

9.3.2

Lesson 3

Introduction

In this lesson, students continue to refine their inquiry questions as they begin to frame their research by planning for independent searches. Students learn how to select inquiry questions, plan search locations, and use key words and phrases to conduct effective and efficient research. Additionally, students learn how to begin formally assessing sources by analyzing a source's relevance to the inquiry question and its credibility.

Students begin the lesson by engaging in a research project check-in where they overview their **Student Research Plan** and informally journal about their research progress and next steps. The teacher models how to plan effective searches by selecting inquiry questions, planning where to look for sources, and choosing key words or phrases that target an effective and efficient search. Additionally, students discuss how these steps can contribute to finding credible and relevant sources. Students then transition into searching for relevant and credible sources using key words or phrases from their selected inquiry question and recording notes on a **Potential Sources Tool**. The learning in this lesson is assessed with a Quick Write in which students analyze three sources for relevance and credibility, explaining how they found the sources as well. For homework, students continue to conduct preliminary searches for one inquiry question, using the **Potential Sources Tool** to find three more potential sources. Students will prepare to discuss the preliminary search results in the following lesson.

Standards

Assessed Standard(s)	
W.9-10.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
Addressed Standard(s)	
W.9-10.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Assessment

Assessment(s)

The learning in this lesson is captured through a Quick Write at the end of the lesson. Students answer the following prompt based on their preliminary search for relevant and credible sources:

- Choose three sources from today's work and discuss how they meet the criteria of being credible and relevant sources. Additionally, discuss the inquiry questions, locations, and key words or phrases that led you to the discovery of the three credible and relevant sources.

 The assessment is evaluated using the following criteria:

- Uses inquiry questions to drive research and identify sources.
- Assesses sources for credibility; identifies the usefulness of a particular source and explains why a particular source does or does not help respond to an inquiry question.

High Performance Response(s)

A High Performance Response may include the following:

- The search words I used were taken from my selected inquiry question: What does animal intelligence tell us about human intelligence? I typed the phrase "human and animal intelligence" into a search engine. I realized this phrase was too broad so I tried the phrase "comparing human and animal intelligence." There were many credible and relevant sources to choose after typing in this phrase.

I started with an NBC essay, "The 10 Smartest Animals: How do humans compare to other intelligent creatures?" This essay is about smart animals and comparisons to human intelligence, so it is relevant to my search. NBC seems to be a credible source since it is an important TV network.

The second source is a science magazine, *Scientific American*. I selected it because it states the opposite point of view of the NBC essay: "Subtle refinements in brain architecture, rather than large-scale alterations, make us smarter than other animals." I want to find more than one perspective regarding my research question/problem, so this essay is important.

I then tried a different phrase. I asked, "Are animals smart?" The results were mostly new. In *National Geographic*, a credible source, I found a relevant article: "Animals Minds: Minds of Their Own," by Virginia Morell. Both *Scientific American* and *National Geographic* are reputable sources because their writing uses credible research to support their articles, and our media specialist told the class about these two sources when we conducted pre-searches in Unit 1.

Vocabulary

Vocabulary to provide directly (will not include extended instruction)

- authoritative (adj.) – substantiated or supported by documentary evidence and accepted by most authorities in a field
- plagiarism (n.) – act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author
- credible (adj.) – worthy of belief or confidence; trustworthy

Vocabulary to teach (may include direct word work and/or questions)

- None.*

*Students will encounter domain-specific vocabulary related to their individual research question/problem by reading, annotating, and recording notes on various sources. Students will track some of this vocabulary in their Vocabulary Journal when conducting independent searches during class and for homework.

Lesson Agenda/Overview

Student-Facing Agenda	% of Lesson
Standards & Text: <ul style="list-style-type: none"> • Standards: W.9-10.8, W.9-10.7 • Text: “Animal Minds: Minds of Their Own,” by Virginia Morell 	
Learning Sequence: <ol style="list-style-type: none"> 1. Introduction of Lesson Agenda 2. Homework Accountability and Research Process Check-In 3. Planning for Searches 4. Conducting Research 5. Quick Write 6. Closing 	<ol style="list-style-type: none"> 1. 10% 2. 15% 3. 30% 4. 30% 5. 10% 6. 5%

