Essential Unit Guiding Question:
How can appropriate search terms and queries guide targeted searches?

Beginner Lesson 1:
How can I figure out the right search terms to develop a query?
How are my search terms interpreted to gather information for me?

LESSON OVERVIEW: In this lesson, the ultimate goal is for students to understand that the words they choose to type into a search tool, such as Google, have a direct connection to the sources that are suggested by their results. Within this exercise, students practice taking real-world questions and topics and converting them into a set of search terms to use for developing queries. It culminates with students identifying search terms and creating queries for their own research projects.

STANDARDS:
- **Grade Specific Content Standards:** RI.5.3 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
- **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.
- **K-12 College and Career Readiness (CCR) Anchor Standards for Language 6:** Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

RESOURCES/MATERIALS:
- Beginner “Picking the right search terms” Lesson Presentation (individual slides linked to proper locations within this lesson)
- Internet access (optional, but recommended)
- Video: “How Search Works” (in presentation, Slide 4)

ESTIMATED TIMING:
- approximately two 50-minute lessons

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., [constitution]). 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
LESSON DETAILS:

1. **Set the stage.** In this lesson, students will focus on formulating search terms to find information. Tell them they will specifically address the guiding questions: *How can appropriate search terms guide targeted searches? How are my search terms interpreted to gather information for me?* In doing so, introduce three different ways for identifying the right terms which will lead to better results. Explain that **search terms** are the individual words or sets of words you type into a search engine, such as [evaporation], [polar bear], or [fraction]. Students will choose the way that best fits with their learning style to develop key search terms – and ultimately **queries** (the full set of words typed into Google for a search) from these key terms – for their research task.

2. **Illustrate results of using ineffective search terms and why this happens.**
   - Before demonstrating ways to write effective key search terms and queries, demonstrate how and why poorly chosen ones can be a waste of time. You can use this script for a demonstration:
     - Tell this story: “Imagine that you are making a fan quiz about the Percy Jackson books. You list a whole bunch of questions and then go back and research them one by one.”
     - Let’s say you want to know: “What food does Tyson like best?” (Slide 2) Would these questions be good to type into Google for a search request? Let’s try it. Slide 3.
   - Go to Google.com. Copy and paste the question from the bullet above into Google and see what happens. If you do not have live Internet access, use Slide 3 from the presentation. Have your students observe the results and discuss what they see. They may make observations such as: “The words are not staying together,” or “Google does not know who you are asking about,” or “Lots of the little words are showing up, but I don’t see the important ones.”
   - Show the three-minute video entitled “How Search Works” (Slide 4 in the presentation, if you want to show it on a white background) to creatively and visually illustrate how Google uses the search terms to find information and order results. Before showing it, pose the guiding question: “How are search terms interpreted to gather information for me?”
   - Ask students to revisit the questions and results used to search for the information about Tyson. Ask them what might have gone wrong. Students might observe: “Our question had a lot of general words,” or “Our question had unnecessary words.”
   - Tell students that this situation means you need to search for the words on the page you want to find, rather than the words that popped into your mind. You might say, “You have to search with a query that matches the words in your answer, rather than in your question. Consider what the source of the author might have said and what words he or she is likely to use to describe what you need.”
   - Now that they are more aware of how searches work, ask: “What other terms would have been more helpful in conducting this search?” Tell them you will demonstrate in different ways how to create key search terms for a research task and use them to develop a query. They will choose which one best suits their style to develop search terms and queries for their own research tasks.

3. **Parsing a question.**

   **Parse a question to arrive at a query (group practice).**
   - Consider referring to the video, saying: “When search expert Matt Cutts was looking for how fast a cheetah can run, did he type in: ‘How fast can a cheetah run?’” When students note that he did not,
that he searched *[cheetah running speed]*, note that effective searchers do not type full questions into search tools.

