery and interaction with the resources go largely unknown. This review and analysis focuses on some of the more popular museum-related resource sites and the steps they’ve taken to promote discoverability through established taxonomies like instructional subject lists or content standards, user-directed organization of content for presentation to students, and finally, development of instructional items and interactive components that promote learning.

Additional Findings in Museum Sites

- Most sites were easy to search. Keywords, tags, and drop-down menus enabled the user to quickly find resources. On the SCEMS site, a specific resource was found in approximately 30 seconds. The Kennedy Center (ArtsEdge) delivered Civil War letters in about 15 seconds through a keyword search.

- The origin of the material is reliable and updated regularly. Some sites are updated weekly, some monthly. Museum resources carry authority and are internally vetted by museum and other experts.

- Sharing buttons are well integrated into most sites. Social media (such as Facebook, Google+, and Twitter, among others) were popular buttons used to share resources directly from the resource page. Other resources could be emailed. The opportunity to share instructional modifications and supplements online opens a clear path for users to interact with each other and provides the materials for online communities and forums.

- None of the sites listed offer multiple modes of educational resource discoverability, the customization of resources for classroom instruction and implementation, the opportunity

---

6. [http://projectred.org/about/research-overview/findings.html](http://projectred.org/about/research-overview/findings.html)
to interact with content and promote advanced online learning exchange, in addition to
the opportunity to share instructional modifications and supplements online.

- Smithsonianeducation.org is the only museum site reviewed that offers filtering by both
  State and Common Core Standards.

- DocsTeach comes the closest to combining thousands of primary source documents with
  lesson building tools in an easily navigable platform, but limits users to seven
  instructional tools and finite means to receive resulting student work.

**General Education Sites**

The general education resource sites differ in their approach to audience. Where the
museum sites reviewed tended to be more focused on the teacher-user, the education sites
reviewed were designed with a broader audience in mind that would include the student and
sometimes parents. For example, within some general education sites, teachers are able to create
a personal class portal and reorganize or package the resources to create personalized learning
activities. These portals can then be shared with students for student-driven inquiry, putting the
resources and the learning experience directly in the hands of the learner. Museums are
beginning to offer these features as well, but their perspective on their audience still focuses
largely on the teacher as the main user and interpreter of content.

Another approach used by education sites was to initiate pre-designed layers or areas of
the site for students to explore content on their own. Enabling users—teachers, students, or
both—to create and customize their own section on a site and share resources is a function that
could be considered strategic for inclusion in the Smithsonian prototype feature set. With this
approach in mind, consideration would need to be given to modifying the collection asset
parameters for various audiences, modifying design, and potentially creating differing metadata,
and thus search features, for teachers and students.

**Digital Collection Sites**

The digital collection sites offer the deepest and most expansive digital collections. These
sites contain thousands of resources (primary, audio, visual, text, etc.) that have been curated
from numerous individual collections. Many of the sources are other museums, databases,
archive collections, national libraries, and user-generated content (archive.org). The fact that
these sites contain such extensive data is a strength. However, some of the sites appeared
cluttered or difficult to navigate.
Review of Best Practices

A further evaluative process of sites was performed using a framework (see Methodology) which examines the degree to which sites offer ease of navigation; instructional flexibility and support and capabilities for annotation; and the collection and sharing of resources. Reviewers did not find a particular website that exemplified best practices in all areas examined, but the evaluation did surface some common categories where sites are excelling. Where applicable, screenshots are provided as examples of a best practice implementation.

Authoring Tools and Lesson Builders

The following websites offered innovative instructional authoring tools and developed lesson plans, designed by other educator-users of the system.

The Kennedy Center: ArtsEdge

ArtsEdge: This site, sponsored by the Kennedy Center, provides users with lesson plans, audio stories, video clips, and interactive online modules that are aligned to both national and state standards for the arts. The site provides multiple modes to discover resources through the pre-grouping in easily reorganized lists. These are sorted according to grade level, subject area, and can be viewed in a list view as well as thumbnail view. Each lesson plan is very clearly laid out and includes time required, overviews as well as supplemental materials, and built-in tools that enable the user to display pieces of the lesson in several different formats. This format allows the user to see the resources and sort them in a specific manner.

The National Archives Experience: DocsTeach

DocsTeach: Maintained by the National Archives, this site—based on activities focused on the United States Constitution—is compelling at first glance. There are templates for lesson building ready to go that simply need input and personalization from the teacher. Correlated to National History standards, the site utilizes Bloom's taxonomy. A screenshot of the activity-builder tool follows:

Thousands of primary source documents are ready to print or use within an educator-designed, interactive, and student-driven activity. The main structures of the activity are a variety of expository text structures (sequencing/sequential, “weighing the evidence”/compare-contrast). Multiple modes of educational resource discoverability are supported through the streamlined and uncluttered site design. Users can create (and save) their own activities and can also view other educators’ activities (with their supplemental notes saved as well, when educators have added them). This process allows for both the customization of resources for classroom instruction and implementation as well as the opportunity to share instructional modifications and supplements online with other educators. Some of the lesson plans are designed in-house and available on the homepage, and others are curated from other users on the site. Students can complete the assignments online and email the results to the teacher through the site. Hyperlinks are provided on the activity page for teachers to post to a website for their students. Through these processes, this site provides users, their colleagues, and their students with the opportunity to interact with the content through meaningful exchanges. The site promotes advanced online
learning exchanges at a level that is not offered by other sites. Overall, this site possesses a clear layout of resources and is very streamlined with large icons and simple words. It provides a powerful example of how Smithsonian could expand the way its resources are accessed by its users.

North Carolina Museum of Art

ArtNC: This site allows the user to build concept maps around pieces of art. By providing the user with this ability to customize resources for classroom instruction and implementation, ArtNC includes features that enable users to assemble the resources for use within the classroom. These “concept maps” list grades, subjects and concepts, and can be used within a class to specifically teach educator-designed concepts like “family,” “cycles,” “interdependence,” etc. Lessons are also provided that contain assessments, resources, background information, and comments from other users. The user is equipped with tools to interact with the content and has an opportunity for advanced online learning exchange through the comments from other users. Complete lesson plans also list student learning objectives and standards. The Concept Map building platform is what this site does best. Here is an example.

ArtNC was also highlighted as especially helpful to teachers of special education students. Easy Approaches to Teaching with Objects offers important differentiation for Special Education Students. Using the concept maps provides a way to build comprehension for a text.

Philadelphia Museum of Art: Education

Philadelphia Museum of Art: This site gives users the opportunity to interact with content and create a “My Museum” profile. Users put together galleries of their favorite objects from the online collection. Through the customization of their own ‘tour’ and then sharing resources with others, this site provides its users with the opportunity to share their instructional modifications.

The ability to customize resources for classroom instruction and implementation is also present. This site also provides tools that are useful to teachers needing to adapt resources for struggling students. Two examples follow: the first, “Looking to Write and Writing to Look” provides teachers with ideas to support literacy development using anchor standards (for PA and NJ) and could be broken down into smaller IEP skill goals. It also provides an assessment rubric. The second resource, called, “What Do Primary Sources Tell Us about Life Styles?” is a lesson plan that allows for modifications for different grade levels and offers formative and summative assessment ideas.

Online Exhibitions

While not offering customized tools, the following sites do offer curated resources for supporting teaching and learning in an interactive setting. When sites enable students to navigate through interactive modules and simulations, it encourages them to further their own learning, despite shortcomings in time or location dependencies. The following sites expand existing information into activities, presentations, and online museum spaces and tours that the students can access independently or with a teacher.
The British Museum

The British Museum: In the children’s section of the site, the British Museum offers online tours of different countries through resources within their museum collections. Users can browse through objects representing Africa, Asia, the Americas, Britain, Egypt, Europe, Japan, Greece, the Middle East, the Pacific, and Rome. Additionally, through their “Museum Explorer” program, students can select either an area from a map or a topic, or both, and are then taken to a site with a variety of resources for the student to browse.

The New York Public Library: Tools for Teaching

New York Public Library: This site provides quite a bit of web-only presentations based on its collections that include interactive elements or curriculum ideas. A few examples are “Immigrant City,” “African Americans and American Politics,” and “Historical Postcards of New York City.”

Tenement Museum

Tenement Museum: This site is a virtual New York tenement house. There is also a “Become an Immigrant” simulation where students go on a virtual journey from Ellis Island to an immigrant quarter of the city. Other simulations enable students to interact with history in a more tangible and engaging manner.

Creating Instructional Portals and Student Accessibility

The following websites stand out as strong examples of how sites are making their resources accessible for student use and inquiry. The ability to collect, synthesize, and analyze information on their own is an important skill that students need to develop in order to thrive in the 21st century. These websites encourage students to access materials on their own, allow teachers to present resources to their students (See PBS Learning), and enable educators and parents to monitor student use (See Khan Academy).

The Jason Project

Jason: Jason is similar to the other general education sites in that it allows teachers to create a portal and share selected activities with students (who connect to the teacher by registering with a class code). What Jason provides that sets it apart is the “My Journal” feature, where students can write entries as they explore various resources. These entries are saved in the student journal, rather than within the resource itself. The journal is shared with the teacher as an assessment tool.

