

9.3.2

Lesson 2

Introduction

In this lesson, students learn how to generate more specific inquiry questions to frame their research. Students were introduced to inquiry questions in Unit 1, but will learn how to craft specific inquiry questions for their formal research question/problem (area of investigation) developed in the previous lesson.

In the beginning of the lesson, students engage in a research process check-in during which they overview the **Student Research Plan**. The **Student Research Plan** serves as a guide to the research process and a place to reflect on next steps. Next, students review inquiry questions from Unit 1 and help generate inquiry questions for their peers' research question/problem. Individually, students then use a **Specific Inquiry Questions Checklist** to vet the inquiry questions brainstormed by their peers and finalize a list of at least five specific inquiry questions that will guide their research. For the lesson assessment students select and submit their two strongest questions. For homework, students continue to craft, vet, and refine five more specific inquiry questions for their research question/problem using the **Specific Inquiry Questions Checklist**.

Standards

Assessed Standard(s)	
RI.9-10.1.a	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. a. Develop factual, interpretive, and evaluative questions for further exploration of the topic(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.
Addressed Standard(s)	
SL.9-10.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 9–10 topics, texts, and issues</i> , building on others' ideas and expressing their own clearly and persuasively.

Assessment

Assessment(s)
<p>Students generate at least five specific inquiry questions that will guide their research. Students turn in two of these questions for assessment purposes.</p> <p>① This assessment is evaluated using the Specific Inquiry Questions Checklist.</p>
High Performance Response(s)
<p>A High Performance Response may include the following:</p> <ul style="list-style-type: none"> The inquiry questions developed depend on the students' specific research problem/question (area of investigation). Teachers can use the Inquiry Questions Checklist criteria to guide their assessment of the students' two specific inquiry questions. Examples of specific inquiry questions for the model research question/problem: "How does animal intelligence compare to human intelligence?" are the following: <ul style="list-style-type: none"> How do researchers measure animal intelligence? How can animal intelligence be used to benefit humans? What characteristics do the animal and human brain share? What kinds of complex decisions do animals make? What does animal intelligence look like and how is it different from human intelligence? What animals have "genius-like" qualities and how do we know?

Vocabulary

Vocabulary to provide directly (will not include extended instruction)
<ul style="list-style-type: none"> factual (adj.) – based on or restricted to facts interpretive (adj.) – serving to explain or provide the meaning of evaluative (adj.) – serving to determine the significance, worth, or quality of cyclical (adj.) – recurring or evolving in cycles
Vocabulary to teach (may include direct word work and/or questions)
<ul style="list-style-type: none"> 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: RI.9-10.1.a, W.9-10.7, SL.9-10.1 	
Learning Sequence: <ol style="list-style-type: none"> 1. Introduction of Lesson Agenda 2. Homework Accountability 3. Research Process Check-In 4. Inquiry Questions Review 5. Small Group Brainstorm 6. Vetting Specific Inquiry Questions 7. Finalizing Specific Inquiry Questions 8. Closing 	<ol style="list-style-type: none"> 1. 5% 2. 5% 3. 5% 4. 10% 5. 30% 6. 20% 7. 20% 8. 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)
- Student copies of the **Pre-Search Tool** (refer to 9.3.1 Lesson 8)
- Copies of the **Student Research Plan** for each student
- Copies of the **Specific Inquiry Questions Checklist** for each student

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

5%

Begin by reviewing the lesson agenda and assessed standards for this lesson: RI.9-10.1.a and W.9-10.7. Explain that in this lesson, students learn how to generate specific inquiry questions to frame their research. First, students engage in a research process check-in where they overview the Student Research Plan. Then, students work in small groups to help generate inquiry questions for their peers' research question/problem. Using an Inquiry Questions Checklist to vet the inquiry questions brainstormed, students finalize a list of at least five specific inquiry questions that will guide their research. Students turn in two of these specific inquiry questions for assessment purposes.

- ▶ Students look at the agenda.

① Students were introduced to W.9-10.7 in the previous lesson.

Explain that students will be assessed on a new standard: RI.9-10.1.a. Ask students to individually reread standard RI.9-10.1.a and assess their familiarity with and mastery of the standard on the 9.3 Common Core Learning Standards Tool.

- ▶ Students read standard RI.9-10.1.a.

① The 9.3 Common Core Learning Standards Tool was distributed in 9.3.1, Lesson 1.

Explain that this standard is assessed because as part of today's lesson, students will generate and craft a variety of inquiry questions including *factual*, *interpretive*, and *evaluative* questions. As necessary, explain to students the definitions of *factual* ("based on or restricted to facts"), *interpretive* ("serving to explain or provide the meaning of"), and *evaluative* ("serving to determine the significance, worth, or quality of questions").

