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| **GALILEO Guided Research Activities:**  **Lesson Plan** | gal_line_2003_sm |

**Overview**

In this series of activities, students are guided through the research process. Students learn how to develop keywords for conducting research, how to find reliable information in the various resources in GALILEO, how to evaluate the sources they find, and how to cite their sources. The series of activities culminates in a research project, such as a paper, poster, presentation, video, or other object to demonstrate what they have learned.

These activities can be used as a series over the course of a week, a semester, or a grading period. Several of the activities in the series could also be used as an individual assignment without the other activities. All activities can be adapted to differentiate for grade levels and can be used for individual projects or small group assignments.

The purpose of these activities is to help students develop information literacy skills necessary for research that is required in elementary, middle, and high school and into the college or university environment. In keeping with this focus on college readiness, the objectives are aligned with the Common Core Georgia Performance Standards, the American Association of School Librarians Standards for the 21st-Century Learner, and the Association of College and Research Libraries Information Literacy Competency Standards for Higher Education. The list of standards can be found in Appendix A. Objectives and materials are listed with each activity.

The skills that students gain through the activities outlined in this lesson plan are listed in Information Literacy Skills (Appendix A), which was created in 2010 by Nadine Cohen, Instruction Librarian at University of Georgia, who adapted it from *Information Literacy Toolkit: Grades Kindergarten – 6* by Jenny Ryan and Steph Capra and published by the American Library Association. Courtney McGough updated and revised Nadine’s work to reflect the Common Core Georgia Performance Standards and the addition of the AASL and ACRL standards.

**Skill: Choose a Workable Research Topic**

**Objectives**

* Students will be able to develop a research question
* Students will be able to generate ideas for keywords for their topic
* Students will be able to identify the best keywords to use for searching

**Activity: Keyword Brainstorm and Mindmap**

Estimated class time: 25 minutes

As a group, students brainstorm terms, synonyms, and categories to describe a household object as the teacher draws a mindmap for the group. Students then break up into small groups or individuals to brainstorm and map terms, synonyms, and categories for their own research topics.

(Credit: This activity was adapted from a classroom activity developed by Katie McGrath, a Reference/Instruction Librarian at Southern Adventist University.)

**Resources and Materials Needed:**

* Chalkboard/Whiteboard/Flipcharts for group activity
* Paper or computer/laptop with word processing software for student activity
* Mindmapping tool (optional)

**Procedure:**

* Group activity (estimated class time: 10 minutes)
  + Explain that the first step in research is to determine a workable research topic by choosing a topic and brainstorming keywords that they can use for searching
  + Hold up a household object to the class (such as scissors, spool of thread, needle, duct tape, hammer, etc.)
  + Draw a mindmap on the board as you have students:
    - Call out the name of the object
    - List synonyms for that object
    - Come up with the categories in which the item belongs (indicate in the mindmap which are narrower or broader categories)
* Individual/small group activity (estimated class time: 15 minutes)
  + Break students into individuals or into small groups (if a group assignment)
  + Have students write down their topic, brainstorm, and then create a mindmap of their topic, synonyms, and broader/narrower categories; they may need to create more than one mindmap if their research topic has more than one concept (e.g., effect of pollution on birds)
  + Have students keep their mindmap because they will use these in the next activity

**Skill: Find Reliable Information**

**Objectives**

* Students will be able to identify appropriates sources to search for information
* Students will be able to gather relevant information from a variety of digital sources
* Students will understand the different types of information (e.g., text from different types of articles and documents, media in audio and visual forms, etc.)
* Students will understand the difference between primary and secondary sources

**Activity: Guided Exploration of GALILEO resources**

Estimated class time: 25 minutes

The teacher/media specialist explains different types of information (e.g., text from different types of articles and documents, media in audio and visual forms, etc.) and the difference between primary and secondary sources. Using topics generated in the first activity, students are guided through a search of GALILEO resources. (Note that this is a first pass at searching, and the purpose of this activity is for students to learn to navigate online resources and locate items. Students will revisit their list of items in a later activity to determine if additional searching is needed to have appropriate information for their paper/project.)