Khan Academy

Khan Academy: Khan Academy is similar to other video-driven resource databases designed for student independent use. Khan Academy’s innovation in regard to digital technology in the classroom stems from its ability to track student usage and send reports to teachers. In fact, this ability has proven useful for several schools in the San Diego Unified School District, where classrooms are using the videos as content reinforcement in a flipped classroom environment. One school in particular is considering a model in which math students would be responsible for watching the instructional video that comes with a lesson, then performing the practice equations in class the next day under the guidance of the instructor. This situation is called “flipping”
because it allows for instruction to occur at home while practice is completed in class. In optimally flipped classrooms, personalized instruction occurs with more hands on help from the instructor.

National Geographic Education

**National Geographic**: National Geographic is an excellent example of building context around a resource in order to provide students with background knowledge and a “full service” learning experience. Articles come with vocabulary lists, links to additional resources, interactive modules, and suggestions for further reading. There is also a sidebar area with a glossary of key words that students can use for reference and an encyclopedia applet so that students can look up information relating to the resources within the same frame.

PBS Learning Media, California

**PBS Learning**: PBS Learning illustrates how sites can create an online space for teachers to link resources, re-arrange elements or create a mash-up that fits their needs. PBS Learning allows teachers to create an online space where they can link different resources together in folders and create a sequence of resources that can be shared with students.

Ted-Ed

**Ted-Ed**: Like PBS, Ted-Ed is developing ways for teachers to create an activity that students work through independently. Ted-Ed allows teachers to work from a video resource to add their own context, discussion questions, and video breaks to create the activity they want. Ted-Ed allows teachers to determine the context by providing background readings, discussion questions, worksheets, or graphic organizers that fit how the teacher wants the student to use the resource. Additionally, Ted-Ed will track data on sample questions and send students’ grades to the teacher.

Ease of Navigation and Search Features

Aggregator sites that pull from a large number of contributors create a single entry point for teachers to get a broader selection of resources. These sites differ remarkably in interface and design but each offers something unique to the teacher.

Gooru Learning

**Gooru**: This site succeeds in bringing together multiple contributor sites and creating harmony and an intuitive interface. Search results appear as thumbnails that are categorized under headings for each type of digital resource (i.e., videos, interactive modules, quizzes). Gooru also has an excellent feature to display the partner resource in an applet within Gooru, which saves the user time by eliminating the need to navigate back and forth between Gooru and any external sites.

OER Commons

**OERCommons.org**: This site is another example of an open commons that brings together resources from users and third party contributors. OER is most like Thinkfinity (see below) in the way that users are often directed outside the platform in order to access a resource from the original third-party contributor. OER stands out, however, in how it uses Open Author to bring
these sources together and to flag each source with a unique and clear “Conditions of Use” from the original creator. Users can filter searches by “Conditions of Use” and “Content Source,” which adds a beneficial layer of protection to the commons format.

Thinkfinity
Thinkfinity.org: This site offers many search features, filters, and the ability to look through a list of standards for each state or the Common Core. While tech-savvy teachers may revel in the options, it is somewhat difficult to navigate back and forth between Thinkfinity and the Thinkfinity Community. The search results are text-based, with a written description of each resource. The links take the user out of Thinkfinity to the original contributor site. This results in a lot of time spent weeding through resources and being redirected to the partner site for each one.

Numerous Contributors and Partners
The following sights offer deep collections of their own or aggregated collections from multiple partners (or both). This type of depth, when designed with such an intuitive interface, provides the user with more high-yield searches.

Europeana
The Europeana Foundation: This Dutch site combines the collections of individual libraries, audiovisual collections, archives, and museums across Europe. It is fairly easy to navigate and is primarily designed for teacher-users to provide interpretation for their students. However, it could also be used as a resource for students compiling content. It includes primary source materials and allows users to create profiles and customize pages for the storage of content of interest. Also available are tagging, to sort the resources, and a community space.

Internet Archive
The Internet Archive: This is a somewhat cluttered site, but offers a deep collection of primary documents, audio, video, and other materials from a large variety of sources, uploaded by program-savvy users. The images are clear, and the user is able to preview images or resources before accessing them. While there is a vast amount of content, the navigability of the site is compromised because of the layout.

National Gallery of Art: NGA Images
NGA Images: This site provides public access and is primarily meant to be interpreted by the teacher for the student. Primary source materials (artworks) are available and users can create “lightboxes” to store images they find interesting or useful. This gallery view is convenient for previewing images.

Smithsonian Institution Collections
The Smithsonian Institution Collections Search Center: This digital collection allows access to many different databases, archive collections, library catalogs, and museum collections in an easy-to-search platform. Again, this site seems designed with a teacher, researcher or sophisticated user in mind. The search capacity is extensive; results can be filtered by grade, subject area, or resource type. Key terms are automatically generated below a general keyword search. Users can create profiles and customize pages for the storage of interesting content.
Both the Europeana Foundation and the Smithsonian Institution Collections allow users to add tags to sort and differentiate resources in a way that makes logical sense to users. The Internet Archive allows users to write a review of the resource, but tagging isn’t an option. All three sites allow the user to filter findings by resource type, which can be useful when trying to find an audio recording or video to integrate into a lesson. Users can create profiles for the storage and creation of lists for content of interest on both the Europeana Foundation and the Smithsonian Collections site. These profiles allow the user to connect and group resources according to their own logic. On the Internet Archive site, users actually create a profile through which they upload content themselves. In order to do this, however, one must have knowledge of basic programming and file transfer protocol steps.

Positioning SCEMS in the Field

Regardless of the variety of web-based resource sites reviewed, the effort was to process them through a common set of cross-filters and analyze the methods in which they provide users access to resources, as well as use, annotation, and integration of resources in external communities or systems. The descriptive framework to capture distinguishing characteristics encompasses many features, but as has been cited earlier in this document, we have opted to identify four general categories. Below is a comparative analysis of those categories comparing the existing SCEMS system to a general selection of four reviewed sites deemed Best Practice examples from various segments of this environmental scan. These Best Practice sites—Khan Academy, Gooru, DocsTeach, and ArtNC—also possess components that would offer an excellent basis for eventual prototypes to be developed.

(In each of the categories, systems were assigned the symbol + for “advanced provision,” a ✓ for “provision,” and a - for “no or limited provision.”)

Figure 3. Best Practices Comparison

<table>
<thead>
<tr>
<th>Category Description</th>
<th>SCEMS</th>
<th>Khan Academy</th>
<th>Gooru Learning</th>
<th>Docs Teach</th>
<th>ArtNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Search Modes and Ease of Navigation</td>
<td>✓</td>
<td>+</td>
<td>+</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Customization of Resources for Classroom Instruction and Implementation</td>
<td>-</td>
<td>+</td>
<td>✓</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>Opportunity to Interact with Content and Promote Advanced Online Learning Exchange</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>✓</td>
</tr>
<tr>
<td>Opportunity to Share Instructional Modifications and Supplements Online</td>
<td>✓</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>✓</td>
</tr>
</tbody>
</table>
Presenting the existing SCEMS resources in a comparative format with the identified sites can point the way toward future direction and opportunities. These sites, collectively but not singularly, have developed a series of features responsive to the growing needs in education for diverse, quality resources that can be organized, customized, and deployed in various formats and environments. SCEMS sits in a unique position in that it has extensive access to large stores of exceptional native resources as part of the Smithsonian family without having to define its proximity to these resources as a third-party aggregator. Through the strategic development of certain tools and features, SCEMS could best use this proximity to make continued use of its education content development expertise by combining it with educator-enabled assimilation and sharing utilities to bridge many of the gaps inherent in other resource provider solutions.

Conclusion and Recommendations

If we examine the features and functions most available to teachers on the 32 sites reviewed, we can conclude that teachers have the opportunity on many sites to find and share content that is valuable to them in the classroom. What is not being provided, and what the literature tells us that teachers want, are sites that offer:

a. Flexible assets for use in multiple ways with students to engage their interest.
b. Tools that maximize the use of high-quality images.
c. Tools and suggestions to help users adapt resources for diverse learners.
d. Content aligned to Common Core standards.
e. The ability to collect and save resources in a dedicated space on the site.
f. Easy ways for viewing content and search results.

This review also points out gaps in the areas of assessments tied to content, flexible media display options, user profiles, and the ability for users to add their own resources to their collections or folders.

SCEMS is filling some of these needs well by providing high-quality content that is searchable by standards (both state and Common Core). Prototypes should explore the extent to which teachers can further maximize the use of Smithsonian assets by providing features such as:

- Easy-to-use search and save features
- User profiles to facilitate customized search results
- Options for viewing search results to facilitate analysis of content
- Tools that maximize the high-quality images in the Smithsonian collection
- Tools that enable teachers to assemble content within their own schemas with helpful hints or adaptable templates
- Assessment tools
- Tools for adding additional resources
- Student-friendly tools that are learner-centered

In looking toward prototype testing, a selection of best practice examples provided here may serve as useful proxy in combination with operational and semi-operational prototypes.
Appendix A

Overview of All Sites Reviewed

Museum Sites

Smithsonian Education: http://smithsonianeducation.org/

*Smithsonian Education is the SCEMS site and is our point of comparison for this project.*

*Navigation/Findability:* Resources can be grouped by subject or grade level, and a keyword search is also offered. One can view the state standards for each resource. Resources can also be searched via their alignment to national, Common Core, or state standards. Each pre-constructed plan comes with an introduction and a description of how to best use the resource within the classroom. While they are presented in lists, a readily sortable collection of searched resources is not available.