Explain that later in the lesson students will craft specific inquiry questions that explore their topics through these types of questions.

- ▶ Students listen.

Activity 2: Homework Accountability

5%

Direct students to take out the Pre-Search Tool from the previous lesson's homework. Instruct students to form pairs and share two sources they discovered relating to the research question/problem and explain how the two sources connect to the research question/problem.

- 💬 Student responses will vary based on individual student's research question/problem. Sample responses might sound like the following:

- I found an article, “Think You’re Smarter Than Animals? Maybe Not,” that it is about animals being more intelligent than humans. It fits with my research question/problem because I am looking to compare animal and human intelligence.
- I found an article, “Monkeys Can Perform Mental Addition,” that it is about monkeys being able to perform mental math. Monkeys can mentally manipulate representations of numbers to add. This fits with my research question/problem because it is one example of animals that perform the same type of thinking that humans do. This relates to my research question/problem because I am comparing animal and human intelligence.

① Consider circulating during the partner discussion to monitor students’ homework completion.

Activity 3: Research Process Check-In

5%

Explain that students will be tracking the research process at the beginning of most lessons to ensure they understand the research steps, their questions are answered, their concerns are addressed, and progress is made. Instruct students to take out their Research Portfolios.

- ▶ Students listen and take out their Research Portfolios.

① Research Portfolios were developed in the previous lesson.

Distribute the Student Research Plan to each student. Explain that this plan helps them track their research progress by describing the research process outcomes they should see at each step, and supporting students in journaling about their research progress and next steps. Remind students that the research process is iterative and cyclical, as the Research Plan indicates. There are specific steps that are “completed,” but many steps in the process will need to be repeated or returned to because research develops and builds on itself and can lead to different paths that may need to be explored.

- ▶ Students listen and examine the Student Research Plan.

① Consider defining the word *cyclical* (“recurring or evolving in cycles”) for students so they understand the research process is a cycle and not a linear process.

Instruct students to examine Part 1 of the Student Research Plan. Remind them that some of these research processes were conducted in Unit 1.

① The research processes addressed in Part 1 of the Student Research Plan will be completed in this lesson and students will journal about their research progress and next steps in the following lesson using the Student Research Plan.

Instruct students to file the Student Research Plan in the front of the Research Portfolio in Section 1.

Activity 4: Inquiry Questions Review

10%

Instruct students to do a Turn-and-Talk to review inquiry questions (taught in Unit 9.3.1) by answering the following questions.

What is the purpose of asking inquiry questions?

- 💬 Student responses may include the following:
 - To guide an exploration of a topic by identifying the various aspects of a topic through questions.
 - To use for pre-searches to find out information you want to know.
 - The inquiry questions can allow you to identify which parts of the topic provide the most relevant and rich information, while also helping identify which parts of the topic may not be useful or pertinent.

What are key components of effective inquiry questions?

- 💬 Student responses may include the following:
 - The questions should lead to rich and relevant knowledge and information.
 - They should be questions you want to answer.
 - They are questions that can truly be answered through research.
 - They should be questions that are clear or easily understood.
 - The questions should lead to multiple answers or more questions.
 - They are questions that you do not already know the answer to.
- ① **Differentiation Consideration:** If students need help with this review, instruct them to reference the Posing Inquiry Questions Handout from Unit 9.3.1, Lesson 3.
 - ① Consider reminding students of the language of standard RI.9-10.1.a discussed in the lesson opening. The inquiry questions they develop should seek answers regarding facts, explanation/understanding, and evaluation. There should be several inquiry questions developed in each of these categories.
 - ① Consider writing notes from the discussion for students to see and apply during the small group brainstorm.

Remind students that, in Unit 1, they posed inquiry questions as an exploratory process to identify general areas of interest and confirm that a topic or area of investigation could be supported through research. The questions were more general in nature. The role and nature of the inquiry questions change now that students have established a research problem/question. The questions become more specific, the “frame” to guide the exploration of the research question/problem. Explain to students that the focus of the following activity, the small group brainstorm, is to generate inquiry questions. Students

should try to think about specific inquiry questions but the goal of the brainstorm is to generate a large number of questions. Later in the lesson, students will vet the questions for specificity.

- ▶ Students listen.

Share with students the model research question/problem from Lesson 1: How does animal intelligence compare to human intelligence?

- ▶ Students listen.

Instruct students to form pairs to do a Turn-and-Talk about three possible inquiry questions that might frame effective research for the model research question/problem.

Lead a share out of the possible inquiry questions and write them on the board or chart paper as examples for students to see.

