Research Cycles: Upcycling Literacy through Authentic Literacy Opportunities

By Amy Carney Heath

Figure 1. Example of Student Recording Presentation for Step 6 of Research Cycle

Do you dream of creating authentic literacy opportunities for your students? During these opportunities, children use reading, writing, and talking in ways that are situated in the real world (Duke et al., 2006). After a successful year of implementing authentic literacy opportunities as a third-grade teacher in a suburban school district, I reflected on the process that I created: Research Cycles. Through Research Cycles, students chose to learn answers to their own questions. Twenty-seven students with diverse backgrounds, whether in capabilities, culture, socio-economic status, or religion, participated. Students' research included topics like how to code a dance party, how to write a travel blog, how to determine the gender of pine cones, how to grow crystals, and how to give CPR in emergency situations.

After working over a decade in the classroom, I realized that my students loved Science and Social Studies; however, I also realized that we rarely had time to learn these important subjects. We did not have time because we had implemented structural changes in our daily schedules to address recent legislative reforms. The structural changes meant that sometimes students received two to three doses of Reading, Writing, and Math per day. Who has time for Science? Who has time for Social Studies? Not me!

After reflecting on the needs of my students, I realized that I could integrate Literacy into Science and Social Studies through authentic learning opportunities. I tinkered with the idea of creating a system in the classroom. This process led to a routine system that could be repeated again and again. The system that worked for my classroom was Research Cycles. Below, I will define Research Cycles, explain how I taught my students to use Research Cycles, and provide a lesson plan template.

What is a Research Cycle?

What are Research Cycles? Research Cycles include concrete steps for independent student research and learning. These steps include questioning, choosing a question, reading for information, taking notes, interviewing an expert, and presenting. Research Cycles are an instantiation of inquiry-based instruction. Inquiry-based instruction is instruction centered on students' questions and curiosities. For example, Welsh (2019) engaged in a form of inquiry-based instruction entitled "Inquiry Cycles" in a second-grade Science inquiry unit which included three phrases (p. 725).

1. Phase One: Becoming aware and developing a conceptual focus with an anchor text.
2. Phase Two: Identifying problems/solutions with an additional anchor text.
3. Phase Three: Taking action with a text set (p. 725).

Through this process, the teacher asked the students to use "literacy tools as scientists use them" (p. 725). In addition, writing was used as a tool with guiding instructional principles: "central inquiry questions, active engagement with science phenomena, and interactive read-alouds" (p. 725). In this way, teachers used a central inquiry question to frame a science unit (p. 732). For example, "Why do we need to care for our air, water, and land" (p. 724)? Another example is "What are the differences between biotic and abiotic things in the environment" (p. 727)? These types of central inquiry questions frame a science unit.

Authentic literacy activities are at the core of Research Cycles (Piaget and Duckworth, 2012, Welsh et al., 2019, and Moje, 2015). Moje (2015) argued for the practice of inquiry and indicated discourse as vital to the learning of reading, writing, and speaking. Moje (2015) also argued this work occurred as teachers integrate literacy teaching practices in authentic ways. Further, Moje (2015) believed that teachers can apprentice students into understanding how to find purposeful literacy work in the day to day classroom. Through this apprenticeship process, students find significance in disciplinary reading, writing, and speaking. Moje (2015) defined authentic literacy activities as "uncovering, examining, practicing, challenging, and rebuilding the tools of knowledge production and critique" as learners saturated in inquiry gain inspiration for asking questions and drawing conclusions (p. 257). Why? Moje (2015) argued young children are connected in wonder about the world. The literature revealed the importance of authentic literacy activities, yet I wondered how this approach would look in my classroom. I wanted to develop a system that would allow students to lead and sustain their own learning. Over the course of learning from my students, I developed a cycle to streamline this process.

How did I apprentice my students through the Research Cycles?

I helped my students learn Research Cycles through a 6-step apprenticeship.

Step 1: Questioning

At the beginning of the school year, I asked for four black and white, marble, wide-ruled journals per student. I placed this request on the beginning of the year supply list for our families. I also asked for donations in case a family was not able to provide journals. In the journals, for the first Research Cycle, I encouraged students to write questions about the world in different ways. Students brain-stormed topics and wrote questions on topics for 5-10 minutes. Students were also encouraged to create questions as they read informational text during independent reading. In addition, after Science or Social Studies, students wrote questions. The initial questioning phase lasted for 2 weeks. After the initial phase, students used their questions to do research. When students completed a Research Cycle, the students returned to Step 1, reread questions, and wrote new questions.