*Content Assets:* What this site does well is provide teachers with the lesson plans, PDFs of supplemental materials, and primary source documents that they can immediately use in their classrooms. Boasting a collection of over 2,000 resources, teachers have a large database from which to pool elements to use in their lessons. Lesson plans are segregated into four categories: Art & Design, Science & Technology, History & Culture, and Language Arts. This site also offers suggested readings and recommended sites for students.

*Lesson Building and Sharing Tools:* Users can also write reviews for other educators, which are subject to approval, but no registration is required. There are sharing buttons available as well (Facebook “Recommend” and a “Share This” button). However, the site does not offer teachers with the tools to build a customized lesson plan using Smithsonian resources.

DocsTeach: http://docsteach.org/home/constitution

*DocsTeach is a website provided by the Foundation for the National Archives that encourages teachers to use primary sources in the classroom. They do this through flexible toolsets and activities that teachers can use for classroom demonstration, as full-class or small-group activities, or as individual in-class or homework assignments. The site allows teachers to share the activities they find or create with their students via a unique web address, as well as manage activities in a personalized account.*

*Navigation/Findability:* This site is extremely easy to navigate and provides both public and personalized access. The average time it took to find a quality resource was a minute and a half. The content is geared toward teachers preparing for lessons. Specific applications, such as Flash, are needed to view certain content. The user is able to find content with general search terms and can choose whether or not to filter by a provided taxonomy of terms, by subject area, or by resource type. A user who is registered can also star certain items to bookmark them for later viewing.
Content Assets: There are thousands of primary source documents, selected from the billions preserved at the National Archives. The site includes lesson plans, interactive modules, audio, written documents, maps, charts, graphs and videos. All content that is authored and provided by the National Archives Education Team is hyperlinked to the National History Standards. Users can create profiles and customize multiple “classrooms” for the storage of content of interest, and can they save content to a file on the site. Users cannot publicly comment on a resource, but they can star a resource for personal use. Sharing is possible through embedded tools that allow the user to print the resource, or share it with their students. If teachers provide their students with the unique web address for an individual activity, students can complete the activity and email the results if desired. Registered users can bookmark documents by starring them. Images, videos, and other viewable content are accompanied by appropriate metadata to assist teachers in analyzing their appropriateness for the classroom. The images are high resolution, in linear view, and the user can preview images or resources before accessing them. With the DocsTeach tools, users can create activities that vary according to their placement on Bloom’s taxonomy. Existing activities, provided by the site, are already designated in this manner.

Lesson Building and Sharing Tools: Teacher-added lesson-building tools accompany the resources that can be used to create a lesson, such as graphic organizers, vocabulary lists, discussion questions, timelines, and tests and quizzes. There are tools that allow the registered user to connect or group resources according to their own logic, within their personalized accounts. Additionally, there are embedded tools that provide the users with a way to share the results of what they find or their own information with other users on the site, other colleagues off the site, or other user communities. The user can share internally on the site and can also email the unique URL of the activity they created for student or public access. The results of the completed activity can be emailed to the teacher if desired.

ArtsConnectEd: http://www.artsconnected.org/
ArtsConnectEd is a site that offers the combined collections of the Minneapolis Institute of the Arts and the Walker Art Center. It is an interactive website that provides access to works of art and educational resources for teachers and students. It has two environments: Art Finder and Art Collector. Art Finder is a place where users can browse the museums’ digitalized items, and Art Collector enables users to save, customize, present, and share items in “Art Collector Sets.”

Navigation/Findability: This site is easy to navigate. Users can identify content with general search terms and can filter by grade or subject area, or by resource type. The average time it took to find a quality resource was about 30 seconds using a keyword search. The content is aimed at teachers preparing for demonstrable lessons. Specific applications, such as Adobe Flash, are needed to view certain content.

Content Assets: There are over 100,000 resources from the combined collections of the Minneapolis Institute of the Arts and the Walker Art Center in Art Finder—the tool that they have designed for exploration of their site. Users can save and customize items they find in the Art Collector—another tool they have for curating and customizing resources. Users can comment, tag, and rate all resources. The site includes lesson plans, music, videos, and sound clips, and the content can be tailored to the user (a “related resources” section is offered). Users
can use Art Collector for the storage of interesting content. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. A community space for discussion is also available. Images, videos, and other viewable content are accompanied by detailed metadata to assist teachers in analyzing the resource. The images are high resolution, in linear view, and the user can preview images or resources before accessing them.

**Lesson Building Tools:** Lesson building tools accompany the resources that can be used to create a lesson. These tools allow the user to connect or group resources according to their own logic, then save and/or share what they’ve done as a set. Users cannot utilize existing social media profiles to create a profile or page on the site, but they can connect to ArtConnectEd’s Facebook page for updates to the site.

**The Kennedy Center, ArtsEdge:** [http://artsedge.kennedy-center.org/educators/lessons](http://artsedge.kennedy-center.org/educators/lessons)

ArtsEdge is an online collection of free, digital arts-centered resources, provided by the Kennedy Center and Verizon Thinkfinity. It is intended to reach schools, communities, and families with printed materials, classroom support, and Internet resources. This site provides many resources, specifically lessons, activities, projects, how-to’s, and guides. The content is designed to be used by teachers preparing lessons.

**Navigation/Findability:** This site is easy to navigate. The average time it took to find a quality resource was about 15 seconds; the reviewer easily found authentic Civil War letters. Users have the option to register. Specific applications are needed to view content. Users are able to find content with general search terms and can filter through a taxonomy of provided terms, by grade or subject area, by resource type, or by standard.

**Content Assets:** A fully updated digital library of arts-centered interactive resources is provided, including lesson plans and interactives for students and teachers. Content is hyperlinked to state standards, and a list is provided on the resource page. Users can create profiles and customize pages for the storage of content of interest, and can they save content to a file on the site, within MyArtsEdge. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The ability to build a lesson is present. As for presentation, images, videos, and other viewable content are accompanied by detailed metadata to make them immediately available. The images are high resolution and listed in a linear view, and the user can preview images or resources before accessing them.

**Lesson Building and Sharing Tools:** Tools accompany the resources that could be used to create a lesson, such as graphic organizers, vocabulary lists, discussion questions, timelines, tests, and quizzes. There are tools or functions available to help the user assess the learning outcomes of their lessons, but there aren’t tools that allow the user to connect or group resources according to their own logic. Additionally, there are embedded tools that provided the users a few ways to share the results of what they found and/or their information with other users on the site, other colleagues off the site, or other user communities that the user might belong to.
ArtNC: http://artnc.org
ArtNC is an educational resource site provided by the North Carolina Museum of Art, designed for educators, students, and others interested in learning from works of art. The site ties together works of art and “Big Picture Concepts” (abstract ideas that relate art to their historical contexts) like conflict, communication, family, or identity. ArtNC and the Big Picture Enrichment Program are supported by the North Carolina GlaxoSmithKline Foundation for the Advancement of Education, Science, and Health.

Navigation/Findability: This site has an intuitive interface. Content is findable with general search terms and can be filtered by grade, subject area, or state standard. Content is designed for teacher lesson preparation. Specific applications aren’t needed to view content, but it is recommended that the user’s browser be a newer version. The average time it took to find a quality resource was approximately one minute.

Content Assets: It appears that around 150 teachable objects from the North Carolina Museum of Art collection are chosen as the source set for this site. Fully constructed lesson plans are offered, and state standards are listed on the resource page for each. Users can create portfolios for the storage of content of interest, and can save content to a file on the site. They can also personalize the resources they find to meet the needs of the students. Users can comment on but not rate a resource. A community space for discussion is available through an on-site blog. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. Images, videos, and other viewable content are accompanied by detailed metadata to make them easy to analyze. The images are high resolution and can be viewed in a linear list or grid view. The user can preview thumbnails of resources before accessing them.

Lesson Building and Sharing Tools: Users can locate an image of a work of art and design a lesson around it by uploading and saving their own documents. Some resources come with associated tools, such as graphic organizers, vocabulary lists, discussion questions, and timelines. Additionally, there are embedded tools that offer users a way to share the results of what they found and/or their information with other users on the site, other colleagues off the site, or other user communities.

This is a sub site of the museum’s main site, linked to and from the homepage. The sub site “Teacher Programs” provides teachers with a variety of programs, workshops, resources (including lesson plans) and classes. This site enables teachers to plan their lesson based on works of art from the Museum’s collections.

Navigation/Findability: Because of its less-than-obvious location from the main site, this site is somewhat difficult to find. Navigation of the site is not as highly developed as we’ve seen in other sites. The average time it took to find a specific resource is over two minutes. There is no search box; instead, two drop-down menus are present. One is for the “Primary Curricular Area”
and the other is for the Academic Arts Standard. This makes searching for a particular piece difficult, but it is convenient for the teacher who is looking to master a standard. Users have the option to register. The content is meant to be interpreted by the teacher for the student. Specific applications are not needed to view content.

