Essential Unit Guiding Question:

How and why do researchers evaluate search results?

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Advanced Lesson 2:

What are some strategies effective searchers use to find what they need?

LESSON OVERVIEW: In prior lessons, students have practiced paying attention to their search results page in a variety of ways, especially as the results suggest what tactical or strategic choices the searcher should make. In this lesson, students first read results to confirm if they asked the right questions, and then annotate a search results page to set up an array of tactical and strategic decisions. Then, students compile and share lists of strategies they may use while carrying out research. At the close of this exercise, they comment on a post by a research expert, sharing a strategy and search path they have successfully employed while carrying out research.

STANDARDS:

- *K-12 College and Career Readiness (CCR) Anchor Standards for **Writing 2**:* **Write informative/ explanatory texts** to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- *K-12 College and Career Readiness (CCR) Anchor Standards for **Writing 7**:* Conduct short as well as more sustained **research projects** based on focused questions, demonstrating understanding of the subject under investigation.
- *K-12 College and Career Readiness (CCR) Anchor Standards for **Writing 8**:* **Gather relevant information** from multiple print and **digital sources**, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

RESOURCES/MATERIALS

- Advanced 'Understanding search results' presentation (individual slides linked to proper locations below)
- Internet access (required)
- "Search Strategies" (provided)

ESTIMATED TIMING

- Approximately one 50-minute lesson

NOTE TO TEACHER: Throughout this lesson, there are opportunities to click links for search results if you have live Internet access. These links are expressed within most query brackets (e.g., [constitiution]). If you do not have Internet access in your classroom, click the links for slides (e.g., Slide 7) prior to class and print out screen shots to show on a document camera to your students, on an overhead, or through hard copies. In some lesson points, there are slides only as an instructional tool. Also please note that the actual square brackets around each query should not be typed into Google. They represent what words and phrases should be actually typed into the search box.

LESSON DETAILS:

1. **Set the stage.**

- Tell students that today the class will explore a few ***strategies*** for tackling search problems. A strategy is a plan to achieve an overall aim. Students can think of it as the path they chose to follow when doing research. ***Tactics*** are the individual tools searchers use or choices searchers make when carrying out a strategy. That is to say, if the strategy is the research path, the tactics are the individual steps that move a researcher along.

- Remind students that in the Beginner and Intermediate lessons they already encountered several research strategies. Today they will learn a few more. These are not all the possible strategies, but provide a good grounding in many of the major ones students will apply regularly.

Lesson:	Strategy:	What you do:
Beginner 1: Search terms	Alternative phrasing	Explore related terms or synonyms to describe an idea.
Beginner 3: Evidence	Plan-to-learn	Search to gain background knowledge and clarify search terms using such tactics as reading search results for new search terms, and using stepping stone resources to get background knowledge and inspire inquiry.
Beginner 5: Credibility	Comparing multiple sources	Use tactics including looking at changes in tone among different sources, contrasting "facts" to assess accuracy, and considering purpose and audience of different sources.
Intermediate 1: Search Terms	Chaining	Determine that a question can only be answered by gaining different pieces of information through a multi-step process, and planning the order in which to carry out each step to arrive at a successful outcome.
Advanced 2: Results & Strategy	Specialization	Use a small piece of knowledge—only part of the whole—to discover the whole.
Advanced 2: Results & Strategy	Generalization	Employ a broad topic when a specific topic is not findable. Then apply the broad source to solve the specific problem.
Beginner 3: Evidence	Scoping	Recognize what kind of source will answer a question, and searching specifically within that category of source.
Advanced 5: Credibility	Validate assumptions	Check that something you believe is actually true by researching it.

- In the following lesson points, you will teach two new strategies to students: ***Generalization*** and ***Specialization***.

2. <u>Triggering a generalization</u>.

- **Optional warm-up:** If you think it would benefit your students, start with an introduction to generalization. Set up this scenario: *"Say that you are doing research on the Statue of Liberty. Which of the following titles of books or websites would be promising places to look for information for that project?"* Request that students close their eyes. Explain that you will say titles of books or web pages. If a title sounds like it would offer useful information for a project on the Statue of Liberty give a thumbs up, but give a thumbs down if the title does not sound useful. Use a fist to show they are not sure. Titles which might have good information for the project are in bold.

    - *Colonial Life in the United States*
    - ***National Symbols***
    - ***Famous Landmarks in New York***
    - *Abstract Art in the 20th Century*
    - ***Engineering Feats***
    - *Mathematics the Easy Way*

- Explain that ***generalization*** is a strategy in which a searcher has a very specific information need, but uses a search for more general information to meet that need. Sometimes this is necessary if there does not seem to be information available, or at least findable, on the specific topic.

- Now, say: *"A student is thinking about math, and is trying to figure out how to [simplify 23/44+22/23+25/26]."* Invite students to figure out what they would search. Give them a few minutes to try it if the class has Internet access, otherwise, talk through it together. (Answer on Slides 2-3.)