Step 2: Choosing a Question

Students read through the questions and circled three questions for project work. Students ordered the questions and chose question number one for project work.

Step 3: Reading for Information

Before step three, I provided a series of mini lessons on primary and secondary resources. Students sorted primary and secondary resources and learned how to find primary resources. Students reread the chosen question and underlined the keywords in the questions. Students looked for primary resources via books in the library and digital resources to learn more about the topic. Students also used search engines like Google or Google Voice to search for information. The goal was three to five primary resources on a topic. After the initial introduction to Step 3, students were encouraged to find resources for their questions.

Step 4: Taking Notes

During this step, students read and listened to resources to find answers to the research question. As students read, students created notes on the information in Google Slides. Students were encouraged to create three to five slides with information. If students did not know how to type, they were encouraged to voice type. The final slide included the titles and authors of resources. During this step, I invited the librarian to do a series of mini lessons on plagiarism, and we also learned about using quotation marks to copy quotes.

Step 5: Interviewing an Expert

If the student could not find answers to the question during the research process, students were encouraged to create more questions around the question. Then, students were encouraged to call an expert. Students determined experts through the research process. For example, one student wanted to learn about diamonds. In her research, she learned that diamonds are at jewelry stores, so she asked to call the jewelry store to learn more about diamonds. Another student was interested in the gender of pine cones. Through her research, she read about trees on the United States Forest website. The first expert could not answer her questions but that expert led her to another tree expert that provided insight. When it was time to call the expert, the teacher sat with the students to introduce the work to the expert. Then, the student took over with the questions and took notes and inserted the findings into the presentation.

Step 6: Presentation

Students presented the work to the class via Seesaw. The Seesaw app provided opportunities for discourse as well as provided a platform for the creation of student portfolios. In real time, families viewed student work and even engaged with the content through positive feedback. Students also posted positive feedback. In addition, students had opportunities to create video presentations with a green screen and posted the presentations on Seesaw. For example, if a student created a presentation on polar bears, the Green Screen may be the habitat of polar bears. If a student created a presentation on the moon, the Green Screen may make it appear the student is walking on the moon. At this point, students worked together to record one another's presentations. When students finished the work, the students were immediately encouraged to look at their journal and choose the next research question to start the cycle again. Below, I provided a lesson plan template in Table 1.

Table 1
Sample Lesson Plans for Research Cycles

<table>
<tr><th colspan="2">Before Research Cycles</th></tr>
<tr><td>Materials: Journals, Pens, Pencils, Colored Pencils, Author Chair

Introduction:
Before the teacher starts Research Cycles, the teacher must do some prep work with the students. First, the teacher creates “I wonder” anchor charts. For this task, the teacher asks the students what they are wondering about. The teacher records exactly what the student says and gives the student credit for the idea. The teacher also uses the opportunity to model quotation marks and other punctuation. The teacher writes the “I wonder” anchor chart on chart paper and allows the students to dictate the teacher’s writing. The teacher rereads the anchor charts with the students.

The teacher completes an “I wonder” chart with the students and provides an opportunity for each student to respond.</td><td>Example of “I wonder” Anchor Chart:

1. Lucy said, “I wonder about volcanoes.”
2. Trinity said, “I wonder about the gender of pine cones.”
3. Bryan said, “I wonder about planets.”
4. Monica said, “I wonder why dogs bark.”
5. Joe said, “I wonder how motors work.”
6. Jesse said, “I wonder about ocean waves.”
7. Leslie said, “I wonder about the Anasazi Indians.”
8. Zane said, “I wonder about the Grand Canyon.”
9. Maria said, “I wonder about diamonds.”
10. Jack said, “I wonder about rubies.”
11. Earl said, “I wonder about race cars.”
12. Amelia said, “I wonder how snowflakes are made.”
13. Mark said, “I wonder why race cars are made different.”
14. Abigail said, “I wonder how tornadoes form.”</td></tr>
<tr><td>After each student responds to an anchor chart, the students sort the ideas by themes.</td><td>Examples of Themes:

Theme #1: Rocks and Minerals
1. Zane said, “I wonder about the Grand Canyon."
2. Maria said, “I wonder about diamonds.”
3. Jack said, “I wonder about rubies.”
4. Lucy said, “I wonder about volcanoes.”