🗨 Student responses may include the following:

- Do animals think like humans?
- Can animals make decisions?
- How can we measure animal intelligence?
- Why should animal intelligence be explored?
- What characteristics do animals and humans share when it comes to intelligence?

① At this point in the lesson, the sample student responses do not need to be ideal inquiry questions yet. Later in the lesson, students will vet questions and refine them into stronger and more specific inquiry questions that yield more than yes/no answers.

Activity 5: Small Group Brainstorm

30%

Inform students they will participate in a small group brainstorm to help them generate inquiry questions that explore as many possible aspects of their individual research question/problem as possible. The goal is for each student to walk away from the brainstorm with a plentiful volume of questions that can later be condensed and refined to frame their specific research question/problem. Remind students that the questions could be seeking factual answers, explanation, understanding, or evaluation, or a combination of some or any of these.

- ▶ Students listen.

Explain the directions for the small group brainstorm. Each student in the small group presents their research question/problem to the group. The group then generates as many inquiry questions as possible for that individual student's research question/problem. The student presenting a research

question/problem records the questions the group has brainstormed. The process continues until all students have presented their individual research question/problem and the rest of the group has brainstormed questions.

- ▶ Students listen.

TA*Explain to students that in this lesson, they will continue the work of collaborative discussion outlined in SL.9-10.1, to which students were previously introduced. Remind students these discussion strategies have been taught in previous modules.

SA*Students listen.

Instruct students to transition into small groups and complete the inquiry question brainstorm for each student in the group.

- ☛ Student questions will vary; questions brainstormed depend on the students' individual research questions/problems.

- ① Students learned about crafting and refining inquiry questions in Unit 1. However, if students struggle during the small group activity to brainstorm effective inquiry questions, consider using the Specific Inquiry Questions Checklist when circulating to support students who are struggling. Recommend that students consider the checklist's criteria when brainstorming possible inquiry questions.
- ① Encourage students to build on and borrow questions from each other as they brainstorm. Many research questions/problems may be related since all of the students generated their areas of investigation from the Grandin text in Unit 1.
- ① Consider reassuring students that they should not worry about the specificity of the questions right now; for the purpose of the small group brainstorm, students need to help their peers generate as many inquiry questions as possible for their research problem/question.
- ① Consider reminding students of the skills inherent in the sub-standards of Standard SL.9-10.1, to which students were previously introduced.
- ① Consider placing students in small groups that will remain consistent throughout the module. 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.

Activity 6: Vetting Specific Inquiry Questions

20%

Transition students into a whole-class structure and distribute the Specific Inquiry Questions Checklist to each student. Explain to students that in this part of the lesson they use the Specific Inquiry Questions Checklist to vet, select, and refine at least five specific inquiry questions from the previous small group brainstorm activity.

- ▶ Students listen and examine the Specific Inquiry Questions Checklist.

Model for students how to use the Specific Inquiry Questions Checklist using a question brainstormed in the Inquiry Questions Review Activity (Activity #4).

Instruct students to look at the first question:

- Do animals think like humans?

Model for students how to evaluate the question using the Specific Inquiry Questions Checklist. In relation to the question, “Do animals think like humans?” instruct students to look at criterion #1:

- Does the question have an appropriate scope or purpose? Does it focus on an important aspect of the research question/problem?

Explain to students that this question seems repetitive of the actual research question/problem; the question does not focus on an aspect of the research question/problem. Instruct students to look at criterion #2 on the Specific Inquiry Questions Checklist:

- Is the question useful? Will it lead to meaningful inquiry?

Explain to students that the question is useful and could lead to meaningful inquiry but the scope feels too large. Instruct students to look at criterion #3:

- Is the question answerable through research?

Explain to students that it would be answerable through research. We could find information about animals thinking like humans. Instruct students to look at criterion #4:

- Is your question understandable or clear?

Explain to students that the question could be refined to be more specific. This question is understandable but still too large, which makes it unclear. What do we want to know specifically about how animals think like humans? Instruct students to look at criterion #5:

- Does your question require multiple answers and possibly more questions?

Explain to students that the question requires a yes/no answer and not multiple answers and so it does not fit this criterion. Instruct students to look at criterion #6:

- Is your question's answer unknown to you?

Explain to students that yes, the answer is unknown. At this point, there is exploring to be completed to find information about animals thinking like humans.

Model for students how to tailor the inquiry question to make it more specific, to focus on an aspect of the model research question/problem, and to make it require more than a yes/no answer. Explain to students that a way to alter the question is to think about the type of answers they want to get. Beginning a question with the word, "Can" requires the answer to be yes/no. Changing the beginning of the question can alter the answer they will get: How do animals show they can remember information?