3. Using specialization.

- Introduce the students to a challenge: *"Your family is going on a road trip and will be passing through Texas. Your mom asks you if there is any particular route you want to take, anywhere you really want to visit. You remember a friend telling you about a trip to some city with the highest roller coaster loop in the world and doing all this other fun stuff. You don't remember which friend. You don't remember which city. How would you figure out which city it was? Which city was it?"*

- If students have access to computers, give them a moment to try out the problem. Otherwise, brainstorm aloud about how to solve it. Students might note: *"Identifying [roller coaster tallest loop] should let you figure out the name of the roller coaster and amusement park, which should lead you to the city."* Answer on Slides 4-5.

- As the opposite of generalization, specialization is a strategy to undertake when a student cannot remember, or does not know, the term for a whole, larger concept—or simply cannot find information on the whole thing. Instead, the searcher knows one component of the desired whole, and leverages that knowledge to find the information needed.

- **Optional academic example:** Ask students to: *"Imagine a student who has been assigned to write about how beliefs were made visible through art in Cordoba, Spain, in the 10th Century. If the student begins with a search like [art Cordoba 10th Century], what problems might arise?"* Do not show them the search until after a brief discussion. Acknowledge and respond to suggestions, and then share the results for [art Cordoba 10th Century] (Slide 6). Ask students if the search went well. They might observe that *there*

are pages that are all about Cordoba, but nothing really seems to be about art. They may also observe, however, that *there are several mentions of categories of art that seem to be related to Cordoba and the 10th century: calligraphy, architecture, and Islamic art.* Discuss the fact that *art* is a very broad idea, and is unlikely to appear usefully when searched for with both a specific city and a specific century. Any two of the pieces of that query might work well together ([Cordoba art] or [10th century art], for example), but the three together do not work.

- If students have not yet noticed that there are specific mentions of calligraphy, architecture, and Islamic art showing up in the results snippets, guide them to notice them there. In either case, point out that during real research, students need to click through to any results they are using to see the information in context. This is particularly important when ellipses (three dots) appear in a snippet:

- Three dots in quote included in academic writing means that information has been left out, but the meaning of the quote remains essentially the same, even without it. In a Google search result, however, the three dots also mean that some words have been left out, but that is simply because Google is showing you where your different search terms appear on the page. They may not be anywhere near each other. In fact, very important information could have been left out. It is entirely possible (though not, in this case, true) that the page represented here says something like: *"Cordoba in the 10th century was a magnet for people who hated art. All kinds of art were banned. It was not until the 13th century that attitudes were reversed. Calligraphy was a highly valued art…."*

- If you have Internet access, look at this page with your students. As it happens, reading this page bears out the impression that calligraphy was an important art form in 10th Century Cordoba.

- Ask the students to suggest the next few steps they would take. Should the class choose to search for [calligraphy Cordoba 10th Century] (Slide 7), they may notice that *calligraphy was an important part of Islamic art in 10th Century Cordoba: the architecture of mosques.* A bit of poking around shows that all those aspects of art come together, with a solid list of search terms and a nice, sophisticated topic that represents—but does not include—the word *art*.

4. **Blog about it.**

- Introduce students to Dan Russell's *SearchResearch* blog. Point them to the post from January 3, 2012, entitled "Search strategies—What are they?"' In that post, Dan asks readers to share their favorite strategies. Some possible strategies are listed above. Dan's readers mention others in the comments. Ask your students to compose and submit their own comment on the post, sharing a strategy that they find helpful when doing research for school or daily life. Students should:

    - Select an appropriate example of a time they employed a search strategy to solve a problem.
    - In a paragraph or so, explain the problem and the strategy the student employed to solve the problem.
    - First create a copy of the comment to turn in for assessment purposes, then submit a copy of the

comment to the blog for Dan to consider posting with the other reader comments.

- In the next lesson, students will engage with a larger range of operators for narrowing their results.

ASSESSMENTS:

- Participation in discussion
- Comment on Dan Russell's *SearchResearch* post about search strategies

SEARCH STRATEGIES

Strategy:	What you do:
Alternative phrasing	Explore related terms or synonyms to describe an idea.
Plan-to-learn	Search to gain background knowledge and clarify search terms using such tactics as reading search results for new search terms, and using stepping stone resources to get background knowledge and inspire inquiry.
Comparing multiple sources	Use tactics including looking at changes in tone among different sources, contrasting “facts” to assess accuracy, and considering purpose and audience of different sources.
Chaining	Determine that a question can only be answered by gaining different pieces of information through a multi-step process, and planning the order in which to carry out each step to arrive at a successful outcome.
Specialization	Use a small piece of knowledge—only part of the whole—to discover the whole.
Generation	Employ a broad topic when a specific topic is not findable. Then apply the broad source to solve the specific problem.
Scoping	Recognize what kind of source will answer a question, and searching specifically within that category of source.
Validate assumptions	Check that something you believe is actually true by researching it.