- Explain to students that this is the first of three possible ways to show how to take a question or research need and transform it into effective search terms. Write the questions on a whiteboard or SMART Board for the question about Tyson: **What food does Tyson like best?** Mark up the questions using the following steps. Below is an explanation of each step to share with students as it relates to the original questions.
  - Circle **key words**
  - Underline “maybe” words, offer synonyms or replacement terms
  - Add missing words
  - Ignore unnecessary words

**Explanation:**

*Keywords.* A **key word** is a word that is essential to communicating your need. You will circle the key words to use as search terms. You may want to use different color pens for each step, as well. Ask students to help you identify the key words. Key words are often common or proper nouns, but they can also be other words, too. **Slide 6.**

**What food** does **Tyson** like best?

“**Maybe**” words. Next, explain that there may be words that you don’t know if you need or not. There might be different ways of expressing the same idea. Or, there might be ideas that you need to convey, but the words of the question don’t seem like the way someone might state the question in writing. You are going to underline those words, and write in a new word, if needed. This is a strategy called **alternative phrasing.** For example, you might say, “I try to imagine in my head what a newspaper article talking about this story might say—how the sentence I want to find might be worded.” You might prompt: “Is ‘like best’ the most common and straightforward way we have to express the idea of a person’s special preference? Or do we have another word for it?” **Slide 7.**

**What food** does **Tyson** like best?  

**favorite**

**Missing words.** Ask students if there is any information missing. Remind them that the question came up in the context of writing a quiz on the Percy Jackson books so not every term that Google needs to identify sources on the proper topic is expressed in the question. Ask students to suggest information that is missing: **Slide 8.**
Unnecessary words. You can ask students to help you select words to cross out. You might say, “If I want to remind myself not to include small words or words that I am less sure will appear in my search results, I can cross those out to be extra-clear.” Slide 9.

Draw on what is left to create a query to type into the search bar. Queries are expressed inside brackets to set them apart from regular text. For this exercise, the eventual query would be [tyson favorite food percy jackson]. Slide 10. Instruct students not to type the brackets in the search bar; just type the query. The same way students use quotation marks to show that someone is speaking, or a period to note the end of a sentence, Google uses brackets to show what words get typed in as a query. Note that all words in a query can be expressed in lowercase letters, as Google does not distinguish case.

Once your class has built a query, try it out in Google, or use the query suggested in the bullet above. Look at your results and see if you can find the answer you need, or determine if you need to revise your query a bit more. You might say to students: “Searching is a process, and sometimes it might take a few tries to discover the right query. That is not a problem. Just practice looking at your results and asking yourself, ‘What happened?’”

Practice how to parse a question to arrive at a query (student).

Divide students into small groups and give each group a question to change into a query. Print the question on a large piece of chart or butcher paper in large font; give each group a set of colored pens. You can create your own questions, but here are some suggestions you might use:
- My three-year-old cow has blisters on its tongue. What’s wrong with it?
- Can I make a living tossing pizza for money?
- I heard there is an abandoned city in the San Francisco Bay. What is it called?

Reconvene as a whole class and invite each group to share its query. Discuss options as a class. When groups have finished, ask the class to arrive at a general rule that describes what they learned with this exercise. They might come up with something like: “Keep it simple. Describe what you want in as few terms as possible.” Explain that when they begin planning for their research, they can first brainstorm questions and use these questions to develop key terms for crafting a query. Next they will learn another method and will ultimately choose which one best helps them in collecting information.
These are suggested ways you might parse and create queries from the practice questions (Slides 11, 12, 13):

4. **Build webs or lists.**

*Use a web to arrive at a query (teacher-led).*

- In this method, students use a web (or list) as an instrument to develop key search terms to use for their queries. For students who are having trouble thinking of keywords around a topic, this graphic organizer might be a great way to help them identify what they already know and make that terminology available for searching. For students who do not take to webs, a list is a good alternative. Keyword webs/lists are not intended to reflect the organization of any future project work. Rather, they
are intended to articulate existing knowledge and will reflect additional information as students develop more knowledge and discover new search terms during the research process.

- As a class, work together to create a keyword web on a topic that is generally of interest, such as a sport, your school or state, or a subject you are currently studying in class. For example, *community helpers* is a difficult concept to search, since the sources holding the information students really need are likely to refer to one kind of worker or another, not to the overarching concept of *community helpers*. The search [community helpers] primarily retrieves teaching materials on the subject (Slide 14).

- After you finish a draft of the web, do the following:
  - Consider alternative phrasing, add synonyms for any word entries.
  - Check the synonyms and ask students to identify formal and informal pairings.

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**Practice how to use a web to arrive at a query (student).**

- Ask students: “What do you think would happen if we entered all of the words in the search bar from your web at once?” Students might note that you would be unlikely to find any useful pages if you demand too much. Review what you learned in the last lesson as you parsed the questions to find key search terms.