**Content Assets:** Twenty-one lesson plans are the main digital assets provided, and each one links to an average of 4 or 5 works of art. Online lesson plans can be modified for a variety of classroom situations, and ideas for assignments, further enrichment, comprehension, and discussion are included. Content is hyperlinked to state standards, which are listed on the resource page. Users can create profiles and customize pages for the storage of content of interest, and can save content to a file (or gallery) on the site. Users can add social tags but cannot rate a resource. Images, videos, and other viewable content are high quality and accompanied by appropriate metadata to assist teachers in their analysis of the resource before selecting it. Images are in a linear list view.

**Lesson Building and Sharing Tools:** Within “MyMuseum,” the user can adapt resources and combine them with others (such as vocabulary lists, discussion questions, and assessment ideas) to create a lesson. There are tools that allow the user to connect or group resources according to their own logic. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. There are teaching kits and posters that are commercialized for sale.

**New York Public Library:** [http://www.nypl.org/events/teaching-learning/tools](http://www.nypl.org/events/teaching-learning/tools)

This is a sub site of the main NYPL website. It is found through a series of links and contains many different tools for teaching, including curriculum resources, over 700,000 searchable images, maps, and documents, theme-based interactive slide shows, online exhibitions, journals, and resources for both teachers and students. It is provided by the New York Public Library’s Division of Teaching and Learning and in addition to the aforementioned resources, it offers programs and services that connect teachers and students to its resources. The Carroll and Milton Petrie Foundation also supports the Teaching and Learning Programs at NYPL.

**Navigation/Findability:** This site provides web-only presentations based on its collections. The site is fairly easy to navigate. Content is hyperlinked on the pages within the sub site and there are some descriptions that teachers can use to identify the resource. The average time it took to find a quality resource was a little over 30 seconds, if one follows a logical series of links. Users have the option to register. It is difficult to search for specific resources in the sub site, but one can use the main site’s search box to locate books, music, movies, and other resources from the NYPL.

**Content Assets:** Primary source materials are available. The sub site contains specific, curated curricula and resource packets for use by teachers. Lesson plans, interactive modules, music, sound clips, and video are included, but the content cannot be adapted or modified online. Images, videos, and other viewable content are accompanied by appropriate metadata to make them easy to analyze. The images that are present are high resolution and embedded within the
text, but the user cannot preview most resources before accessing them. In fact, most resource packets and curricula need to be downloaded to the user’s computer before they are viewable.

Lesson Building and Sharing Tools: Tools do not accompany the resources that can be used to create a lesson, but some graphic organizers and discussion questions are available. There are limited tools that can be used to modify or assess a lesson. Additionally, there are embedded tools that provide users a way to share the results of what they found and/or their information with other users on the site, other colleagues off the site, or other user communities.

Tenement Museum: [http://tenement.org/education_lessonplans.html](http://tenement.org/education_lessonplans.html)
This is a sub site, found within the Tenement Museum’s main site. The materials presented can enrich a visit to the museum, but can also be used to simply teach about immigration in the classroom setting. The resources are limited and provided by the museum staff. There are activities, primary documents, and lesson plans available, as well as several activities geared specifically towards English for Speakers of Other Languages (ESOL) students.

Navigation/Findability: This site is not easy to navigate. The average time it took to find a quality resource was over a minute. Users can filter by subject but no search box is provided for general searches. Instead, there is one page where all resources are located. However, they are presented clearly and images are easy to view and scroll through.

Content Assets: It appears that 8 primary source materials, such as a report card, a census, a death certificate, etc. are available. The site includes lesson plans that are broken down by grade level, interactive modules that can be done with or without a teacher, and videos that can be shown in class or viewed by a student at home. Images, videos, and other viewable content are accompanied by appropriate metadata to make them easy to analyze. English Language Learner resources, called “Shared Journeys,” are provided. This is a series of six educational workshops for adult ESOL classes. Each includes a tour of a restored apartment, and a discussion about the connections between immigration experiences of the past and the present. It is a free program. There is also a high school version of Shared Journeys. All of the workshops are in-person workshops and cannot be completed online. The image files are of high resolution, in linear view, and the user can preview the resources before accessing them.

Lesson Building and Sharing Tools: Tools did accompany the resources that could be used to create a lesson, such as discussion questions and tests/quizzes. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks.

The British Museum Young Explorers: [http://www.britishmuseum.org/explore/young_explorers1.aspx](http://www.britishmuseum.org/explore/young_explorers1.aspx)
This is a sub site within the British Museum’s main site, specifically geared towards students, which allows students to create, play, and discover online through videos, games, and activities.
Navigating Young Explorers offers online tours of different countries through resources within their museum collections. The children’s site is moderately simple to navigate, provides public access, and the teacher or the student can interpret the content. Specific applications are needed to view content. There are language translations (Chinese and Arabic). Users are able to find content with general search terms but cannot filter the results. The average time it took to find a quality resource was approximately 15 seconds.

*Content Assets:* Over 2 million primary source materials are available (all resources are museum objects) for search from the main Museum site. Within Young Explorers, interactive modules, games, and a video and audio channel are provided. Students can explore over 500 museum objects, and virtual museum space is provided through the aforementioned online resource tours. Images, videos, and other viewable content are accompanied by appropriate metadata to make them easy to analyze. The images are high resolution, and the user can preview images or resources before accessing them.

*Lesson Building and Sharing Tools:* There are no tools provided that can be used to share, create, or assess a lesson. Sharing is possible through embedded tools that allow the user to print or email the link.

**Beyond the Chalkboard, Boston Children’s Museum:** [http://www.beyondthechalkboard.com/](http://www.beyondthechalkboard.com/)
This site provides curriculum that covers a wide range of subjects, promotes critical thinking skills, and collaboration between peers. It is designed and written by staff at the Boston Children’s Museum and is funded by the Nellie Mae Education Foundation, an Anonymous Foundation, and through World Cup Boston 2010. The activities provided are intended for afterschool environments, and follow a four-part basic format: “make it matter,” “make it happen,” “make it click,” and “make it better.” The curriculum is designed for teachers, parents, and students.

*Navigation/Findability:* This site is relatively simple to navigate, providing simple search functions. The average time it took to find a specific resource was over two minutes, since the site doesn’t focus on particular concepts like the Civil War. Instead, through a general keyword search box, or through an advanced search function that includes filters, users are able to find content filtered by grade, subject area, or resource type. Registration on the site is optional.

*Content Assets:* Each lesson plan has a materials list, the directions for the four-part basic structure, and any supplemental materials needed (like short stories, images, or other resources). Sharing is possible through emailing the link or through social media.

*Lesson Building and Sharing Tools:* There are tools or functions available to help users assess the learning outcomes of their lessons, but there are no tools that allow the user to connect or group resources according to their own logic. A community space for discussion is available. Additionally, there are embedded tools that provide the users a way to share the results of what they found and/or their information with other users on the site, other colleagues off the site, or other user communities.
Museum of Fine Arts, Boston:  http://educators.mfa.org/home

Designed for educator use, the Educators Online site of the Museum of Fine Arts, Boston, allows users to create an account, collect their favorite resources, make galleries and lesson plans, and build a virtual classroom to share with students.

Navigation/Findability: This site is fairly easy to navigate. The average time it took to find a quality resource was around 30 seconds, through a keyword search, and then through refining filters that sort by best match, grade level, or subject. Users have the option to register in order to save their own galleries.

Content Assets: This site draws from more than 150,000 museum objects that can be saved to online galleries and then shared with students. It includes interactive modules and games. Images, videos, and other viewable content are accompanied by appropriate metadata to make them easy to assess for classroom use. The images are high resolution, in sliding horizontal view and in a linear grid view, and the user can preview images or resources before accessing them. Users can create and share their own gallery, search other teachers’ galleries, or use a gallery that is already created by museum staff. Users can create multimedia classroom assignments, add comments, questions, activity suggestions, build lesson plans, and add their own images of student work to their gallery.

Lesson Building and Sharing Tools: There are tools that allow the user to connect or group resources according to their own logic, and then create a gallery to share with other users. A community space for discussion is available. Sharing is possible through embedded tools that allow the user to email or share with other logged-in users. Users can also upload student responses to the artwork to share with parents or other educators.

American Museum of Natural History:  http://www.amnh.org/ology

Ology is a site provided by the American Museum of Natural History for students in elementary and middle school. It is intended for student use and contains content in seven different sciences (or ‘ologies’), archeology and astronomy being two examples. There are educator guides for instructors, and kids can explore the website independently. The initial development of the site was funded by The Louis Calder Foundation, and the ‘After-School Educator’s Guide to Ology’ is supported by The Charles Evans Hughes Memorial Foundation, Inc.

Navigation/Findability: This kid-friendly site is easy to navigate and provides public and personalized access. Users are able to find content with general search terms and can filter by “ology” (i.e. arche-) or by subject. An educator can sort by grade, title, type, and topic through an index provided. The average time it took to find a quality resource was over two minutes; a general search is less productive than going through the “ology” search feature. The site is somewhat cluttered, but visually appealing for the intended 7-12-year-old age range.