Theme #2: Motors and Cars
1. Joe said, “I wonder how motors work.”
2. Earl said, “I wonder about race cars.”
3. Mark said, “I wonder why race cars are made different.”</td></tr>
</table>

Research Cycles: Example of Lesson Plan		
Step 1-2	After you have a theme, you use the students' ideas to start teaching the process of the research cycle. You create a new anchor chart with students' questions about the theme. For the theme of Rocks and Minerals, students designed the question, "How are rocks formed?" Ask all of the students to write the question with their name on a sticky note. Ask students to underline the key word "rocks." Ask the students to place the sticky note under "Step 1" on the Choice Board. The question guides the next step: "Step 2". Create a text set on Rocks. Students move their post-it note to "Step 3." Check out all of the books on Rocks from the library. Ask the students, "How should I sort these books?" Before you sort the books, introduce the terms primary and secondary resources. Write the terms on large sentence strips. Place the sentence strips on the rug. Intentionally, teach the students the definitions of primary and secondary resources. Tell students that primary resources are resources that are created by a Geologist or created at the time of learning about the information. Examples of primary resources include artifacts, documents, diaries, and autobiographies. Secondary resources are resources that were created by someone who did not learn the information first hand. The information was created by someone else. Have a stack of primary and secondary resources, and ask your students to sort them. The next day, have different stacks of primary and secondary resources with sentence strips that read primary and secondary resources. Place your students in small groups. Ask the small groups to sort the primary and secondary resources. After all groups finish sorting resources, ask your class to walk the room and discuss what they learned about primary and secondary resources.	**Example of Anchor chart Title: Primary versus Secondary Resource**
Step 3	Sort the Rock books and information into primary and secondary resources. Ask the students to choose three resources for the next step. Write the titles of the three resources on chart paper.	**Example of Anchor Chart Title: Rock Resources** **1.** **2.** **3.**

Research Cycles: Example of Lesson Plan		
Step 4	After the students choose the resources, the teacher may read the books with the students. At this point, the teacher models how to write facts from the text. This is "Step 4." Make sure all of the students move their post-it note to "Step 4." The teacher models how to give the author of the resource credit for their ideas. The teacher also discusses how to write quotes from the text. The teacher models how to copy the exact words from the texts and place quotation marks around the text. The teacher and students work through three books.	
Step 5	The students move their post-it notes to "Step 5." The teacher types the facts for the students. The students "choral" read the facts. This means the students read the facts together. Then, the teacher asks the students if there is an expert. The teacher guides the students to consider a jeweler. Before this lesson, the teacher has already called the local jewelry store, and they have sent a jeweler to teach the students about rocks and minerals, and they bring rocks and minerals. This step is Research Cycle magic. The students are not expecting an expert to visit, and voila, an expert visits. The students listen and ask questions. After the jeweler leaves, the teacher asks the students to write what they learned in their journal. The teacher encourages the students to draw pictures of their learning. At the end of this special time, the teacher invites the students to share their learning in the Author's Chair.	
Step 6	The teacher shows the students Google Slides. The teacher models how to write one fact per slide. The teacher asks the students about what else they could put on the slide. A picture of the jeweler? Yes! Pictures of the Rocks and Minerals? Yes! Listen to the students and allow them to guide the creation of the presentation. Then, ask for a brave volunteer to present the information. After this step, post the presentation on Seesaw and allow the students to add additional information that they learned.	

Research Cycle Indpendent Work Begins		
Step 1-6	This day is an exciting day. On this day, students will write questions in their journals. Provide 5 minutes of "Free Write" time. At the end of this time, invite students to share their questions. Ask students to choose 1 question. Ask students to underline the keywords in their question. Circle the question in the journal, and write a new sticky note with their question and name. The students place their sticky note under "Step 1." After the question is chosen, students are encouraged to research, "Step 2.". The students may use books in the classroom, use their computer, or request to go to the library. The students are encouraged to find three resources and read about their topic. In addition, students move their post-it to "Step 3." Once the students finish reading, the students write 5-10 facts about what they learned and move to "Step 4." Keep in mind that each student will arrive at this place at a different time. Next, students are encouraged to find an expert, "Step 5." Before students make contact with experts, the teacher approves the expert and the interview questions. I encourage students to have a list of ten questions to ask the expert. Once the questions are designed, the student calls the expert and writes notes. Last, "Step 6" involves sharing what the student learned. The student may share information in-person in the Author's Chair or on Seesaw. Other students may ask questions in-person or on Seesaw which sometimes leads to further research. Once the student finishes all of the steps of the Research Cycle, the student is encouraged to return to their journal and review their questions. Students choose a new question and start the Research Cycle again. All students will be at different places in the Research Cycle throughout the year.	**Example Prompts for Questions in Journals:** 1. What are you wondering about? List questions of topics you are wondering about. 2. What are you wondering about rocks? 3. What are you wondering about vehicles? 4. What are you wondering about Space? 5. What are you wondering about animals? 6. What are you wondering about electricity? 7. What are you wondering about earthquakes? **Tip: Read your state standards. Design questions based on your standards.**