Materials

- Student copies of the **9.3 Common Core Learning Standards Tool** (refer to 9.3.1, Lesson 1)
- **Research Portfolio** (students have this)
- At least two blank copies of the **Potential Sources Tool** for each student (refer to 9.3.1 Lesson 8)
- Computers with Internet connection (one for each student)
- Smart Board/Document Camera (optional)

Learning Sequence

How to Use the Learning Sequence	
Symbol	Type of Text & Interpretation of the Symbol
10%	Percentage indicates the percentage of lesson time each activity should take.
no symbol	Plain text indicates teacher action.
	Bold text indicates questions for the teacher to ask students.
	<i>Italicized text indicates a vocabulary word.</i>
►	Indicates student action(s).
💬	Indicates possible student response(s) to teacher questions.
❗	Indicates instructional notes for the teacher.

Activity 1: Introduction of Lesson Agenda

10%

Begin by reviewing the agenda and the assessed standard for this lesson: W.9-10.8. Explain that students begin with a research project check-in during which they overview their Student Research Plan and informally journal about their research progress and next steps. The teacher then models how to plan for effective searches by selecting inquiry questions, planning where to look for sources, and choosing key words or phrases that target an effective and efficient search. Students discuss how these steps can contribute to finding credible and relevant sources. Students then search for relevant and credible sources using key words or phrases from their selected inquiry question and recording notes on a Potential Sources Tool.

- Students look at the agenda.

Explain that students will be assessed on a new standard: W.9-10.8. Ask students to read standard W.9-10.8 individually and assess their familiarity with and mastery of the standard on the 9.3 Common Core Learning Standards Tool. Ask students to write down what they think are the large ideas in the standard and discuss in pairs.

- Students write down their ideas about standard W.9.10.8 and discuss it in pairs.

Lead a discussion about the standard's large ideas. Ask students to consider in their responses how the standard relates to their current research work.

- 💬 Student responses should include the following:
 - We are starting our own research and this standard is about gathering information from sources to conduct the research.
 - *Authoritative* must mean (because of the noun *authority*) that the information is from a credible or academic source. The research has to come from a location that has authority regarding the topic.

- We need to assess every source to see if it corresponds to our research question/problem. The source needs to be relevant by answering an aspect of the research question/problem or the research question/problem itself.
- And it is important not to cheat or plagiarize (say that an idea is ours when it is not).

If necessary, define the words *authoritative* (“substantiated or supported by documentary evidence and accepted by most authorities in a field”) and *plagiarism* (“an act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author”).

① In the next unit, Unit 3, students will learn more about the importance of and how to avoid plagiarism when they write (citation).

Explain to students that the standard W.9-10.8 works together with W.9-10.7 to guide the type of research students will conduct in this unit.

- ▶ Students listen.

① Standard W.9-10.7 was introduced in Lesson 1.

Activity 2: Homework Accountability and Research Process Check-In

15%

Instruct students to take out their Lesson 2 homework. Direct students to form pairs and discuss how they refined their five specific inquiry questions using the Specific Inquiry Questions Checklist.

- 💬 Responses will vary, but will include information like the following: The small group brainstorm from Lesson 2 began with more simple questions that were not specific enough but they gave me a general idea of where my questions could go. I then added to the questions brainstormed to give them more specificity and to ensure they required multiple answers and relevance to my inquiry question/problem. For example, I started out with questions like: Can animals make decisions? I realized that this question needed more specificity and required a yes/no answer. So I changed the question to give it more of a focus and to ensure that the answer would require multiple answers as discussed on the Specific Inquiry Questions Checklist

Ask student pairs the following question:

What role do questions play in the research process?

- 💬 Student responses may include the following:
 - Questions play an important role in research by showing you the different aspects of the research question/problem.

- They allow you to think about the variety of ways in which you can approach your question/problem.

Instruct students to take out the Student Research Plan in the front of the Research Portfolio. Remind students that they received the Student Research Plan in the previous lesson. Explain that the purpose of the plan is to help students track their research progress by informally assessing completed research activities and planning next steps in a research journal. Remind students that the research process is iterative and cyclical, as the Research Plan suggests; there are specific steps that are not “completed” after one time. Journaling about the research process will help students track where they are in this iterative process.

- ▶ Students listen.

