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Effects of Interdisciplinary Instruction on Students' Connection of Knowledge Across Learning Domains

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Effects of Interdisciplinary Instruction on Students' Connection of Knowledge in the Early Education Classroom

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Abstract

This research examines the use of interdisciplinary instruction in the early education classroom and how it impacts students' connection of knowledge across learning domains. This study looks specifically at a second-grade classroom in a midwestern state. The primary learning domains of social studies, science, mathematics, and language arts were focused on. The study is broken up into two phases: observation and implementation. Prior to the observation phase, a four-part interdisciplinary lesson plan on dinosaurs was created, including transition activities, vocabulary, state standards, and activities. After the creation of the lesson plans, the observation phase took place in which a typical day in the classroom was observed. Next, the implementation phase took place on a predetermined school day in March 2022. The teacher taught the predetermined lessons and the student's participation, body language, and responses were recorded and observed. The study found that interdisciplinary instruction can significantly increase engagement in the classroom. The study also found that a cross-content lesson structure can prompt student connections between subjects and create a learning environment that mirrors the way humans encounter problems outside of the classroom. Although the study shows positive impacts on the field of education, there are limitations within interdisciplinary instruction, and more research must be done to determine the extent to which it increases students' connection of knowledge.

Introduction

In the world of early education, best practices and recommendations are constantly changing to meet the needs of both the students and the world around them. With research and experience, educational practices are tested and observed to promote the most ideal learning environment for grades K to 5. This research project focuses on the educational outcomes of using a literacy-based resource to instruct students in all subject areas, also known as an interdisciplinary or multidisciplinary approach. In the field of education, lessons and instruction are traditionally given in a very rigid and divided approach that separates subject learning into distinct categories. When creating this divide in subject matter, students are taught to categorize their knowledge in separate boxes for each subject area, minimizing the connections made between their boxes of knowledge. State standards are even designed by content area and focus. However, the real world is not like this. Life outside the classroom is very fluid and mixes a wide variety of subject matters and contents into one situation. To produce learning environments that mirror the way that humans often encounter problems outside the classroom students should be taught in a method that creates connections across all subject domains, initiating a more realistic and applicable approach to education.

Review of Literature & Guiding Research Questions

After analyzing the need for interdisciplinary instruction within the context of K-5 education, there appears to be a need for high-quality resources that address all four of the learning domains. When searching using the keywords “interdisciplinary teaching materials K-5," the results primarily consisted of resources that expressed how to integrate two subjects together, such as “K-5 Mathematics Program Which Integrates Children's Literature” (Mink & Fraser, 2005). This integrated math program explains a study that was done using the SMILE

program, Science and Mathematics Integrated with Literary Experiences. The study aimed to determine whether this cross-disciplinary approach would positively influence the classroom environment and students' attitudes towards reading. The study found that the integrated content increases students' satisfaction and interest in the classroom but noted the lack of cohesion it may have produced due to the integrated content material (Mink & Fraser, 2005). Academic research provides reliable sources for the reflections and opinions on interdisciplinary teaching, such as the advantages and disadvantages to it. But academic journals and studies tend to lack the resources and lessons for teachers to directly implement in the classroom.

When teachers need help planning content lessons, they usually turn to people they know or a web browser for help. By searching on well-known websites, like the National Association for the Education of Young Children (NAEYC) and Scholastics, educators can find ideas and resources to support their teaching methods or instruction. NAEYC provides a variety of articles and related resources on using literacy to spring a multidisciplinary lesson. One article states that an “interdisciplinary approach using texts for authentic purposes can be more effective to promote disciplinary and literacy learning than traditional curricular models that separate reading and writing from other content areas” (Strachan & Block, 2020). The article demonstrates that interdisciplinary instruction can be more engaging for students and can produce a more motivating classroom environment that explores the social and natural world (Strachan & Block, 2020). NAEYC also has good suggestions on how to choose read-aloud stories. They suggest choosing read-aloud stories that have thematically rich issues, round characters, engaging illustrations, rich language, and a complex plot (Hoffman et al., 2015). On Scholastics, there is more content-related lesson plans that would be specifically helpful for teachers in the lesson planning process (The Teacher Store, n.d.). However, again, the resources and lesson plans only

contained a cross-disciplinary approach between two content areas, such as using literature to teach math. When searching for “interdisciplinary” and “multidisciplinary” on Scholastics, no results were shown.

When researching more broadly, a profound resource came up that is being used in preschool classrooms, Connect4Learning. Connect4Learning is a “research-based, classroom-tested interdisciplinary curriculum that consists of six units and 32 weeks of learning centers and lessons” (ECLKC, 2020) funded by the National Science Foundation. The program provides a sequence of learning experiences that progressively build children's knowledge and skills, making it easier for students to interact and engage with the curriculum. The program teaches across four domains (mathematics, science, literacy, and social and emotional learning) but lacks relation to social studies, health, and safety, and is specifically designed only for preschool (ECLKC, 2020). The curriculum was intended to “counter the frequent situation of devoting most preschool instructional time to literacy by having activities that join literacy with mathematics and science” (Sarama, 2016) with the hope of helping at-risk students. When in the revision stages, the pilot was tested in various classrooms and learning experiences, finding that the cross-disciplinary objectives “showed gains in mathematics, science, and literacy and a decrease in problem behaviors” (Sarama, 2016). Yet the resource is limited in its implication as it is a costly curriculum with application only in the preschool classroom, a grade level with more inclusive and adaptable state standards.