- Using the tools from the parsing exercise, instruct students to work in pairs or trios to arrive at a query based on the class web. Ask volunteers to share and arrive at a few queries that would be appropriate to use for a search. If you have Internet access, try two or three of the queries and compare search results.
  - **Extension:** Have class work in small groups to create their own web for another topic to develop search terms and possible queries. Allow several/all groups to share with the class to provide another example other than the class-generated web.

- **Differentiation:** Invite more experienced searchers to create a web for query that combines several concepts, such as inventions from Italy during the Renaissance. Provide additional support to those...
students who need adult assistance in creating their queries.

5. **Draw on prior knowledge to build a query.**
   - Explain that there is another method researchers might use to develop queries. This method simply draws on prior exposure to material to predict good keywords.
   - Remind the class of a piece of reading they have done recently. If the whole class read the same text, you can do this activity together; otherwise, the class can work in groups based on their **differentiated** reading assignment. Ask students to think back on what they read individually or in groups or text that you read as a whole class. Pose the question: “If you were going to make a vocabulary list of important words from the reading, what would they be?” You might ask students to list the five most important nouns in the piece, for example. Remind students to keep in mind that earlier in the lesson you discussed the idea of searching for the words that are in your ideal answer, rather than in your question. Together on the whiteboard, or individually or in small group on paper, record the list.
   - Ask students to look at the class list or individual/small group lists and respond to this prompt: “If you needed to search for more information, what query would you create from this word list?” Invite students to share and discuss their queries.
   - Emphasize that expert searchers strive to draw upon prior experiences, such as materials they have read or heard before, to pick successful search terms. Assure students that a later lesson will cover methods searchers use to discover formal terms.
     - **Differentiation.** Group students based on the on the reading material that they use as the basis for creating their queries.

6. **Provide additional tips for developing queries.**
   - Before providing additional tips, you might suggest to students this simple rule in searching: **Identify unique words; do not have too many words; use mostly nouns.** When keeping this rule in mind, tell students that if they can draw a picture of the words in their queries, including verbs and adjectives, they are probably on the right track. In fact, as an optional exercise have students draw their queries to see if it helps them to find the right terms to use.
   - **Tip #1:** Feature “What Matters in a Query?” (Slide 15) from the presentation, a figure that outlines common elements that do, or do not, affect your search. **Option:** Try out the suggested searches with your students featured in this handout if you have Internet access, or make use of the **screen shots in the presentation.**
   - **Tip #2:** Tell students that one way expert searchers choose search terms is by imagining in their mind’s eye the source they expect to find and figuring out how to look for it. This may help them realize that they want a video instead of text, or it may help them determine how formal or informal their search terms need to be. See this example:
     - What is that little indentation in your skin above your lip called? Search and try to find out.  
     - If you want to know what the dip over your upper lip and below your nose is called, you might imagine that there will be question and answer sites where people ask: “What is that thing above my lip called?” and realize that the query [thing above lip] (Slide 25) may be a very effective search.
   - On the other hand, if you want to know what kind of medical problems can occur for that indentation, you can imagine that the source explaining it will refer to it by its formal name, philtrum, and might contain a sentence that begins: “If a patient is diagnosed with a ___ philtrum...” Emphasize to students that the query can be written formally such as [diagnosis philtrum] (Slide 26), or it might be a more informal query such as [problem with thing above lip] (Slide 27). Discuss that the way a query is written will dictate the kinds of results, so students
should be mindful of the formality of their language.

7. **Create queries from key search terms.** Have students use one of the three methods introduced in this lesson to arrive at key search terms and then queries for their research task. Have them submit their queries along with the work showing how they used one of these methods to assist them in developing queries: (1) parsing, (2) web, and (3) word list based on prior experience. Students will read the results of these queries in the following Foundational Lesson #2 to choose what sources they want to examine.

**ASSESSMENTS:**
- Participation in discussion
- Parsing, web, or word list
- Queries
- Results of search
## What Matters in a Query?

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| **1** | Every word matters.  
*Try searching for* [who], [the who], and [a who]* |
| **2** | Order matters.  
*Try searching for* [blue sky] and [sky blue]* |
| **3** | Capitalization does not matter.  
*Try searching for* [barack obama] and [Barack Obama]* |
| **4** | Punctuation does not matter.  
*Try searching for* [red, delicious% apple&] and [red delicious apple]* |
| ***** | There are some exceptions!  
*$ C#  C++  Google+  but not ¶ £ € © ® + § % () or @*  
*Can you think of any?* |