The GALILEO Guided Research Activities can be found in GALILEO Presentations and Materials (<http://help.galileo.usg.edu/librarians/documents/>):

* GALILEO Guided Research Activity for Elementary <http://about.galileo.usg.edu/docs/materials_docs/GALILEOGuidedResearchElementary.docx>
* GALILEO Guided Research Activity for Middle School <http://about.galileo.usg.edu/docs/materials_docs/GALILEOGuidedResearchMiddleSchool.docx>
* GALILEO Guided Research Activity for High School <http://about.galileo.usg.edu/docs/materials_docs/GALILEOGuidedResearchHighSchool.docx>

**Resources and Materials Needed:**

* Computers/laptops with internet access
* GALILEO resources
* Keywords for their topics

**Procedure:**

* Teacher/media specialist explains different types of information that students can use in their research papers/projects
* Teacher/media specialist explains the difference between primary and secondary sources; for high school students, also discuss the difference between popular and scholarly resources
* Teacher/media specialist discusses the need to save article citations for future use
* As individuals or small groups, have students use the GALILEO Guided Research Activity to find items on their topic
* Students record citations as items are found (these citations will be used in the next activity)
* As students are working, teacher/media specialist assists students and provides search tips as needed
* As students search, they may need to re-evaluate their search terms; teacher/media specialist can assist students with developing new terms if needed

**Notes for Adaptation:**

This activity can be adapted to include print items in the media center as well as other internet sources (e.g., find a print book in the media center; find a website on your topic with a .edu, .org., and/or .gov domain; etc.). Numbers and types of items can be changed to suit grade level or specifics of the assignment (e.g., find literary criticism on your topic, find biography on your subject, etc.).

GALILEO also provides scavenger hunt activities that can be used as a stand-alone activity. They are designed to familiarize teachers and new media specialists with GALILEO resources, and they can be adapted for use with students.

* GALILEO Scavenger Hunt: Elementary <http://about.galileo.usg.edu/docs/materials_docs/ScavengerHuntElementary.doc>
* GALILEO Scavenger Hunt: Middle School <http://about.galileo.usg.edu/docs/materials_docs/ScavengerHuntMiddleSchool.doc>
* GALILEo Scavenger Hunt: High School <http://about.galileo.usg.edu/docs/materials_docs/ScavengerHuntHighSchool.doc>

**Skill: Analyze, Evaluate, and Select Information**

**Objectives**

* Students will be able to evaluate sources based on given criteria
* Students will understand the importance of considering currency, reliability, authority, purpose to evaluate sources

**Activity:**

Estimated class time: 30 minutes

Using list of items gathered in the last activity, students will evaluate each item based on a given list of criteria. There are a few lists of criteria that can be used, but the CRAP Test is a commonly used tool. You can find it with links to related resources at Crap Detection, A 21st Century Literacy, a blog post by Bobbie Newman at Libraries and Transliteracy that discusses the CRAP Test: http://librariesandtransliteracy.wordpress.com/2010/09/16/crap-detection-a-21st-century-literacy/

**Resources and Materials Needed:**

* List of items gathered from GALILEO Guided Research Activity
* Computers/laptops with internet access (to return to the full text of their items)
* GALILEO resources
* List of criteria for evaluation
* Paper or computer/laptop with word processing software for student activity

**Procedure:**

* Teacher/media specialist discussed the importance of evaluating sources that students use in research
* Provide students with a list of criteria to use to evaluate their sources and discuss each one
* Students take list of items gathered from the last activity
* Students will need to find each item to be able to see the full text
* Students record their evaluation of the items they found based on the criteria

**Skill: Organize and Synthesize Information**

**Objectives**

* Students will be able to revise their search to gather additional information if needed
* Students will be able to organize ideas
* Students will cite sources according to a specified style guide
* Students will understand the importance of citing their sources and not plagiarizing the work of others.