Beyond the lack of resources for teachers implementing integrated instruction, there is also a lack in the quality of resources. Many studies and research done on this topic are dated and lack relevance to our current education system. When searching for information, there was a lack of resources for “interdisciplinary” instruction. By switching to the term “thematic instruction,”

more research and resources were discovered to prompt a cross-disciplinary approach to teaching in the classroom. Although these terms are similar, thematic instruction is more researched as it is a widespread practice in elementary education. A study in Indonesia describes thematic learning as a way to integrate several subjects related to a theme. The study found that thematic learning is "more intact and meaningful" because it "makes a strong connection between abstract ideas" (Wardani et al., 2020, pg. 791). In Indonesia, thematic units are embedded in the curriculum as the "government determines the themes learned by students from grade 1 to 6 through thematic books shared" (Wardani et al., 2020, pg. 792). These books then serve as a guide for teachers when planning, teaching, and evaluating lessons. However, teachers have found flaws in the system as the themes are not always relatable and easily understandable (Wardani et al., 2020, pg. 797).

Interdisciplinary instruction takes thematic units one step further by integrating the content and curriculum material across subject areas rather than just the topic itself. Yet, this is a relatively new practice as the traditional structure of our schools and state standards divide content material into sections that are distinguishable between one another. Our school system runs into an issue when students enter the real world, and their experiences are not divided up by content area like they are taught in school. But rather they are intertwined with one another and coexist to create experiences that closely resemble situations outside the classroom. As schools attempt to reconcile the disconnect between the need for authentic learning environments and the structure of the education system, they created thematic units just as in Indonesia.

Thematic units provide a vast array of benefits for students while creating cross-content connections that equip students for the future. A study done at Sam Houston State University in 2010 demonstrates the effective use of thematic units for struggling readers. The study explained

that a thematic curriculum "enhanced education in a variety of ways, including facilitating learning by making connections to the real world; building schema; promoting higher-order thinking skills; and encouraging transfer of knowledge from one content area to another" (Hale, 2010, pg. 24). The researcher of the study also stated that thematic units have motivated and interested students in the classroom because the learning environment was purposeful (Hale, 2010, pg. 138). These outcomes of the curriculum design created effective instruction because the students were engaged and motivated to learn through effective learning environments. But as mentioned by the researcher, this practice is significantly under-researched, and the amount of research has not improved much since 2010.

A more recent study from 2021 discusses the benefits of thematic instruction during the pandemic and remote learning. The study found thematic instruction prompts more "memorable and profound" (Pujiastuti et al., pg. 2976) learning because focusing on a particular topic fosters subject competency. However, the study found that students had low satisfaction levels with the distance learning system because it induces stress and anxiety, but they realized this was the "best option during a pandemic" (Pujiastuti, Herwin, et al., 2021, pg. 2975). Thematic units closely resemble interdisciplinary instruction and demonstrate the benefits of students interacting with material that is relevant and interesting to their life outside of school. As many teachers and educational professionals can guess, the connection between content material and students' interests creates positive learning environments for both the teacher and student. Yet, the research field lacks concrete outcomes that support the use of this practice and how to directly link the lessons to state standards.

The research on cross-disciplinary content instruction shows a need for resources that are effective and include access to lesson planning tools that align with state standards. As the world

continues to change, more research on thematic and interdisciplinary instruction in the elementary classroom needs to be done to convey how students can reap these benefits within the structure of our education system.

Method

Purpose

The focus of this research study is to examine the benefits and limitations of students' connection of knowledge when taught in an interdisciplinary approach to learning. The research question is "What impact does an interdisciplinary lesson structure have on students' connection of knowledge from the four primary learning domains, language arts/reading, mathematics, science, and social studies, in the K-5 classroom?"

Design

The participants for this study were a second-grade teacher and a class of students at an elementary school in a midwestern state. To select the participants, a recruitment letter was sent out to teachers who were willing to participate and observe the impacts interdisciplinary instruction can have on students' connection of knowledge across subject domains. The student participants resulted from their teacher choosing and giving written signed consent to participate in the study. However, the students only provided an observational component to the study and no direct interactions with the researcher took place. In response to the teacher recruitment letter, there was tremendous support from one teacher, and they offered to partner up for this project. Therefore, their class of 14 second graders became the student participants. All participants were not required to participate in experiences beyond their everyday occurrences as early educators or young students.