Content Assets: The site includes interactive modules, games, sound clips and other resources made available from the Museum’s over 32 million specimens and cultural artifacts, curated by the museum’s staff. Teachers or students can print materials from the site. As for presentation,
images, videos, and other viewable content are accompanied by appropriate metadata to make them immediately available. The images are high resolution, and the user can preview images or resources before accessing them.

**Lesson Building and Sharing Tools:** This site is designed for direct student engagement and interaction. There are no tools for teachers to create, modify, or assess a lesson.


*This site is designed for educators. It contains an image library, lesson plans, and a student art gallery. It is supported by the Institute of Museum and Library Services.*

**Navigation/Findability:** The site is relatively easy to navigate. The average time it took to find a quality resource was a little over one minute. Users are able to find content through pull-down searches within the libraries/lesson plans page. More content can be found on the MFAH main webpage, and can be filtered by grade, subject area, or resource type. Users have the option to register.

**Content Assets:** Each image available is part of the museum’s collection, though not all are available to view at the museum at any given time. The site includes lesson plans for all grade levels, an image gallery (searchable by time period and culture), and a student art gallery that displays student artwork created in conjunction with lesson plans. Student and teacher comments accompany the artwork. Images, videos, and other viewable content within the image library are not accompanied by appropriate metadata to make them easy to assess for classroom use; the user must select and open the image to view additional information. The thumbnail images are high resolution and are grouped in a linear grid view.

**Lesson Building and Sharing Tools:** Tools accompanying the resources can be used to create a lesson, such as vocabulary lists and discussion questions. Related lesson plans are listed within the information on the piece.

**Library of Congress:** [http://www.loc.gov/teachers/](http://www.loc.gov/teachers/)

*This is a sub site off the main Library of Congress website. It provides classroom materials and professional development to help teachers use primary sources from the Library’s digital collections. The Library of Congress Educational Outreach division generates some of the resources. Along with online modules and teacher guides, the Library of Congress also offers workshops, videoconference training and summer teaching institutes for teachers as part of their professional development offerings through this site.*

**Navigation/Findability:** This site is easy to navigate. The average time it took to find a quality resource was about 30 seconds during which a state standards search was performed. Users are able to find content with general search terms and can filter by state standard, grade, or subject area. Registration is an option but not required.

**Content Assets:** Primary source materials, culled from the Library’s digital collections, are
available. The site includes lesson plans, themed resources, primary source sets, presentations, and activities. Collection connections are provided. Content is hyperlinked to state standards and can be selected through drop-down search menus. Images, videos, and other viewable content are accompanied by appropriate metadata or descriptions to make them easy to assess for classroom use.

Lesson Building and Sharing Tools: All lessons are pre-packaged with no tools for adaptation. There are directions available to help teachers assess the learning outcomes of their lessons. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks.

TATE: http://www.tate.org.uk/learn/online-resources
This website is provided by the TATE Museums for the educator. This sub site offers a wide range of free, online resources for teachers of varying grade levels. The resources can be used as activities in the classroom. A separate site, TATE kids, is also available for a student audience.

Navigation/Findability: This site is difficult to navigate. The average time it took to find a quality resource was over one minute. All content is viewable by the public and no registration is required or available. Accommodations are provided for handicapped/learning-disabled users. Users are very limited when searching with general search terms but can filter by grade, subject area, or resource type.

Content Assets: Primary source materials from the Museums’ collections are available. The site includes lesson plans, interactive modules, web quests, videos, blogs, and games. Lesson plans include discussion questions, all required primary sources, links to additional resources, and ideas for extending understanding. Images, videos, and other viewable content are accompanied by appropriate description or metadata to make them easy to assess for classroom use. The images are high resolution, in linear list view, and the user can preview images or resources before accessing them.

Lesson Building and Sharing Tools: There are no tools provided for teachers to create, modify, or assess the lesson plan, or group results. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks.

General Education Sites

PBS Learning: http://ca.pbslearningmedia.org/
Intended for use by educators, this site is provided by the PBS and WGBH Educational Foundation, and offers tens of thousands of classroom-ready digital resources, including videos, lesson plans, audio, photos, and interactive modules geared towards an Interactive Whiteboard.

Navigation/Findability: This site provides public and personalized access and allows the user the ability to set up a focused class portal. There is some content available in other languages. The user is able to find content with general search terms and can filter by grade or subject area and
resource type. The researcher was able to gain access to 53 Civil War resources, and it was easy to find primary sources, photos and documents among the resources.

Content Assets: Available primary source materials are culled from multiple collections, including but not limited to American Experience, The Library of Congress, the National Archives, PBS News Hour, and NOVA. The site included lesson plans, interactive modules, photos, audio, and videos. Content is hyperlinked to state standards, but this feature is limited. Users can comment on and “like” a resource. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The ability to build a lesson is present through the class portal. Presentations, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available, without accessing the resource. The images are high resolution and in linear view, but the user cannot preview images or resources before accessing them (thumbnails are stock images).

Lesson Building and Sharing Tools: Tools did accompany the resources that could be used to create a lesson. Users can utilize existing social media profiles to create a profile. There are also tools that allowed the user to connect or group resources according to their own logic.

TED-Ed: [http://ed.ted.com](http://ed.ted.com)
This site is provided by the TED organization. It offers a growing video library, carefully curated, and enables users to create a customized lesson around the video, which can then be distributed publically or privately. Partners of the site include Kohl’s Cares and YouTube. Notable advisors include Sir Ken Robinson, Melinda French Gates, and Salman Kahn (founder of the Khan Academy, also reviewed in this report).

Navigation/Findability: This site provided public and personalized access, and the user has the ability to set up focused areas/portals through log-in. There is the ability to share developed activities with students through a personalized URL. Language translations are available. The user is able to find content with general search terms and can filter by subject area. Finding a quality resource was difficult for the researcher because the site does not currently contain Civil War Resources. A teacher would need to find a video from YouTube and import it.

Content Assets: The videos that are provided are possible through pairings of educators and animators, to produce a new library of educational videos. The providers expect the user community to nominate other teachers and animators to generate further content. The site included lesson plans, interactive modules, and video. Users can create profiles and customize pages for the storage of content of interest. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The ability to build a lesson is present. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available; teachers can input their own “Building Context/Introduction for Videos.” The images are high resolution, in sliding horizontal view, and the user can preview images or resources before accessing them.
Lesson Building and Sharing Tools: Many tools accompanied the resources that could be used to create a lesson, and could be added in the Think/Dig Deep lesson areas. There are tools or functions available to help the user assess the learning outcomes of their lessons (student assessment results could be stored in the system), and there are tools that allowed the user to connect or group resources according to their own logic.

Khan Academy: http://www.khanacademy.org/  
This site is provided by the Khan Academy organization and offers free access to content to any user—either teacher or student. The content is comprised of videos, interactive challenges, and assessments that can be made visible to coaches, parents, and teachers for review.

Navigation/Findability: This site provides visitor and free log-in access. Coaches can set up lists to monitor student progress. There are accommodations for handicapped/learning-disabled students, through closed captioning support. The user is able to find content with general search terms. The site contained 1 video with reference to the Civil War. It was very easy to navigate by subject area or standard. The resource was text-heavy but overall seamless.

Content Assets: The site included over 3,200 educational videos and boasts over 168,402,186 lessons delivered (this information is updated as the page is refreshed). Content is from several subject areas, though the focus at the time is on math. Other subjects include biology, chemistry, physics, finance, and history. Users can create profiles and customize pages for the storage of content of interest. Users can comment on a resource. Sharing is possible through embedded tools that allow the user to email, or share to Facebook, Twitter, or other social networks. As for presentation, images, videos, and other viewable content aren’t accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, in both sliding horizontal and linear list view, and the user can preview images or resources before accessing them. Additionally, badges are awarded to users for challenges accomplished to encourage further use and ultimately, understanding of concepts.

Lesson Building and Sharing Tools: Some practice questions are included for math, some History videos contained timelines as part of the lesson, and some tests/quizzes are available in math. There are tools to monitor student visits and media observed. For the user, instant at-a-glance stats are available, as well as a knowledge map of concepts, skills, and challenges. Teachers and coaches can access student data through summaries of class performance or they can hone in on a particular student to get personalized data.

National Geographic: http://education.nationalgeographic.com/education/?ar_a=1  
This site is a product of the National Geographic Society’s National Geographic Education sector. They provide teaching resources, mapping tools, multimedia presentations, a reference and news section, the promotion of “Geo-literacy,” and education programs for both educators and learners. The NG website is funded in part by Thinkfinity Verizon.

Navigation/Findability: This site is extremely easy to navigate, provides public access, and organizes the content by appropriate audience (teacher, student, etc.). The user is able to find
content with general search terms and can filter by grade or subject area, or by resource type. When looking for a resource, the researcher found that the site contains multiple Civil War resources in a variety of formats. The layout is very student-friendly with vocabulary lists, glossaries, encyclopedia look-ups, and a “More to do with this resource” function. The navigation is easy and the search results designated the appropriate audience (i.e. teachers, students, families), which is very useful.