**Activity:**

Estimated class time: 20 minutes

Now that students have evaluated the items they found, students can choose which items will be best to include in their project. Students may need to conduct new searches to find more items. Students will create an outline for their research paper and citation list of the items they want to use in their projects. (This list is to be considered a draft. As students begin to work on their projects, they may need to reevaluate their research question or sources.)

**Resources and Materials Needed:**

* Evaluation of items from previous activity
* Computers/laptops with internet access to conduct new searches if needed
* GALILEO resources
* Paper or computer/laptop with word processing software for student activity

**Procedure:**

* Teacher/media specialist explains the importance of citing sources and will discuss the importance of intellectual honesty and not plagiarizing the work of others
* Students will decide which items are appropriate for inclusion in their project
* If they need to find more items or replace items, they can perform new or revised searches
* Based on items to be included in the project, students develop an outline for their project and a list of citations in MLA format (or other format chosen by teacher/media specialist)
* Students will work on the first draft of their papers/projects as homework

**Skill: Create a Project/Evaluate the Research Process**

**Objectives**

* Students will be able to create a written, oral, or visual report that presents a logical sequence of ideas and provides evidence to support those ideas
* Students will be able to assess the quality of their projects
* Students will be able to receive feedback from teacher and peers

**Activity:**

Estimated class time: 3 50-minute periods

Students revise and then create their paper/projects with a final list of citations. Students complete a self-evaluation based on the same rubric that the teacher will use. Students present their projects to the class. Classmates are encouraged to provide constructive feedback on the projects of their peers while the teacher moderates the comments.

**Resources and Materials Needed:**

* Paper or computer/laptop with word processing software for student activity
* Presentation software
* Video/audio editing software
* Other software as needed based on the type of project
* Rubric for assessment
* First draft of their paper/project

**Procedure:**

* Students are given the rubric for assessment
* Students revise their draft as needed and conduct new searches for information if needed
* When they turn in their paper/project, they will also turn in a self-evaluation of their work (using the same rubric the teacher will use to grade it)
* Students will present their projects to other members of the class, and class members will be asked to provide constructive feedback

**Total Estimated Time**  
Five 50-minute class periods

**Assessment / Rubric**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criterion** | **Low Quality** | **Acceptable to Good Quality** | **High Quality** |
| Keyword Brainstorm/Mindmap  10% of total grade | Student made minimal or no contribution to large group or individual/small group activity.  0-3 points | Student contributed 2 to 3 times to large group or individual/small group activity.  4-8 points | Student contributed 4 or more times to large group or individual/small group activity.  9-10 points |
| Resource Exploration  25% of total grade | Student gathered less than 25% of required items, and little or no citation information was recorded.  0-14 points | Student gathered more than 25% of, but not all, required items, and some citation information was recorded.  15-20 points | Student gathered all required items, and all citation information was recorded.  21-25 points |
| Evaluation of Sources  15% of total grade | Student provided accurate evaluation of less than 25% of items.  0-7 points | Student provided accurate evaluation of 25%-90% of items.  8-13 points | Student provided accurate evaluation of 90% of items.  14-15 points |
| Citation List  10% of total grade | Student provided accurate citations for less than 25% of items.  0-7 points | Student provided accurate citations for 25%-90% of items.  8-13 points | Student provided accurate citations for 90% of items.  14-15 points |
| Project  40% of total grade | Project has minimal or no representation of content;  project includes few or inappropriate resources; project demonstrates miminal understanding of the content through analysis and synthesis in words and pictures; project has minimal or no citation information; project makes minimal use of text or digital media with little creativity.  0-29 points | Project has more than 50% representation of content;  project includes some appropriate and some inappropriate resources; project demonstrates understanding of the content through analysis and synthesis in words and pictures; project has some citation information; project makes appropriate use of text or digital media with some creativity.  30-45 points | Project has more than 75% representation of content;  project includes appropriate resources; project demonstrates exceptional understanding of the content through analysis and synthesis in words and pictures; project has complete citation information; project makes exceptional use of text or digital media with great creativity.  46-50 points |
| TOTAL, Overall Grade | 0-69 points | 70-89 | 90-100 |