During the early stages of the project, planning sessions occurred in which a collaborative environment was created to share ideas about potential lesson themes, standards, activities, and structure. These brainstorming sessions were vital to the creation of the four-part lesson plan as they merged information about specific second-grade students and the interdisciplinary content plans. After weeks of planning, a full-day interdisciplinary thematic unit was designed with state standards from all four learning domains, social studies, science, math, and English language arts.

After receiving written signed consent to instruct the integrated lesson plan in the classroom by the teacher and providing written informed consent to the students and their parents two weeks prior to the research being conducted, the study began. For the observation phase, the teacher and students were observed as they did two lessons in the classroom on a typical school day. The data gathered from this observation was used as a comparison point for what connections the students were making on a normal school day as opposed to the constructed thematic unit school day. As for the study, on a correlated day in late March 2022, the participating teacher instructed an interdisciplinary series of lessons based on a predetermined four-part lesson plan. With the help of their professional opinion and experience, they conducted the lesson how they saw fit as it would occur in regular teaching practice. The students' connection of knowledge was observed and recorded before, during, and after the lesson plans as presented through engagement, body language, verbal responses, nonverbal cues, completion of activities, and participation in class. The lessons were given over the course of one school day and observational research was conducted throughout the day, even when direct instruction was not given. Teachers, parents, and students were not contacted again after the completion of the study at the end of the designated school day.

Human Subject Protection

To protect anonymity, the students' names or faces will not appear in the research data. Students were given pseudonyms when quoted in the results, but their identity was not included in the research. To protect confidentiality, the observational typed data was kept in an electronic folder on a password-protected computer and written signed consent forms were kept in a locked office in a locked file cabinet on Bowling Green State University's campus. The data will be discarded after seven years. The study received approval from the Bowling Green State University Institutional Review Board (IRB) on February 7, 2022.

Findings

The first phase of this study was the observation phase which served as a comparison of data recorded in the implementation phase. As with most early education classrooms, this teacher has routine content lessons that are taught daily. During the reading and math lesson in this second-grade classroom, there were very few, if any, connections across content areas. The reading lesson focused on nonfiction text features and consisted of a read-aloud with several interactive and questioning techniques to engage students and encourage deeper thought about the structure of the book along with the story itself. Immediately after the short reading lesson, the teacher transitioned into "number corner." Number corner is a routine practice in this classroom as part of the Bridges curriculum where the students focus on the day of the week/month. Within the calendar focus, the teacher employs various discussions and activities that pertain to the day of the week/month. This lesson contained many mathematical topics such as money, equations, geometric shapes, fractions, and place values. However, the short lesson was completely distinct from the reading lesson before it and did not reference any other concepts aside from the subject it focused on. Throughout these lessons, the teacher

demonstrated many effective teaching practices such as questioning, verbal reminders, interactive games, technology, embedded intervention, and redirection. Yet, interdisciplinary instruction was not among one of these teaching practices.

As for student connections across subject areas, there were not many observed when listening to the students respond during their routine content lessons. During the reading lesson, the teacher asked a content question regarding how caterpillars turn into butterflies and student T responded by referencing a specific page in a book read earlier in the week. Although this connection did not cross content areas, the student was able to reference a separate learning occurrence that related to the question being asked. When speaking with the teacher throughout the planning of this study, they expressed that content lesson plans are distinct from one another meaning when one ends the other begins with minimal connections between the two. They also stated that the curriculum is often separated by content area and time blocks throughout the day. Furthermore, the students make connections between the content and their own experiences but rarely see how subject areas intertwine with one another.

On March 30, 2022, the implementation phase took place. The teacher taught the full four-part lesson plan within a complete school day (see Appendix A). When the students walked into the classroom, they had big smiles and wide eyes as they noticed the dinosaur references around the room. Throughout the day, many students stated that this day was completely different than their normal school day. For example, student T stated that “today is nothing like a normal day,” student P stated that “today is a super fun day, we would never do this,” and student X stated that “today is a special day.” During the beginning lesson of the day, the students received their “Paleontologist File” and were actively participating by raising their

hands to share their prior knowledge and experiences as they related to dinosaurs and the story of Mary Anning (see Appendix F).

During the first lesson of the day, social studies, the students were answering questions, following along, and maintaining eye contact during the timeline activity but began to either dose off or work ahead as they were asked to fill in their own timeline (see Appendix B). When asked to give a definition of timeline, student X flipped to the back of their Paleontologist File and read off the definition stated in the glossary. As the teacher transitioned into the next lesson, science, the students quickly regained eye contact, big eyes, and smiles as they heard "chocolate chip cookies" (see Appendix C). When the teacher began asking questions regarding fossil hunting and paleontology, student A stated that "we need to dig carefully and use tools like a chisel." When the students started the cookie dig activity, they took on the paleontologist persona and were very gentle and calm as they dug. One student stated that their fossils "looked like dinosaur poo." This statement sparked conversation regarding Mary Anning and her coprolite findings. Moreover, student K began counting how many fossils they had found and organizing math equations by asking "how many fossils they would have left, if they ate 2." All students were also asked to write about their findings using complete sentences in their observation journal.