**Content Assets**: Content is provided by the National Geographic Society and is very limited at this time. There is a large focus on geography and mapping, and the collection is still in beta testing. Users can create profiles and customize pages for the storage of interesting content. Sharing is possible through embedded tools that allow the user to email or share to Facebook, Twitter, or other social networks. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available, such as “find more resources,” vocabulary lists, background articles, glossary of terms, encyclopedia side bars, etc. The images are high resolution, some in an horizontal view slideshow, and the user can preview images or resources before accessing them, and the thumbnails include highlights and tags.

**Lesson Building and Sharing Tools**: Provided activities contained pre-created sets of supplemental materials, such as vocabulary lists, related articles, and games. The lessons cannot be modified online, but the resources are optional. Tools are present on the activity page for reference (Encyclopedia Quick Find), finding more related resources, and doing more with a specific resource. There is also a Glossary Quick Find tool. Additional references are listed at the bottom of the activity page.

**The Jason Project**: [http://www.jason.org](http://www.jason.org)

*This site boasts the ability to connect students with scientists and researchers in real-time in order to provide enriching science learning experiences. Standards-based curricula are developed with NOAA, the National Geographic Society, NASA, and others. It was founded by Dr. Robert D. Ballard and is a nonprofit organization managed by Sea Research Foundation, Inc. and governed by Sea Research and the National Geographic Society.*

**Navigation/Findability**: This site provides visitor access, as well as a free log-in feature for full access. The user has the ability to set up focus areas or portals. The user is able to find content with general search terms and can filter by grade or subject area, Common Core or state standards, and by resource type. The search feature is simple to navigate.

**Content Assets**: Primary source materials from partners, such as photos, digital labs, and walk throughs are available. The site included lesson plans, interactive modules, digital labs and games, sound clips, and videos. Content is hyperlinked to state standards, through drop down lists with curricula and activities assigned to each. Virtual museum space is provided. Users can create profiles and customize pages for the storage of interesting content. Users can comment on a resource through journaling. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or
metadata to make them immediately available. The images are high resolution and are in linear view.

*Lesson Building and Sharing Tools:* Tools did accompany the resources that could be used to supplement a lesson, such as journals, graphic organizers, vocabulary lists, discussion questions, and tests and quizzes. There are tools or functions available to help the user assess the learning outcomes of their lessons. The ability to actually build a lesson isn’t present, since curricula are pre-built.

**Thinkfinity.org:** [http://www.thinkfinity.org/](http://www.thinkfinity.org/)

This site provides thousands of free lesson plans and educational resources for teachers. Funded by the Verizon Foundation, the creators of the site had many partners, including but not limited to National Geographic Education, readwritethink, ArtsEdge, and Smithsonian’s History Explorer. Affiliates include ITSE and SETDA.

**Navigation/Findability:** This site is difficult to navigate through the search features, and provides free log-in access. The user is able to find content with general search terms and can filter by grade or subject area, Common Core standards, and by resource type. While searching for a specific source, the researcher found that the site contains access to 247 Civil War resources. What makes the interface difficult to use is the fact that the user is directed out to third party sites that host each of the resources. Users must then navigate back to ThinkFinity to continue to search for resources.

**Content Assets:** Thousands of primary source materials from a variety of contributors are available. The site includes lesson plans, interactive modules, games, podcasts, and videos. Content is hyperlinked to state standards. Users can create profiles and customize pages for the storage of interesting content. A community space for discussion is available. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. At-home activities for students and parents are available, as well as professional development training for educators to learn how to incorporate thinkfinity.org effectively in their own teaching.

*Lesson Building and Sharing Tools:* Limited tools are available. Users could potentially use the polling feature for lesson assessment, or tags to group favorite resources. Some resources are available that would interact with a classroom whiteboard.


Gooru alpha is the first version of this resource and is under active development. The site is a search engine that allows the educator user to access over 2,600 standards-aligned study guides. Fifth through twelfth grade math and science topics are covered, through resources such as digital textbooks, animations, and instructor videos. Through Open Educational Resources, or OER, all content is free to access.

**Navigation/Findability:** This site provides visitor or log-in access. The user is able to find
content with general search terms and can filter by grade or subject area. In the process of doing a specific search, the researcher found that the site does not contain Civil War resources. However, the site is very easy to navigate and had a clear plan for teacher implementation. The site’s usefulness depended on how many teachers actually upload and adopt videos into the library.

**Content Assets:** The materials provided on the site are from all over the web, and are curated by Gooru staff. Some providers are OER commons, ck-12, the Khan Academy, PBS, BBC, Discovery Education, McGraw Hill, and Pearson Education, among others. The way that content is selected and organized can be viewed here: [http://www.goorulearning.org/downloads/GooruContent.pdf](http://www.goorulearning.org/downloads/GooruContent.pdf). The site includes lesson plans and interactive modules. Content focuses on science and math, and is hyperlinked to state standards, or to Common Core standards through the tagging feature. Users can create profiles and customize pages for the storage of interesting content. Users can comment on or rate a resource. As for presentation, the images are high resolution, in various viewing formats, and the user can preview images or resources before accessing them.

**Lesson Building and Sharing Tools:** Tools are limited, as the site is still in development. Some tests and quizzes are available to assess the learning outcomes. There are available lessons and resources that interact with a classroom whiteboard.

**OERCommons:** [http://www.oercommons.org/](http://www.oercommons.org/)

OER Commons is a free, openly licensed site with over 34,000 resources geared towards K-12 and college students. It is a project of ISKME, and is designed primarily for educators.

**Navigation/Findability:** This site is easy to navigate, and provides public and personalized access (which enables the user to create a favorites portal). The user is able to find content with general search terms and can filter by tag, grade/subject area, or resource type. While performing a specific search, the researcher found that the site contains 301 Civil War resources, most of which are readings and syllabi for secondary classrooms.

**Content Assets:** The site includes lesson plans, interactive modules, games, sound clips, and video. Users can contribute materials. Some resources are tagged “remix and share,” enabling tailoring of content. Content is hyperlinked to state standards, and to Common Core standards if the user is logged in under full access. Users can create profiles and customize pages for the storage of interesting content. Users can comment on and rate a resource. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The ability to build a lesson is present. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, in various viewing formats, and the user can preview images or resources before accessing them. After the user clicks on the search result, the user is taken to a site within OER to preview the resource. The user can then choose to be taken to a third party site to directly access the resource.

**Lesson Building and Sharing Tools:** Tools accompany the resources that can be used to create a
lesson, such as graphic organizers, vocabulary lists, discussion questions, and tests and quizzes. Another tool that is present is a bookmark button that, when dragged to the browser favorites bar, can be used to submit a link to be included from the web. With Open Author, users can publish lesson plans, activities, and courses, tag their resources with Common Core or state standards, and create resources that adapt to learner needs and preferences. The user can also print and download their resources as a PDF, and share them with colleagues.


*This site was founded by a group of teachers to connect educators and help them create, organize, and share their curricula. It offers lesson plans, classroom materials, and instructional resources from teachers.*

*Navigation/Findability:* This site provides free log-in access that enables the user to create a class with folders for organization. The user is able to find content with general search terms and can filter by grade or subject area, or by resource type. In performing a search for a specific resource, the researcher found that the site contains access to 12,000+ Civil War resources, mostly lesson plans and files uploaded by other teachers.

*Content Assets:* The site includes over 300,000 files uploaded by teachers that included lesson plans, sound clips, and videos. The user can tailor content if the original resource was created in Word and uploaded as that file. Users can create profiles and customize pages for the storage of content of interest. Users can “recommend” a resource to others. Sharing is possible through embedded tools that allow the user to print or email a resource. Presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, and in sliding horizontal view on the homepage. Users can engage with other educators, and comment with constructive feedback on individual lessons. Some resources are available that interact with an interactive whiteboard.

*Lesson Building and Sharing Tools:* Various tools accompany the resources that can be used to create a lesson, such as graphic organizers, vocabulary lists, and discussion questions. There are tools that allowed the user to connect or group resources according to their own logic. Tools also are included to assist the user to upload, organize, and share their own instructional resources.


*This site is a puzzle generation tool for teachers, students, and parents. Users can create and print a variety of puzzles using their own word lists. The site is sponsored by Discovery Education.*

*Navigation/Findability:* This site offers limited visitor access or paid full access. The content can be accessed by teacher, parent, or student. The user is able to find content with general search terms and can filter by grade or subject area, or by resource type. In performing a specific search, the researcher found that the site contains two Civil War resources. One was a worksheet for student use, and the other was a lesson plan for teacher use.
Content Assets: Under guest access, the site includes lesson plans and interactive modules, and in paid access, videos as well. Content is hyperlinked to state standards, under paid access. Users can create profiles and customize pages for the storage of interesting content. Sharing is possible through embedded tools that allow the user to email, or share to Facebook, Twitter, or other social networks. The images are high resolution, and the user can preview images or resources before accessing them.

Lesson Building and Sharing Tools: Tools accompany the resources that can be used to create a lesson, such as graphic organizers, vocabulary lists within lesson plans, discussion questions within lesson plans, and tests and quizzes. Because the main purpose of this site is to generate puzzles, word searches, crosswords, etc., tools are provided to do so using the teacher’s, student’s or parent’s own word lists.