Instruct students to focus on Part 1 of the Student Research Plan and write a few sentences about their research progress and next steps based on the process outcomes described in Part 1.

- 💬 Responses will vary, but will include information like the following: I was able to narrow down the many topics surfaced in Grandin’s text to a few areas of investigation that I thought were worth exploring. But I quickly realized with my pre-searches that researching areas like the history of autistic savants was not going to prove interesting and did not lend itself to many inquiry questions. Instead, I chose animal intelligence compared to human intelligence because it is going to provide many paths to explore as revealed in my variety of specific inquiry questions that I was able to develop in Lesson 2.

- ① Consider having students write in a notebook or on a separate sheet of paper for the research journal. Students can file the research journal in the Research Portfolio, along with the Vocabulary Journal.
- ① While students are writing, consider distributing the previous lesson’s assessment with feedback so students can use this information for the reflection journal. Then students can file the assessment in their Research Portfolios for later use.
- ① The purpose of the research journal is to keep students accountable to the research process; fidelity to the process is vital if students are to conduct effective and efficient research. Providing students with an opportunity to reflect on the research process will help them build a foundation for inquiry that will take place in subsequent modules.

Instruct students to file the Student Research Plan in the front of their Research Portfolio and to organize the previous lesson’s homework and assessment in Section 1.

Activity 3: Planning for Searches

30%

Explain to students that they are ready to plan for effective searches to conduct formal research now that they have established a research question/problem and crafted specific inquiry questions.

Inform students that when planning for effective inquiry-based research, there are several steps to follow:

- Select an inquiry question to focus on
- Determine where to look for sources
- Choose key words or phrases to begin the search

Remind students that in the pre-search activities they identified a variety of sources. In today's class they are going to be looking for *credible* and *relevant* sources for their specific research question/problem, using the steps for planning effective and efficient research mentioned above.

Define the word *credible* ("worthy of belief or confidence; trustworthy"). Explain to students that credible sources are sources that have proven their worth through peer review and extensive research on a topic. Credible sources have employed the same inquiry methods of research that the students are currently conducting.

- ▶ Students listen.

① Consider reminding students that they learned the word *relevance* in 9.3.1 Lesson 9.

Ask students the following questions:

What are some of the sources you identified in your pre-search?

💬 Student responses may include the following:

- articles
- interviews
- speeches
- videos
- charts
- blogs

Did some sources seem more credible than others? How did you decide which were more credible than others?

💬 Student responses may include the following:

- If I find material about autism in a medical journal, it is probably credible because medical researchers have to conduct extensive research to be published in a medical journal.

- A government study about meat and antibiotics in cattle is probably credible because the government has performed lengthy research or experiments on the topic.
- If I am looking for studies where numbers are important (for example, how many cows die in the chutes), if an article does not provide data, it might not be as credible as an article that provides actual research data.

① Advise students to ask the teacher, librarian, or media specialist if they are not certain about the credibility of a source.

Explain to students that the planning they do today for effective and efficient searches will guide them to sources that are more credible and relevant. The Potential Sources Tool will then help students to further assess sources for credibility and relevance.

► Students listen.

① Consider informing students that today's lesson is an introduction to assessing sources and the following lesson will go more in-depth on this skill.

Share with students that effective and efficient searches begin with a focus. The type of research they are conducting in this unit is inquiry-based, so the specific inquiry questions students develop for the overarching research question/problem will guide the research focus.

Explain to students that the first step in planning for an effective and efficient search is to select an inquiry question to focus the research.

Explain to students a few guidelines for selecting inquiry questions to focus research:

- Move from general inquiry questions to specific.
- Move from questions that are easily answered to more complex questions with more interesting answers.
- Remember that the questions are always evolving and you can move from one question to another if the research takes you there.

► Students listen.

Model for students how to select inquiry questions by displaying the following three model questions (from the previous lesson) for students to see:

- How do researchers measure animal intelligence?
- What characteristics do the animal and human brain share?
- What animals have “genius-like” qualities and how do we know?

Explain to students that the question “What characteristics do the animal and human brain share?” is the best question to focus the research because it is specific enough to generate concrete answers, but general enough to generate rich information. The first question may be too large and complex, while the third question’s focus exclusively on “genius” seems too specific as a starting point.