After lunch and recess, the students were talkative so transitioning into the last two lessons of the day was more difficult than in the morning. After taking some deep breaths, the teacher began the next lesson of the day, math (see Appendix D). When introducing the concept of size and how the length of the dinosaurs was important, student R flipped back to the article in their Paleontologist File to identify the size of the dinosaurs they had read about in the Mary Anning story. As the lesson proceeded, the students made connections to the perspective of a

paleontologist. When asked what the size of the fossils could tell them, student T said, “if they were all the same size, we wouldn’t know which ones they are,” student R said, “to find out if it is a rib bone or what bone it is,” and student P said, “to find out small and big bones.” After this discussion, the students went outside and used measurement tools to find the total length of the two fossil replicas Mary Anning discovered. The students were interested in the activity but eager to play on the playground afterward.

In the final lesson of the day, language arts, the teacher reintroduced some of the vocabulary and referenced nonfiction text features, such as the glossary in the Paleontologist File (see Appendix E). The students remembered many of the terms used in previous lessons throughout the day and were able to properly use them when talking or researching. For the last lesson, the students chose their own dinosaur to research using books online or from the classroom library. The students understood that the main purpose of a paleontologist is to collect information to share with the world, which is exactly what they did at the end of the day. All students had the opportunity to share information about their dinosaur of choice. Student T stated, “mine is the Spinosaurus it is 60ft and around 70 tons.” Student R stated, “my dinosaur is almost as long as 2 school buses and weighs as much as two elephants.” As the day quickly ended, the students finished their KWL chart and reviewed what they learned during all the lessons (see appendix A). Student C stated that they learned that “Mary Anning discovered fossils.” Student T stated that they learned that “some dinosaurs have big teeth.” Student R said that they learned that “Mary Anning was the first paleontologist.” From the data collected in their exit slips, 10/12 students stated that they learned “Mary Anning was the first paleontologist” (see appendix G).

Implications for Future Research and Practice

Within these findings, there was an increase in engagement from the observation to the implementation phase. During the lessons in the implementation phase, the students were actively participating, maintaining eye contact, talking among their peers, asking questions, and sharing comments of excitement and awe. In terms of connections across content areas, there was also an increase from the observation phase to the implementation phase. During the "normal" school day, students were not asked to reference activities, information, or curiosities from previous lessons in the day. They were also not required to create links between the subjects because the learning areas were not designed to be relevant to each other. Furthermore, the students did not previously make verbal statements that connected a current lesson to a lesson in a previous subject unless specifically asked by the teacher.

In the first full lesson of the day during the implementation phase, social studies, there were few connections made between other subjects as it was the first lesson. However, the students made it apparent that this structure of the day was completely different than a normal day; a subject or theme that is of interest to them is not usually the sole focus of the learning content. One student also engaged in an unconscious language arts connection when they used the glossary to define a term asked by the teacher. This act of referencing nonfiction text features available to them demonstrates they understand these resources can be helpful to all areas of learning, not just reading or writing. During the science lesson, the students also demonstrated connections across content areas. For example, while practicing digging the "fossils" out of the cookies, the students were patient and persistent as a paleontologist would be. This demeanor and persistence could be in relation to the knowledge they learned about Mary Anning in the story or a connection to their prior knowledge of paleontology or the use of fine motor skills. One specific social studies connection that a student made was in relation to Mary Anning's

findings of fossilized poop. A student stated that their fossils looked like poop making a connection to the coprolite discussion that the class had during the previous lesson. Furthermore, a different student created a math connection as they counted their fossil findings and set up equations in their head by eating some of the "fossils" and subtracting how many total fossils they had. The students also practiced their grammar during this lesson when they were asked to write complete sentences in their observation journal about their findings. They were reminded to use capitalization and punctuation as needed.

In the second half of the day, the students continued to make connections to previous content that was either learned or talked about earlier in the day. For example, as the teacher transitioned into the math lesson, a student flipped back to the article read in social studies to learn about the lengths of the dinosaurs in feet. Again, by referencing text features, the student understands that these resources can be used to find information in all subject areas, such as measurement in math. During the math lesson, the students were able to connect these findings back to Mary Anning and ask and answer questions regarding what mathematical principles could play a role in paleontology, such as in the identification and labeling process of categorizing bones. During the final lesson, language arts, the students were able to complete a comprehensive activity in which they practiced being a paleontologist by researching and sharing their own findings. During this lesson, the students referenced key details about previous lessons when going over the vocabulary and used the terms in both their receptive and expressive language. At the end of the day, the students were eager to share what they learned. From the data collected in their exit slips, almost all students stated that they learned "Mary Anning was the first paleontologist." This fact was stated at the beginning of the day during the reading of the book, *Dinosaur Lady,* and was the theme of all the lessons. By the students remembering and

restating this fact, they demonstrate that they learned and understood the main concept of the day and how it fits into all the activities they completed.