The following sites are additional General Education sites that were examined. They are competitors, but missed the mark of an all-inclusive website that provides quality content and useful tools/features:

National Geographic Little Kids: http://kidsblogs.nationalgeographic.com/littlekids/
This is a site provided by National Geographic Society and is intended for elementary students and their families.

Navigation/Findability: This site is aimed at elementary students, parents and families. It provides visitor access or free full access. The user is able to find content with general search terms and results come back organized by type (filtering is not an option). The researcher found that the site does not contain Civil War resources.

Content Assets: The site included interactive modules, games, music, sound clips, and video. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, in a linear grid view, and the user can preview images or resources before accessing them.

Lesson Building and Sharing Tools: There are no lesson building or sharing tools observed, as this site is aimed at children, not educators.

This site is in blog format and is provided by the New York Times. Set up like a typical news site, it provides teaching and learning materials to educators based on the New York Times content.

Navigation/Findability: This site is difficult to navigate. The Learning Network does provide visitor access. The user is able to find content with general search terms but cannot filter results. While performing a specific search, the researcher discovered that this site is mainly a blog, with some lesson plans and resources. When she clicked the links for different resources, she got error pages. As a researcher, she tried more to access additional resources, without much luck. As a
teacher, she concluded that she would have navigated away immediately without finding the desired information.

Content Assets: Lesson plans, videos, quizzes, word of the day, poetry pairings and more are offered. Users can contribute via a guest blog. Users can comment on a resource through the blog comment space, and sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The images are high resolution, embedded within the text, and the user can preview images or resources before accessing them. The site allows teachers to use or adapt the lessons across subject areas and levels. Students can respond to “Opinion Questions,” take “News Quizzes,” learn the “Word of the Day,” try “Test Yourself” questions, complete a “Fill-In,” or read “Poetry Pairings.”

Lesson Building and Sharing Tools: Some tools accompany the resources that can be used to create a lesson, such as graphic organizers and vocabulary lists. Users can utilize existing social media profiles to create a profile or page.

Curriki: [http://www.curriki.org](http://www.curriki.org)
This is a non-profit site that provides free and open resources to teachers. Users are encouraged to create, share, and find open learning resources that improve student outcomes. All content is licensed under Creative Commons.

Navigation/Findability: This site provides visitor or free full access via log-in. The user has the ability to set up focused areas or portals. Language translations are available, and content is offered in languages other than English. The user is able to find content with general search terms and can filter by grade or subject area or by resource type. While performing a specific search, the researcher found that the site contained 761 Civil War resources, including lesson plans, worksheets, videos, web quests, and units.

Content Assets: The site offers over 40,000 K-12 learning resources and boasts a 250,000+ teacher and learner membership. Content offered includes lesson plans, interactive modules, games, sound clips, and video. Users can create profiles and customize pages for the storage of content of interest. Users can rate a resource; a community space for discussion is available. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. The ability to build a lesson is present. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available.

Lesson Building and Sharing Tools: Various tools accompany the resources that could be used to create a lesson, such as graphic organizers, vocabulary lists, discussion questions, and tests/quizzes. There are tools or functions available to help the user assess the learning outcomes of their lessons. There are some resources that are designed to interact with a classroom whiteboard.

Digital Collection Sites
Europeana Foundation: [http://www.europeana.eu](http://www.europeana.eu)

This site enables users to explore the digital resources of Europe’s museums, libraries, archives, and audio-visual collections. It is a multilingual space where users can access images, texts, sounds, and videos. Around 1500 institutions have contributed to this site, which is co-funded by the European Union.

**Navigation/Findability:** This site is somewhat easy to navigate, provides public and personalized access, and the content is meant to be interpreted by the teacher for the student. There are extensive language translations available via a drop-down menu. The user is able to find content with general search terms and can filter by resource type. The average time it took to find a quality resource was around 30 seconds. The researcher found that it was difficult to find specific information on the American Civil War, considering it is a European site, but countless resources are available for other topics.

**Content Assets:** Primary source materials from over 1500 institutions are available. The site includes interactive modules, music, sound clips, and video. They have a project that encourages members to contribute specific, related content. There is a monthly list of new/updated materials. On the resource page, there is a list of related resources, and users can create profiles and customize pages for the storage of interesting content (myEuropeana). Users can add tags to sort resources and a community space for discussion is available. Sharing is possible through embedded tools that allow the user to print, email, or share to Facebook, Twitter, or other social networks. Images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, in sliding horizontal view, and the user can preview images or resources before accessing them.

**Lesson Building and Sharing Tools:** There are a limited number of tools provided, other than those that allowed the user to connect or group resources according to their own logic. If a user registered, they could save their favorite items and searches, as well as add tags.

Smithsonian Institution Collections: [http://collections.si.edu/](http://collections.si.edu/)

This site, run through the Collections Search Center, contains a metadata index that allows the user to search over 7.7 million catalog records with 568,100 images, video and sound files, electronic journals, and other resources from the Smithsonian’s Museums, archives, and libraries.

**Navigation/Findability:** This site provides visitor and log-in access, and the content is likely geared toward teacher interpretation for the younger student. The intended user could also be at the college level. The user is able to find content with general search terms, and when searching, key terms are automatically provided below. Results can be filtered by grade or subject area (five different types of categories), or by resource type. The average time it took to find a quality resource was around 30 seconds. The researcher was able to find a book reference entitled “Judging Lincoln” in the library catalog of the Smithsonian Institution Libraries. The user would then have to go in and check out the book to access the content.

**Content Assets:** Primary source materials are available from the Smithsonian’s various museums,
archives, and libraries. Users can create profiles and customize pages for the storage of interesting content (in lists). Users can add tags to differentiate resources; a community space for discussion is available through the Smithsonian Collections blog. Sharing is possible through embedded tools that allow the user to print or email. As for presentation, images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, viewable in list, grid, or slideshow format, and the user can preview images or resources before accessing them.

Lesson Building and Sharing Tools: There are tools that allow the user to connect or group resources according to their own logic, and create lists of items that they feel are related. To help the Smithsonian further develop its catalog, users can click a tag button to contribute.

National Gallery of Art, Washington: http://images.nga.gov
This site is a collection of digital images from the National Gallery of Art. The user can search, browse, share, and download images. Collections are prepared by Gallery Curators. Many of the open access images have been digitized with the support of the Samuel H. Kress foundation.

Navigation/Findability: This site is somewhat simple to navigate, provides public access, and the content is meant to be interpreted by the teacher for the student. The user is generally able to find content with general search terms and can filter by artist, title, dates, or school/classification. The average time it took to find a quality resource was less than 30 seconds through a simple keyword search, although only one image/resource was displayed.

Content Assets: Primary source materials, including over 20,000 open access digital images up to 3000 pixels each, are available free of charge for download and use. The site includes images. Users can create a “lightbox,” or personal page, for the storage of content of interest. An option to view related images is provided. The images are high resolution, in linear view, and the user can preview images or resources before accessing them. The user can either enter a search term in the Quick Search box, or they can browse the regularly updated featured-image collections.

Lesson Building and Sharing Tools: Tools don’t accompany the resources that could be used to create a lesson. However, there are tools that allow the user to connect or group resources according to their own logic, in a platform labeled “lightbox.”

Internet Archive: http://archive.org
The Internet Archive is a non-profit organization that was founded to build an online Internet Library. It provides teachers, students, and others with access to historical collections in digital format.

Navigation/Findability: This site is difficult to navigate and very cluttered. It provides public and log-in access, and the content is most likely meant to be interpreted by the teacher for the student. A VLC media player is required to view video. The user is able to find content with general search terms and can filter by resource types. The average time it took to find a quality resource was around 30 seconds. The researcher was able to do a basic keyword search and find
a document from the Library of Congress that addressed the constitutionality of Lincoln’s actions. The site includes specialized services for adaptive reading and information access for the blind and other persons with disabilities.

Content Assets: The site includes texts, moving images, software, music, sound clips, archived web pages and video. Users can contribute materials but need knowledge of programming. Video uploads are not allowed. Users can create profiles to upload content. Users can comment and write a review on a resource; a community space for discussion is available in a forum at the bottom of the homepage. Sharing is possible through embedded tools that allow the user to print or email. Images, videos, and other viewable content are accompanied by appropriate description or metadata to make them immediately available. The images are high resolution, in linear view, and the user can preview images or resources before accessing them.

Lesson Building and Sharing Tools: Accompanying tools are nonexistent, other than those needed to upload or download a resource.
Appendix B

Teacher Search Approach

Teacher Reviewers

Jillian Ryan has taught in the San Diego Unified School District for the past four years as a middle and high school English and social studies teacher. She has also designed and taught classes for the district’s Educational Technology Department. She contributed to the district-designed technology standards, including presenting them to the school board.

Virginia McMunn has served the last 5 years as a middle school social studies teacher at a progressive charter school in the San Fernando Valley area of Los Angeles. As social studies department chair, she has led efforts to redesign the social studies curriculum across two school sites and to develop an organization-wide vision for social studies education.