- ▶ Students examine the three model questions and follow along with the modeling.

Explain that the second step in planning a good search is to determine the best sources for finding the information about the inquiry question. Give students the following questions to help them select and locate the right sources:

- What is the area of my search and where could I find credible sources? If I am looking at autism, then the field is developmental disorders. I will search in either that section of the library or an online source or website that specializes in developmental disorders.
- What type of information am I looking for and what type of sources should I be looking for? If I am looking at the rise or decline in autistic populations, I will need numbers, so I am looking for reports. If I am looking at the significance of an historical event, I will need to look at magazines or books that specialize in that time period.

Remind students that the location of the source is important in guiding students to credible and relevant sources.

Display the model inquiry question discussed previously: What characteristics do the animal and human brain share?

- ▶ Students examine the model inquiry question.

Ask students the following questions:

Under which topics does my search fall, and where might I find credible information for this search?

- ☞ Students responses may include:
 - biology
 - science
 - intelligence
 - medicine
- ☞ Credible information might be found on specialized websites and in specific sections of the library associated with medicine and biology.

What type of information am I looking for, and what sort of sources should I be looking for?

- ☞ Students responses may include the following:

- I am looking for facts on comparing human and animal brains, so I might look for journals and magazines that focus on neuroscience or biological psychology.
 - I am also looking for how the animal and human brain are alike so there might be credible experiments and reports that have conducted this type of research.
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Explain the third step in planning a good search: selecting the best key words and phrases for the online search. Demonstrate an online search with key words and phrases using this model question: How do researchers measure animal intelligence? Conduct two searches as described below, and display the online search for all students to see. Instruct students to take brief notes on the results.

- Enter the search phrase: current research on animal intelligence
- Examine results of the search.
- Change the search phrase: How do researchers measure animal intelligence?
- Examine results of the search.
 - ▶ Students listen and take notes.

① Consider using a smart board or document camera to display the search results.

Instruct students to form pairs to discuss the differences they see between the two searches and results.

① Alternate between the two searches, giving students an opportunity to compare results. Provide students with time to take brief notes.

What differences did you notice between the results of the two searches?

☛ Student responses may include:

- In the first search there are different types of sources: a magazine, *Scientific American*; an animal rights organization, PETA; and a TV station, NBC. These three seem like credible sources to read because they all have authority regarding the topic. *Scientific American* and PETA both focus on science research and animals respectively.
- In the second search, some of the results are different. The most interesting that could be a very good source and did not appear in the first search is the article from *National Geographic*.

Point to several other important results. At the top of the search page students see the phrase “Scholarly articles for assessing human intelligence.” Introduce the students to Google Scholar. Explain to them that it will help direct their search towards credible sources.

- ▶ Students examine the search results.

Go back to the original search page and point to the .edu sources. Inform students that .edu usually means that this is a university site and therefore is often a credible source because university professors conduct extensive research before publishing documents.

Inform students that substituting a key word with a synonym (word that means the same) leads to more and sometimes different results. Remind them that they can also ask questions:

- Enter the search words: Are animals smart?
- Examine the results of the search.

What do you notice about the search results?

💬 Students responses may include:

- The search words seem similar but because you used the word *smart*, some of the results were different.
- This resulted in some credible sources including: *National Geographic* and PBS (Public Broadcasting Service).

Remind students that they can use the information they have on the original page to search the source directly rather than open the one link. For example:

- Search for Scientific American site.
- Enter search phrase: animal intelligence
- Search Result: The first of a two-part interview with anthropologist Carel Van Schaik about the role of culture in boosting intelligence in animals. (The interview is available both in audio and in print.)

Show another example:

- Search for the National Geographic site.
- Enter search phrase: animal intelligence
- Result, an article: “Animals Minds: Minds of Their Own,” by Virginia Morell.

Ask students:

What makes these sources both relevant and credible?

- 💬 Both sources seem credible because they have numerous essays and articles about nature and animals. They are relevant since both publications have information about animal intelligence.

Ask students to think of an example of a source that may make a source unreliable or not credible.

- 💬 Student responses may include the following:

- Teachers tell us not to use encyclopedia when we write papers. I think that this is because here we are not just looking for background but studies and research that other people do.
- Then there is Wikipedia. It is not always clear who writes the essays, so potentially they may not be credible.