Throughout this study, some limitations did arise. One of the most apparent drawbacks was the change in routine. Two students in this classroom have autism and are dependent on schedules and routines to maintain a calm and predictable environment. With the deviation in schedule and activities, these two students were more overwhelmed and confused than they usually are. This increase in difficulties was apparent because of the change in routine. However, if this instruction were embedded daily into common routines and practices, this drawback would not have been as impactful as it was in the study. Another limitation of interdisciplinary instruction is the need to create content and themes that are interesting for students of a particular age. Since children around eight years old enjoy learning about dinosaurs and bones this day was overly exciting for them. But as the year goes on, it may become difficult to find thematic topics that are both engaging for students and connected to learning standards in all subject domains. Finally, a specific limitation seen in this study was the overload of content and material. If the study were repeated, the activities should be simpler and require fewer transitions. Often, the teacher ran out of time and moved on to a new activity, before the previous one was complete. With an overload of material and concepts to cover, students may become overwhelmed and less likely to see the connections between subject areas. Furthermore, if the study was repeated, more time should be dedicated to asking and answering questions that specifically link subjects together rather than prompting students to make these connections on their own. Teachers want to create authentic learning environments for students to explore and engage with but there is nothing wrong with steering students in the right direction.

Although the students showed various connections between subject areas, this was just one day out of their learning. To conclude that interdisciplinary instruction does significantly increase student connections across learning domains, more research must be done. In terms of best practices in the early education classroom today, interdisciplinary and thematic instruction are significantly under-researched and underused by educators. At the bare minimum, this technique has been shown to increase engagement within the classroom through positive facial expressions and more active participation, which is one of the main goals of an elementary educator. Furthermore, this practice links standards from all domains while interrelating concepts and time blocks that are usually distinct from one another. As the world continues to change, both teachers and administrators must prioritize effective and engaging materials that make learning exciting and impactful for all students.

Conclusion

Within the teaching field, there are various opinions and ideas on how to best instruct and support students in and out of the classroom. With all the subjectivity in the field, often time educators fall back on research and statistics to determine best practice. Interdisciplinary and thematic instruction is an area that is "unresearched in recent years" (Hale, 2010, pg. 141) as the research is dated or lacks high quality lesson planning resources in all four primary learning domains. With a lack of evidence, less educators are prompted to implement and reference this teaching method. Furthermore, school administrators are less likely to promote this practice through curriculum outlines and instruction requirements as it is not a widely used practice in early education. Interdisciplinary instruction is a technique that can significantly impact students in the early education classroom. With an abundance of connection and cross-content relations, students are more likely to experience learning environments that resemble the real world.

Students may also be more engaged and interactive with the material as it builds off both prior knowledge and previously learned content. With an increase in engaging content and connected curriculum, students will be more likely to enjoy learning and will be better equipped for life after school.

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Appendix A

Full Day Schedule

Thematic Dinosaur 4-Part Less Plan Schedule:

1. Start of the Day:

Materials	Paper bowls Yarn/string Hole Punch Markers “Paleontologist File” - KWL and Glossary
Introduction Mini Lesson	• Before students enter the class, the teacher will have materials set out for the students at their desk (pre hole punched bowl, markers, and piece of string). • Welcome students and tell them today they are going to be paleontologists! • Ask students if they know what paleontologists are and have them share what they know. • Explain to students that they are going to create their own paleontologist hat to wear all day today. • Have students decorate their bowl and the teacher/adults will help attach the string to their hat. • Once all students finish their hats, pass out their “Paleontologists Files” that have all the work they are going to complete for the day. Tell students they must keep this file safe throughout the day, so they do not lose any of their first work as paleontologists. • Have students write their name and date on the front cover of the file. • The teacher will then lead a KWL about the topic dinosaurs and prehistoric creatures. Have students fill out what they already know and then share out with the class after a couple minutes. Next, students write what they wonder/want to know about dinosaurs and prehistoric creatures and share out again after a few minutes. Students will revisit their KWL at the end of the day to record what they have learned. May need to have a discussion about what prehistoric means, students can reference their glossary in the back of their file for the definition. • Introduce vocabulary for the day- have students turn to the second to last page in the file (Glossary) and follow along as the

	teacher goes through the vocabulary terms. Ensure terms are posted in the classroom for students to reference all throughout the day. They can also flip to the back of their file to reference them individually. • Transition students to the carpet for the read aloud. Time Allotted: 25 Minutes

2. Social Studies Lesson: Social Studies Lesson Plan 2.docx
3. Science Lesson: Science Lesson Plan.docx
    a. Dinosaur ancestry- https://www.nhm.ac.uk/discover/why-are-birds-the-only-surviving-dinosaurs.html
    b. How fossils are formed- https://www.nhm.ac.uk/discover/how-are-fossils-formed.html
4. Math Lesson: Math Lesson Plan.docx
5. ELA Lesson: ELA Lesson Plan.docx
6. End of the Day:

Materials	Pencils Stamps "Paleontologist File" – KWL worksheet Paleontology Certificate and candy bag Exit Slip Survey
Closing Mini Lesson	• Ask students what their favorite part of the day was and why. Ask students to share what they learned during that part of the day/activity. • Pause the discussion after everyone has shared who wanted to and have students fill out the "what did you learn" (third section) section of the KWL chart they started at the beginning of the day. • Vocab review: as the teacher reads the vocabulary terms, ask students to explain or describe an event or activity that pertained to that word during the lessons today. Continue asking students to make connections between the vocabulary and the activities completed throughout the day in each subject. • Ask students who would consider being a paleontologist in the future. Give students a certification of paleontology along with a bag of candy for all their hard work today. Stamp student's Paleontologist Files to make it "official" documentation of their work as paleontologist. • Have students complete the end of day exit slip before leaving.

	Time Allotted: 20 Minutes

Appendix B

Social Studies Lesson

Name	Karley Becker				
Subject/Learner	2nd Grade Social Studies				
Content Focus (Unit Theme)	Dinosaurs / Prehistoric Animals				
Date of Lesson	**3/30/2022**	**# of Students**	**20**	**AM/PM All day**	**AM**

Learning Target	
Ohio Learning Standards Early Learning Standards	Theme: People Working Together Strand: History Strand Topic: Historic Thinking and Skills Content Statement: Time can be shown graphically on calendars and timelines. Theme: People Working Together Strand: History Strand Topic: Heritage Content Statement: Biographies can show how peoples' actions have shaped the world in which we live.
IEP Goal (or 504, Gifted, Other Learning Needs)	The student will be able to read and answer comprehension questions about a text with 80% accuracy in 4 out of 5 trials as measured by teacher records.
Lesson Objective - must align with standards	Students will be able to construct a timeline of events 2 out of 3 times by the end of the year. Students will be able to identify a biography through different mediums with no more than two verbal prompts by the end of the year.
Assessments - must align with objectives. Include all formative and summative assessments for the lesson and documentation of evidence	Informal assessment checks of student's work, motivation/attention, and accuracy throughout the activity and during share out/wrap up discussions. Keep anecdotal recording of how well students complete the last two events on the timeline (date/event accuracy and chronological order).

Instructional Strategies	
Academic Vocabulary (focus learner vocabulary for the lesson with definitions)	**Ancestor**: an early living thing that something descended from **Biography**: an account of someone's life written by someone else **Bones**: hard tissue making up a skeleton **Chisel**: hand tool used to cut or shape **Discover**: to find **Fossils**: preserved physical traces of past living things **Museum**: building in which historical objects are stored **Paleontologist**: scientist who studies fossils **Prehistoric**: time before written records **Scientists**: a person who studies science **Timeline**: a tool that organizes events in order
Universal Design Strategies (Presentation, Expression, Engagement) to reach all learners	**Presentation**: Visual and auditory learning through discussion and written ideas, written ideas will stay on the board so students can reference them throughout the day, and the book, *Dinosaur Lady*, will provide a basis for presenting ideas, visuals, and information all day. **Expression**: Students will be actively involved in discussion and activity, students have the chance to share their own opinions, work in groups, and hear the work of their peers. **Engagement**: Dinosaurs are an interesting topic that most people do not know much about so it will spark curiosity in the students throughout the lesson. Students will also feel confident as they can fill out the timeline (dates and descriptions) with the informational passage given to them.
Classroom Management Strategies (grouping, transitions, attention signals)	**Grouping**: Students will work in groups of 3 or 4 to complete the last two events on the timeline. They can share work with their peers but also have the resources to complete the activity independently so there is a dependence on both themselves and their peers. **Transitions**: Students will remain in their seat during this lesson so there will be minimal physical transitions. In between directions, the teacher will use the bell to aid in transitioning.

	Attention Signals: Bell in front and back of the room to gain student's attention in between or during activities/lessons.
Materials and Resources List Include any worksheets or craft examples that will be used in the lesson (if needed attach at the end of the lesson plan). Insert YouTube or Pinterest or any other link to a web-based resource.	Book: *DINOSAUR LADY: The Daring Discoveries of Mary Anning, the First Paleontologist* (2020) by Linda Skeers Worksheets: Passage on Mary Anning Timeline Template Materials: White board and marker/ Easel pad paper and marker Pencils

General Classroom Differentiation	
Challenges and Supports (Differentiation for students who require additional challenges or supports in the classroom.)	**Content:** Verbal and written directions, verbal prompts, teacher guidance, visual time and verbal time reminders **Process:** Before the activity, the teacher will give verbal directions and directions will be printed on the worksheets for students to reference. During the activity, the teacher(s) will be walking around providing assistance to students and giving verbal reminders about the activity and time left. Advanced students will be directed to complete an extension activity in the final pages of the Paleontologist File. **Product:** With the variety of multimodal directions and supports, students will be equipped to complete the activity while exploring the subject of dinosaurs, paleontology, and biographies. If students struggle, they will be provided with one-on-one support during the activity and asked specific questions during class discussions to maintain participation and inclusion. If students need an additional challenge, they can work on enrichment activities individually or with a small group of their peers.
IEP Accommodations and Modifications	
IEP Accommodations (Environmental or instructional adaptations to assist the learner to access the curriculum as required by IEP or 504 plan.)	Students will be provided with a one-on-one aid during the timeline activity to assist in group work. Aid will read the passage aloud and prompt the student with questions/guidance when completing the template.