Griffith Montgomery has supported disadvantaged students and students with disabilities as an Educational Specialist for Aspire East Palo Alto Phoenix Academy for the last four years. He has an M.A. in Special Education. His focus has been helping students to close the achievement gaps in the areas of Literacy and Math within the California A-G framework. He served as site lead in professional development on grading students with disabilities and has worked closely with general education teachers to ensure that they have the skill sets to implement Individual Education Plans (IEP)s in their classrooms when a specialist is not present.

Search Approach

Jillian Ryan selected the topic of the American Civil War through the lens of an 8th grade U.S. History teacher. In choosing this unit, she would be able cover a multitude of topics, among them slavery, abolition, Abraham Lincoln, battle tactics, agriculture and industry, causes and effects of the Civil War, and others. She chose this topic because of its ability to provide multiple paths of information acquisition. She hoped that through her search she would be able to find at least one resource that would be useable for this topic. When she could, she attempted to be as specific as possible, and tried to hone in on the concept of the constitutionality of Abraham Lincoln’s actions during the Civil War. In addition, she tried to maintain a strong correlation to either Common Core or appropriate state standards. For example, if it was a resource site based in New York, she looked for the alignment to New York’s state standards for education.

She used a wireless Internet home connection and a relatively fast computer (2011 MacBook Air). While she searched, she kept a paper copy next to the computer to record her findings of the checklists that follow. She also timed herself to assess how long it took her to find a quality resource that she could focus on for that site. She also looked through two separate perspectives. First, she examined the site through the lens of a technologically-connected teacher and then, as that of a teacher who is not as technologically adept. She made note of what “extra” tools were available, such as sharing or “like” buttons similar to those found on the Facebook and Twitter platforms.
She also noted whether or not the materials were easily accessible and didn’t require a large amount of digital ability. She wanted to see whether the resource was one that required classroom technology in order to be shared with her students, or if it was a resource that she could simply print out and hand to the students. Moreover, she wanted to see if the resource could be posted on her own website for student use. She noted her opinions about each site, and whether or not she found them visually appealing as a teacher and user of the site.

Virginia McMunn used a methodology similar to Jillian’s for analyzing sites. She used a home wireless Internet connection and a 2012 MacBook Pro. Virginia followed Jillian's methodology of searching for resources on the topic of the Civil War. She also adopted Jillian's methodology of using standards strands to search for resources, where applicable. Since Virginia will be teaching 8th grade U.S. History for the first time next year, she was easily able to assume the persona of a teacher looking for Civil War resources to create a new curriculum and lessons for use with students. Like Jillian, Virginia approached each site from the perspective of a technology-advanced teacher, while also looking for the pitfalls that those new technology users or student users might face. Virginia also brought the added perspective of a teacher working in a technology integration classroom, where digital resources are placed in the hands of the students for the purpose of inquiry-driven instruction. Because the process of searching for Civil War resources is authentic to her teaching goals for next year, Virginia often went through the process of setting up an account, creating a personal portal, combining resources into a meaningful lesson and looking for a way to push these resources to her students in a technology integration classroom setting. Like Jillian, Virginia noted different ways to share the resources with her colleagues through Twitter or Facebook. Additionally, Virginia looked for sites that provided accommodations for English Language Learners and other students with Special Needs.

As a special educator, Griffith Montgomery was asked to review sites in a more focused way to address questions of access for struggling students. He reviewed the museum sites using the following protocol:

1. Choose a lesson topic that you might want to teach and enter each site with that same search in mind. You need to approach each site with the same goal in terms of what you are trying to find. After you have found what you were looking for, ask yourself the following questions:
   a. How easy or difficult was it to find what I was looking for? (Time yourself for speed.)
   b. Would this resource work for special education students or struggling learners?
   c. How would it need to be adapted? Can I adapt it on the site easily?
   d. Are there tools that help me customize this to my learners?
   e. What would I need to make this resource more accessible and relevant to my students?

2. Summarize your findings for all the sites in terms of major strengths and weaknesses you saw across the group, examples of excellence, gaps where no one is providing needed tools or resources.
Griffith searched for resources on Japan and the atomic bomb for his 11th Grade U.S. History class for students with an IEP-related to writing. Students were being asked to write an assertion paragraph or create a graphic organizer using complete sentences for the following prompt: Should the United States have dropped the atomic bomb on Japan?
Appendix C

Guidelines for Site Review

The three test-subjects are California teachers. Between the three, the subjects they teach include English, U.S. History, and Special Education. They took a direct, timed approach to search for resources focused on a specific topic with a series of actions that addressed points I-VIII below. The teachers were asked to approach the site generally from a lesson-gathering perspective as if they were initiating a search for instructional materials for classroom implementation. As such, they utilized the search functions within each site reviewed and used those tools and features made available to find a resource on a specific, consistent topic. When a viable resource was found, it was explored and documented per anticipated classroom implementation. If one was not identified, the researcher was instructed to modify their search to find a topically related resource of “best fit.” Given a series of instructionally related, viable resources surfaced from each site, the teacher-researchers processed their collections through points I-VIII below as a summative assessment of the site. The charts were used as a checklist (see below). A more detailed explanation of the search processes and documentation approaches are included in Appendix B.

Features Check List and Questions

I. Technology and Design
   a. To/For whom is the site designed primarily?
   b. How is access granted and to whom? Can you get temporary access as a visitor in order to view the site?
   c. Can groups set up focused portals/areas on the site?
   d. Is high-speed Internet service required?
   e. Is a specific browser required to view content?
   f. Is a specific program application required to view certain content (i.e. Adobe, Flash, QuickTime, etc.).
   g. Are there language translations available?
   h. Are there accommodations for handicapped or learning disabled users?
   i. Does the site offer content in languages other than English?

II. Searchability/Findability - What are the primary ways a user can search for resources on this site?
   a. Are you able to find what you are looking for with general search terms?
   b. Is there a taxonomy of terms already provided for browsing?
   c. Can you filter by grade or subject area?
   d. Can you filter by Common Core standard?
   e. Can you filter by resource type?

III. Content Assets - What types of assets are available on the site?
a. primary source materials
b. lesson plans
c. interactive modules
d. games
e. music
f. sounds clips
g. videos
h. Is the site focused around specific topic areas? If so, how were these chosen?
i. Can users contribute materials?
j. How often is the material updated?
k. Is there “real-time” content available? (e.g. Live video feed)
l. Is the content meant to be interpreted or used by specific audiences, such as students or teachers?
m. Can content be tailored to the interests of the registered user? (e.g., “If you liked this, you will also like this…”)

n. Can the user tailor content to fit their needs?
o. Hyperlinked to state standards?
p. If so how? (URL link? Standards referenced in site material?)
q. Partner sites (other museums, organizations?)
r. Are commercially licensed materials used/disseminated via the site? If so, who is the licensor of the material?
s. Virtual museum spaces or tours are provided
t. Can users create profiles and customize pages for the storage of content of interest?

IV. Annotation Capabilities (making connections, interpreting, analyzing): What are the primary tools users can use to share, rate, comment on resources?
   a. Can you comment on a resource?
   b. Can you rate a resource?
   c. Is there a community space for discussion?
   d. Can you share a resource?
   e. What tools are available to share a resource?
   f. Can you print a resource for classroom use?
   g. Can you project on video screen?
   h. Can you save resources to a file on the site?
   i. Can you build a lesson within the site?

V. Presentation:
   a. Are the images (photos, videos, etc.) accompanied by appropriate text to make them immediately usable? (e.g., descriptions surrounding objects are written in age appropriate ways)?
   b. Are images clear and easy to view and read?
   c. Can you “preview” images or resources before accessing them?

VI. Tools and Functions (extracting, integrating, implementing)
a. Are there tools accompanying the resources that were helpful for creating your lesson? For example:

b. graphic organizers
c. vocabulary lists
d. discussion questions
e. timelines
f. Are users able to utilize existing social media profiles to create a profile or page (i.e. Facebook, Twitter)
g. Are there tools or functions available to help one assess the learning outcomes of the lesson?
h. Are there tests or quizzes available?
i. Are there available tools that allowed a user to connect or group resources according to their own logic?
j. Are there available tools that provided users a means to display or render the resources with the intent of demonstrating them to a classroom?
k. Are there available tools that provided users a means to push them onto a student access view page internally or export to an external site or page?
l. Are there any tools that allowed teachers to share the results of what they found and/or their information with other users on the site, other colleagues off the site, other user communities that a teacher might belong to, etc.?
m. Are there available lessons and resources that interact with a classroom whiteboard (SMART board/Promethean/etc.)?

VII. Intellectual Property (IP) and Usage Policy
a. What is the origin of the material?
b. How is new material chosen for the site?
c. How is the material catalogued? (i.e., free vs. purchasable, or other)
d. What is the usage policy for materials on the site?
e. Do individual items have specific use rights or licensing? (i.e. Creative Commons or others)
f. Can materials be altered or adapted?
g. Are any resources, materials or events commercialized for sale?
h. Who is the licensor of the material?

VIII. How is the site promoted?
a. Through links to other organizations or museums?
b. Through commercial advertising?
c. Through live events at the museum?
d. Through sponsored online events (podcasts, webinars, etc.)?
e. Through email or news feeds to users?