Table 2
Examples of Independent Student Work

Example Artifact(s)
*Learned how to code and coded a dance party.
*Researched information about Spain, traveled to Spain, and maintained a blog while in Spain.
*Visited a Ruby Bridges museum exhibit and studied Ruby Bridges. This student wrote, "When Ruby Bridges was in Kindergarten, she taught black and white people they could live together."
*Researchers were curious about slime and invented different kinds of slimes and wrote about it. In the book, the researchers included a Table of Contents.
*Research partners wondered, "Are pine cones male or female?" This answer could not be found in books and the partners found a pine cone expert at United States Forest and learned the answer to the question as well as tree experts who are called silviculturists.
*Persuaded the principal and cafeteria staff to play jazz music during lunch after research.
*Researchers read about crystals, grew crystals independently at home, and shared them with the class via microscope.
*Researched pandas and interviewed a panda expert at the Atlanta Zoo.
*Researchers investigated force and motion with beyblades and wrote about the discoveries after observation.
*Researchers learned about CPR and invited Bolt for the Heart to the classroom, so other students could learn. The research project was inspired when a family member suddenly died in his arms. Researchers created informational posters on CPR and displayed the posters around the school.

How did I facilitate research cycles?

Choice Board! In order to know where all students were in the process and for students to have ownership of their learning, I posted a choice board like Figure 1. On the choice board, I
posted the six steps of the research cycle. I provided post-it notes. Students wrote their name and question on the post-it note and moved it across the stages. With a quick glance, I knew everyone's research question and where they were in the Research Cycle.

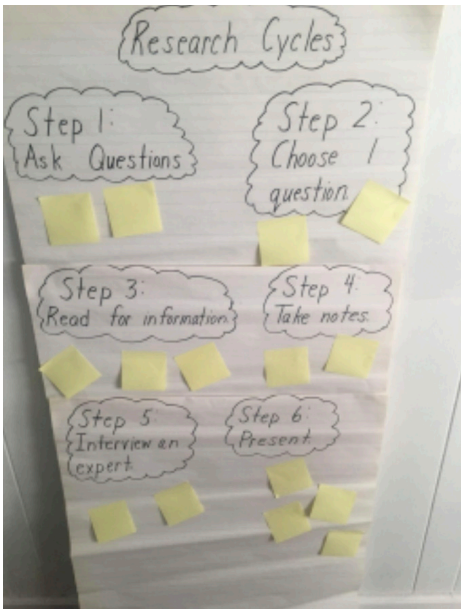

Figure 2. Example of Research Cycles Choice Board

Reflection

Research Cycles changed how my students engaged in meaningful work. After a successful year of my students implementing the research cycle, I noted the range of learning that occurred in my classroom. Some students created research questions from curiosity, and some students used informational texts. After the students selected their questions, some students found answers in books or media, and some students called experts because they could not find the answers in books or media. Some students presented work in-person, and some students opted to create video presentations. Research Cycles provided opportunities for students to grow as learners because students directed the learning. Even though all of my students were engaged in self-led independent work, all of the independent work varied in content. This means that the content for each project was different. For example, some students studied pine cones while other students learned about otters. The only similarity was that all work was completed through the same process, Research Cycles. Each day, I was challenged to upcycle my practice based on student interests and needs. For example, we had the library policy changed because students needed to go to the library more than once a week. I also allowed students to use my phone to call experts. As authentic learning opportunities ignited, the Research Cycles continued.

To get started with these authentic literacy opportunities in your classroom, create a research cycle anchor chart, a wonder anchor chart, and ask families to provide a black and white, marble, wide-ruled journal. Remember to encourage students to find the answers to their questions.

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