IEP Modifications (Changes to the curriculum for a specific learner IEP goals.)	No modifications were made for this lesson.

Opening of the Lesson	
Pre-requisite Skills/Prior Knowledge needed to participate for this lesson	What dinosaurs are and rough idea of when they lived, what fossils are and what they represent, how to place dates in chronological order, reading a one-page passage, pulling important information out of a passage, knowledge of classroom routines and etiquette
Introduction Activity (Include time allotted for activity)	• Introduce the book, *Dinosaur Lady* and explain to the students how the book is a biography about Mary Anning, the first paleontologist. Remind students what paleontologists are. • Ask students what they know about biographies. Flip to the glossary in the Paleontologist File and highlight the word biography. (If completing this lesson on its own, create a definition with students for both biography and timeline) • Ask students what they know about timelines and revisit the definition of timeline in the glossary. Have students highlight the word “timeline” in their glossary. Explain to students that we are going to use information in this biography to create a timeline. • **Goal** of the lesson: Use a biography to organize information in a timeline format. • Ask students pre-reading questions such as what they think the book will be about. • Read the book with minimal interruptions from the story. • After reading, ask the students if their predictions about the story were correct or not and ask them, “In what ways did this story give us a biography of Mary Anning’s life? Turn to page 37 in the *Dinosuar Lady* book and talk through the timeline shown. Allotted Time: 15 minutes

Body of the Lesson	
Describe experience step-by-step. Be concise and clear. What will the teacher DO, what will the students DO? Include key questions. List Step 1., Step 2., etc. (Include Time allotted for activity)	• After discussing key parts of Mary Anning's biography, pass out the timeline template worksheets and an additional short passage on Mary Anning's life (if completing the full interdisciplinary lesson, students will have these worksheets in their Paleontologist File). • As a class, fill out the timeline with the 5 events and their corresponding date from the passage on Mary Anning. Students should place the dates in order on the timeline and write a short description of what occurred on that date. If students seem to understand how to pull events out of the passage and place them on the timeline in order, have them complete the final two events on their own or in a small group. Students can color/decorate/ draw on the timeline if they get done before other students. Allotted Time: 20 minutes

Closing of the Lesson	
Closing Activity: Review critical content. Students share what they've learned. (Include Time Allotted for activity)	• After students complete the timeline, ask students to share out the final 2 events on the timeline, ensure they placed them in order on their template. Explain to students that there could be different timelines of Mary Anning's life (shorter, longer, more detail, less detail), but all timelines represent a biography of Mary Anning as it is an account of her life written by someone else. • Revisit the **goal** of the lesson: Use a biography to organize information in a timeline format. Ask students if we achieved this goal based on the timeline we created? As students again what a timeline is and how we used one today. • Ask the students what other information could be included in a timeline about Mary Anning's life that may not have been in the reading. Ask students how they would go about finding that information.

	Allotted Time: 5 Minutes
Preview next lesson.	Acknowledge curiosity about the fossils Mary Anning discovered, such as how really old pieces of history are dug up and preserved? Encourage students to take interest in fossils as a primary source and how paleontologists go about finding them.

Enrichment	
Extend or enrich learning outside of formal instruction.	Ask students to look for biographies on other platforms, such as in movies, TV shows, or the media/news and how the information can be organized into a linear progression like a timeline. Students can draw and write about a pet dinosaur or imaginative fossil discovery; a worksheet is in the back of the Paleontologist File. Students may also read other books, explore accredited websites, or watch videos to learn more about paleontology and dinosaurs as listed under additional resources.

Reflection	
Post-lesson thoughts	Students really enjoyed the book, the activity was slow, the timeline and passage need to be on the same page next time, lines on the timeline were too small to write, highlighting kept them engaged, and they eager to move ahead of the group with the timeline since it was right in front of them.