**Appendix A: Information Literacy Skills**

Created in 2010 by Nadine Cohen, Instruction Librarian at University of Georgia, who adapted it from *Information Literacy Toolkit: Grades Kindergarten – 6* by Jenny Ryan and Steph Capra and published by the American Library Association; updated and revised by Courtney McGough to reflect the Common Core Georgia Performance Standards and the addition of American Association of School Librarians Standards for the 21st-Century Learner and the Association of College and Research Libraries Information Literacy Competency Standards for Higher Education

This outline is not an exhaustive list of skills (or standards), but it provides a summary of skills students develop at various stages of the research process to help in planning activities.

**Choose a Workable Research Topic**

* Uses questioning techniques to clarify and understand a given task, with guidance
* Selects from a range of given topics
* Draws on prior knowledge to brainstorm and cluster ideas with guidance
* Identifies keywords for topic using modeled techniques
* Prepares a simple search plan using keywords and focus questions

***AASL***:

* 1.1.1 Follow an inquiry-based process in seeking knowledge…
* 1.1.3 Develop and refine a range of questions to frame the search…

***ACRL***:

* 1.1 The information literate student defines and articulates the need for information

***Bloom’s Taxonomy***: Remembering, Understanding, Applying, Analyzing, Creating

**Find Reliable Information**

* Identifies likely print and online sources for information, with guidance
* Follows a research plan, modifying it as needed
* Uses library catalog to find material
* Aware of internet search engines and how they differ from GALILEO and other subscription/licensed resources in the library
* Becomes familiar with a variety of GALILEO databases and their value for research
* Uses Boolean AND or OR to narrow or broaden searches
* Refines searches by using narrower and broader terms
* Narrows searches using facets in database (if available)
* Understands that a source can exist in both online and print formats
* Recognizes when currency of information is important
* Recognizes the need to find a variety of viewpoints on a topic
* Understands the difference between primary and secondary sources

***CCGPS***:

* CCW7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
* CCW8: Gather relevant information from multiple print and digital sources
* ELACCXW7/ELACCXWHST7: Conduct research projects…
* ELACCXW8/ELACCXWHST8: …gather information from print and digital sources…
* ELACC3RI5: Use text features and search tools…to locate information relevant to a give topic…

***AASL***:

* 1.1.4 Find…appropriate sources…
* 1.1.8 Demonstrate mastery of technology tools for accessing information and pursuing inquiry
* 1.3.2 Seek divergent perspectives during information gathering and assessment
* 1.3.3 Follow ethical and legal guidelines in gathering and using information
* 1.4.1 Monitor own information-seeking processes for effectiveness and progress and adapt as necessary

***ACRL***:

* 1.2 The information literate student identifies a variety of types and formats of potential sources for information
* 2.1 The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information
* 2.2 The information literate student constructs and implements effectively-designed search strategies
* 2.3 The information literate student retrieves information online or in person using a variety of methods
* 2.4 The information literate student refines the search strategy if necessary

***Bloom’s Taxonomy***: Understanding, Applying

**Analyze, Evaluate, and Select Information**

* Skims table of contents, index, headings, graphs, tables, charts, etc. to select material from a book, article, or website
* Uses a variety of primary and secondary sources
* Compares information from different sources
* Compares the purpose of different writing styles
* Discriminates between fact and opinion
* Understands that events and data can be interpreted in different ways
* Recognizes the need for adequate data before drawing conclusions
* Modifies focus questions as needed using modeled techniques