- ▶ Students follow along with the teacher modeling.

Guide students through the Specific Inquiry Questions Checklist to vet the new inquiry question (How do animals show they can remember information?) by having them check off the appropriate categories on their checklist.

- ▶ Students independently practice vetting the new inquiry question by using the Specific Inquiry Questions Checklist.

① Consider having students practice vetting another question from the Inquiry Questions Review Activity (Activity #4) in pairs if students need more support.

Activity 7: Finalizing Specific Inquiry Questions

20%

Explain to students that they will now use the Specific Inquiry Questions Checklist to vet the inquiry questions from the small group brainstorm and finalize at least five questions for assessment purposes.

- ▶ Students listen.

Instruct students to individually examine their list of inquiry questions generated from the small group brainstorm activity and use the Specific Inquiry Questions Checklist to select, vet, and refine at least five specific inquiry questions.

- ① This process is appropriate for a lesson assessment because students previously crafted and refined inquiry questions in Unit 1.

Instruct students to choose two of the richest or strongest specific inquiry questions and copy the questions on a separate sheet of paper.

- ▶ Students complete the inquiry question assessment.
- ① Assess each student's two specific inquiry questions using the language of the Specific Inquiry Questions Checklist to provide feedback.
- ① If students struggle with choosing the richest or strongest specific inquiry questions, instruct them to think about choosing the inquiry questions that might lead to the richest inquiry or multiple sources of information.

Collect each student's two specific inquiry questions.

Instruct students to file their five specific inquiry questions in Section 1 (Defining an Area of Investigation) of the Research Portfolio.

Activity 8: Closing

5%

Display and distribute the homework assignment. For homework, instruct students to continue crafting, vetting, and refining five more specific inquiry questions for their research question/problem using the Specific Inquiry Questions Checklist.

- ▶ Students follow along.

Homework

Continue crafting, vetting, and refining five more specific inquiry questions for your research question/problem using the Specific Inquiry Questions Checklist.

Student Research Plan

Research Process	Process Outcomes	Associated Materials
Part 1: Initiating Inquiry	<ul style="list-style-type: none"> Generates, selects, and refines inquiry questions to explore topics. Develops 2–3 areas of investigation from the topic exploration. Develops inquiry questions about areas of investigation. Conducts pre-searches of areas of investigation. Arrives at a research question/problem by vetting areas of investigation. Generates specific inquiry questions for the research question/problem. 	<ul style="list-style-type: none"> Topic Tracking Tool Posing Inquiry Questions Handout Exploring a Topic Tool Pre-Search Tool Area Evaluation Checklist Specific Inquiry Questions Checklist
Part 2: Gathering Information	<ul style="list-style-type: none"> Plans for searches by determining key words/phrases and finding credible and relevant sources. Assesses sources for credibility, relevance, and accessibility. Annotates sources and records notes that will help answer the inquiry questions. Builds an initial Research Frame to guide independent searches. Conducts searches independently. 	<ul style="list-style-type: none"> Potential Sources Tool Assessing Sources Tool Assessing Sources Handout Taking Notes Tool Research Frame Conducting Independent Searches Checklist Independent Searches Self-Evaluation
Part 3: Organizing and Synthesizing Inquiry	<ul style="list-style-type: none"> Organizes, connects, and synthesizes evidence to develop evidence-based claims about inquiry questions and inquiry paths. Further organizes, connects, and 	<ul style="list-style-type: none"> Forming Evidence-Based Claims Tool Organizing Evidence-Based Claims Tool Evidence-Based Claims

Research Process	Process Outcomes	Associated Materials
	<p>synthesizes evidence-based claims about inquiry paths and the research question/problem itself.</p> <ul style="list-style-type: none">Reviews and synthesizes the research to develop a written evidence-based perspective.	<p>Criteria Checklist</p> <ul style="list-style-type: none">Evidence-Based Perspective Rubric

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Specific Inquiry Questions Checklist

Name:		Class:		Date:	
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Research Question/Problem (Area of Investigation):

Question #1: _____

Question #2: _____

Question #3: _____

Question #4: _____

Question #5: _____

Criteria	Q1	Q2	Q3	Q4	Q5
1. Does the question have an appropriate scope or purpose? (Does it focus on an important aspect of the research question/problem?)					
2. Is the question useful? Will it lead to meaningful inquiry?					

Criteria	Q1	Q2	Q3	Q4	Q5
3. Is the question understandable or clear?					
4. Is the question answerable through research?					
5. Does the question require multiple answers and possibly more questions?					
6. Is your question's answer unknown to you?					

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