Explain to students that they can find out how long these publications have existed. This fact usually points to credibility. Also, the author's profession is important: Is he/she a scientist or a professor in college? Has the author published a study in the field? The answers to these questions may identify a credible source or exclude one that is not credible.

- ▶ Students listen.

Activity 4: Conducting Research

30%

Explain that in this part of the lesson, students practice finding credible and relevant sources using key words/phrases from their research question/problem and specific inquiry questions. Distribute blank Potential Sources Tool to each student.

Model how to use the Potential Sources Tool by using the source from the previous activity. On the top left, number the source (begin with 1). Record basic information:

- Title: "Animal Minds: Minds of Their Own"
- Location: *National Geographic* online <http://ngm.nationalgeographic.com/2008/03/animal-minds/virginia-morell-text>
- Author: Virginia Morell
- Text Type: Article
- Publication Date: March 2008

① Consider displaying the Potential Sources Tool for students to see.

Read aloud the first two paragraphs of the article (from "In 1977 Irene Pepperberg, a recent graduate of Harvard University, did something very bold" to "that it is able to acquire information about the world and act on it").

- ▶ Students listen and follow along in their copy of the text.

Instruct students to turn their attention back to the Potential Sources Tool. In the second part of the Potential Sources Tool write the following comments for students to see:

The article is relevant because it is about researching animals' intelligence, which is my focus inquiry question. Also, it seems credible because at the beginning the writer cites a study conducted by a Harvard scientist, which shows the writer is looking at research to compose the article.

- ① A completed Model Potential Sources Tool is included at the end of the lesson; consider distributing to students for support.
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Instruct students to independently search for credible and relevant sources for one inquiry question by following the steps for planning a search:

- Select an inquiry question on which to focus.
 - Determine where to look for sources.
 - Choose key words or phrases to begin the search.
 - ▶ Students independently conduct searches for one of their inquiry questions.
- ① Consider placing students in small heterogeneous groups that will remain consistent throughout the module, or using the groups established during the previous lesson. Form groups ahead of time to maximize the range of different research topics and questions within each group. (For example, one group might consist of a student researching potential causes of autism, the impact of B.F. Skinner on modern psychology, factory farming/slaughterhouses and animal welfare, and the advantages of visual thinking.) The goal of these groups is to create small communities of inquiry/research teams that provide support and are accountable to each other. Students should know about their teammates' research question/problem. Students should share claims and evidence that arise from their individual inquiry and learn from each other's research processes, which they may use to potentially refine their own research questions/problem and inquiry questions.

Remind students to record basic information about the source in the Potential Sources Tool. They are not expected to read the text closely at this point. The purpose of this tool is to help students locate the source again later. Instruct students not to fill in the bottom part where they rank the source, since they will be assessing sources more formally in the following lesson.

- ▶ Students record basic search information on the Potential Sources Tools.
- ① Students need access to computers with Internet capacity for research purposes. Prepare for the lesson ahead of time by reserving space in classrooms with technology access for all students.
- ① Consider using the media center or library for this lesson so students have access to librarians or media center teachers.
- ① Circulate around the room to support students as they engage in this preliminary research process.

Activity 5: Quick Write

10%

Instruct students to respond briefly in writing to the following prompt:

Choose three sources from today’s work and discuss how they meet the criteria of being credible and relevant sources. Additionally, discuss the inquiry questions, locations, and key words or phrases that led you to the discovery of the three credible and relevant sources.

Remind students to use the Short Response Checklist and Rubric to guide their written responses.

① Display the prompt for students to see, or provide the prompt in hard copy.

- ▶ Students independently answer the prompt using the lesson’s Potential Sources Tools and the preliminary research conducted in the lesson.
- 🗨 See the High Performance Response at the beginning of this lesson.

Activity 6: Closing

5%

Display and distribute the homework assignment. Distribute additional Potential Sources Tools to each student. For homework, instruct students to continue to conduct preliminary searches for one inquiry question, using the Potential Sources Tool to find three more potential sources. Students will prepare to discuss the preliminary search results in the following lesson.

Homework

Continue to conduct preliminary searches for one inquiry question, using the Potential Sources Tool to find three more potential sources. Prepare to discuss the preliminary search results in the following lesson.