***CCGPS***:

* CCRR1: Read closely to determine what the text says explicitly and make logical inferences from it
* CCRR2: Determine central ideas or themes of a text
* CCRR7: …evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words
* CCRR8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence
* CCRR10: Read and comprehend complex literary and informational texts independently and proficiently
* CCW8: …assess the credibility and accuracy of each source
* CCRLS2: …evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
* CCRLS3: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric
* ELACCXRI10: …read and comprehend informational texts…
* ELACCXRI7: Interpret information/draw on information from multiple print or digital sources/Integrate multiple sources of information…
* ELACCXSL2: Analyze purpose of information presented in diverse media and formats…and evaluate motives
* ELACCXRH7: …evaluate multiple sources of information…
* ELACCXRST7: …evaluate multiple sources of information…

***AASL***:

* 1.1.4 …evaluate and select appropriate sources…
* 1.1.5 Evaluate information found in selected sources on the basis of accuracy, validity, appropriateness for needs, importance, and social and cultural context
* 1.1.6 Read, view, and listen for information presented in any format…in order to make inferences and gather meaning
* 1.1.7 Make sense of information gathered from diverse sources by identifying misconceptions, main and supporting ideas, conflicting information, and point of view or bias
* 1.2.4 Maintain a critical stance by questioning validity and accuracy of all information
* 1.3.2 Seek divergent perspectives during information gathering and assessment
* 2.1.1 Continue an inquiry-based research process by applying critical thinking skills (analysis, synthesis, evaluation, organization)…

***ACRL***:

* 2.5 The information literate student extracts, records, and manages the information and its sources
* 3.1 The information literate student summarizes the main ideas to be extracted from the information gathered
* 3.2 The information literate student articulates and applies initial criteria for evaluating both the information and its sources
* 3.4 The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information

***Bloom’s Taxonomy***: Understanding, Applying, Analyzing, Evaluating

**Organize and Synthesize Information**

Organize

* Uses a note-taking strategy to record information using modeled examples (i.e., concept maps, outlines, headings, etc.)
* Records bibliographic information for books, articles, and websites
* Understands what plagiarism is and how to avoid it
* Organizes ideas and information logically within a framework of headings and subheadings, chronology, cause/effect, etc. using modeled examples

Synthesize

* Sees connections between similar ideas
* Integrates information gained from search
* Engages in reflective thinking, alone or in a group, to clarify a question or problem
* Recognizes information deficiencies and locates additional information using modeled examples
* Understands the need for sound reasoning when their ideas are challenged
* Develops confidence in making informed opinions

***CCGPS***:

* CCRR1: … cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
* CCRR7: Integrate … content presented in diverse formats and media, including visually and quantitatively, as well as in words
* CCW8: …integrate the information while avoiding plagiarism
* CCRLS2: Integrate … information presented in diverse media and formats, including visually, quantitatively, and orally.
* ELACCXW8/ELACCXWHST8:…take notes and categorize information, provide a list of sources/follow a standard format for citation
* ELACCXRI7: Integrate information presented in different media or formats/Analyze various accounts/Integrate and evaluate multiple sources of information…
* ELACC5RI9: Integrate information from several texts
* ELACCXRH7: Integrate visual information … with other information in print and digital texts
* ELACCXRST7: Integrate quantitative or technical information expressed in words…

***AASL***:

* 1.2.5 Demonstrate adaptability by changing the inquiry focus, questions, resources, or strategies when necessary to achieve success
* 1.3.1 Respect copyright/intellectual property rights of creators and producers
* 1.3.3 Follow ethical and legal guidelines in gathering and using information
* 1.4.3 Monitor gathered information and assess for gaps or weaknesses
* 2.1.1 Continue an inquiry-based research process by applying critical thinking skills (analysis, synthesis, evaluation, organization)…
* 2.1.2 Organize knowledge so that it is useful
* 2.1.4 Use technology and other information tools to …organize knowledge
* 3.1.6 Use information and technology ethically and responsibly

***ACRL***:

* 1.4 The information literate student reevaluates the nature and extent of the information need
* 2.5 The information literate student extracts, records, and manages the information and its sources
* 3.3 The information literate student synthesizes main ideas to construct new concepts
* 5.1 The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology
* 5.2 The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources

***Bloom’s Taxonomy***: Understanding, Analyzing, Evaluating

**Create a Project/Evaluate the Research Process**

Create

* Uses information appropriate to the task and the audience
* Makes simple generalizations and draws simple conclusions
* Creates written, oral, or visual reports that present a logical sequence of ideas using elements such as titles and subtitles, graphs, models, displays, posters, or other pictorial or dramatic presentations
* Creates simple multimedia presentation, including sound, video, and/or graphics
* Develops desktop publishing skills using graphics, borders, and/or clip art

Evaluate

* Assesses the quality and relevance of a project
* Assesses their own involvement in a group project
* Respects the rights and opinions of others
* Give constructive feedback to peers
* Responds constructively to feedback from teacher and peers
* Uses evaluative strategies like rubrics, reflective journals, etc.
* Identifies questions and issues arising from feedback
* Acknowledges personal and group achievements

***CCGPS***:

* CCW1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence
* CCW2: Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content
* CCW4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
* CCW5: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach
* CCW6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others
* CCW9: Draw evidence from literary or informational texts to support analysis, reflection, and research
* CCW10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences
* CCRLS4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience
* CCRLS5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations
* ELACCXW1-3/ELACCXWHST1-3: Write opinion pieces, informative/explanatory texts, narratives, arguments
* ELACCXW4-6/ELACCXWHST4-6: …produce writing, develop and strengthen writing, use technology to produce and publish writing…
* ELACCXW9/ELACCXWHST9: Draw evidence from literary or informational texts…
* ELACCXW10/ELACCXWHST10: Write routinely…
* ELACCXSL4: Report on a topic/Present claims and findings/Present information, findings, and supporting evidence…
* ELACCXSL5: Create recordings/visual displays/Include multimedia components/Integrate multimedia and visual displays/Make strategic use of digital media…

***AASL***:

* 1.2.3 Demonstrate creativity by using multiple resources and formats
* 2.1.6 Use the writing process, media and visual literacy, and technology skills to create products that express new understandings
* 3.1.1 Conclude an inquiry-based research process by sharing new understandings and reflecting on the learning
* 3.1.3 Use writing and speaking skills to communicate new understandings effectively
* 3.1.4 Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess

***ACRL***:

* 4.1 The information literate student applies new and prior information to the planning and creation of a particular product or performance
* 4.2 The information literate student revises the development process for the product or performance
* 4.3 The information literate student communicates the product or performance effectively to others
* 5.3 The information literate student acknowledges the use of information sources in communicating the product or performance

***Bloom’s Taxonomy***: Creating, Evaluating

**Appendix B: Additional Resources**

GALILEO Presentations and Materials

http://help.galileo.usg.edu/librarians/documents/

GALILEO Resources for Educators

<http://help.galileo.usg.edu/educators/>

GALILEO Lesson Plan: Where I’m From in GALILEO

<http://help.galileo.usg.edu/educators/where_im_from_in_galileo/>

GALILEO Activity: Create Your Own Story

<http://help.galileo.usg.edu/educators/create_your_own_story_in_galileo/>

How GALILEO Supports the Common Core

http://about.galileo.usg.edu/docs/materials\_docs/CommonCoreGALILEOFeb2013.doc

NETS-S Performance Tasks

<https://www.georgiastandards.org/standards/Pages/NETS-S-Performance-Tasks.aspx>

Provides many project ideas for elementary and middle school students in language arts, math, science, and social studies

Grab GALILEO for Great Multimedia Projects

<http://about.galileo.usg.edu/docs/materials_docs/GrabGALILEONov2011.pptx>

Examples of NETS-S Performance Tasks with GALILEO resources to support them

How to Write a Research Paper (from Britannica)

<http://school.eb.com/resources/pdf/BSW_Research_Paper.pdf>

(Must be on site to access this)

AASL Learning Standards and Program Guidelines

http://www.ala.org/aasl/standards-guidelines

ACRL Standards Toolkit

http://www.ala.org/acrl/issues/infolit/standards/standardstoolkit