Appendix C

Science Lesson

Name	Karley Becker				
Subject/Learner	2nd Grade Science				
Content Focus (Unit Theme)	Dinosaurs / Prehistoric Animals				
Date of Lesson	**3/30/2022**	**# of Students**	**20**	**AM/PM All day**	**AM**

Learning Target	
Ohio Learning Standards Early Learning Standards	Theme: Life Science Topic: Interactions within Habitats Statement: 2.LS.2: All organisms alive today result from their ancestors, some of which may be extinct. Not all kinds of organisms that lived in the past are represented by living organisms today. (Main concepts: fossils and extinction)
IEP Goal (or 504, Gifted, Other Learning Needs)	The student will be able to read and answer comprehension questions about a text with 80% accuracy in 4 out of 5 trials as measured by teacher records.
Lesson Objective - must align with standards	Students will be able to recognize and explain that some organism today descended from dinosaurs (as explored through fossils) with adult assistance by the end of the lesson.
Assessments - must align with objectives. Include all formative and summative assessments for the lesson and documentation of evidence	Informal assessment checks of student's work, motivation/attention, and accuracy throughout the activity and during share out/wrap up discussions.

Instructional Strategies	
Academic Vocabulary (focus learner vocabulary for the lesson with definitions)	**Ancestor**: an early living thing that something descended from **Biography**: an account of someone's life written by someone else **Bones**: hard tissue making up a skeleton

	Chisel: hand tool used to cut or shape **Discover**: to find **Fossils**: preserved physical traces of past living things **Museum**: building in which historical objects are stored **Paleontologist**: scientist who studies fossils **Prehistoric**: time before written records **Scientists**: a person who studies science **Timeline**: a tool that organizes events in order
Universal Design Strategies (Presentation, Expression, Engagement) to reach all learners	**Presentation**: Reference to the text/illustration in the book will provide a visual example of what the students are going to complete during their fossil dig. Verbal and written directions and prompts will be given before and during the lesson. The short videos will also provide a visual and auditory representation of the content to spark discussion during the opening and closing of the lesson. **Expression**: Students will be completing a hands-on dig that will allow them to connect with Mary Anning and the tasks of a paleontologist. The observation notes grant them an opportunity to be creative in their interpretation of the activity and how it could relate to the field of paleontology even though it's a cookie! **Engagement**: The book will capture students' attention as Mary Anning's discoveries are fascinating to learn about. The actual dig is hands-on and motivating for students as they feel independent and in control of a real-life simulation of paleontology. Furthermore, the short videos provide simple, engaging information that supports the standard and objective of the lesson.
Classroom Management Strategies (grouping, transitions, attention signals)	**Grouping**: Students will work independently during the dig but will get the chance to share with another peer and the whole class their findings and how they interpreted them. **Transitions**: Students will remain in their seat during the lesson and will partner with a peer sitting close to them to minimize the need for physical transitions in the classroom. The bell will aid in directional shifts during the lesson.

	Attention Signals: Bell in front and back of the classroom to gain student's attention in between or during activities/lessons.
Materials and Resources List Include any worksheets or craft examples that will be used in the lesson (if needed attach at the end of the lesson plan). Insert YouTube or Pinterest or any other link to a web-based resource.	Book: *DINOSAUR LADY: The Daring Discoveries of Mary Anning, the First Paleontologist* (2020) by Linda Skeers Worksheets: Cookie/Fossil Observation Materials: Chewy Chips Ahoy Cookies Paper plates Small paint brushes Toothpicks

General Classroom Differentiation	
Challenges and Supports (Differentiation for students who require additional challenges or supports in the classroom.)	**Content:** Verbal and written directions, verbal prompts, teacher guidance, visual time and verbal time reminders. **Process:** Before the activity, the teacher will give verbal directions and directions will be printed on the worksheets for students to reference. During the activity, the teacher(s) will be walking around providing assistance to students and giving verbal reminders about the activity or time left. Aid will repeat instructions and guide the completion of the activity while sitting next to a student who needs additional support. For students who finish the activity quickly or need a challenge, can explore the fossil activities on the American Museum of National History website (link is on the last page of the file). **Product:** With the variety of multimodal directions and supports, students will be equipped to complete the activity while exploring the subject of fossil finding. If students struggle, they will be provided with one-on-one support during the activity and closing think-pair-share to provide conversational prompts and directions. If students need a challenge, they can explore other information about fossils on the given websites and resources.

IEP Accommodations and Modifications	
IEP Accommodations (Environmental or instructional adaptations to assist the learner to access the curriculum as required by IEP or 504 plan.)	Students will be given one-on-one aids to help them complete the observation notes after the cookie dig. Aid will prompt the students to think about the connections they can make to paleontology or fossil hunting and will write a description of the fossils for the student on the worksheet.
IEP Modifications (Changes to the curriculum for a specific learner IEP goals.)	No modifications were made for this lesson.

Opening of the Lesson	
Pre-requisite Skills/Prior Knowledge needed to participate for this lesson	What a paleontologist is, how fossils are found, what fossils are, how to dig up something, social skills to converse with a peer (take turns talking and share appropriate responses)
Introduction Activity (Include time allotted for activity)	• Pull up the pages in the book, *Dinosaur Lady,* that show the fossils Mary Anning found and her observation notes (pg. 5, 12, 14, 16) • Ask students how Mary Anning found these fossils and what the fossils represent. • **Goal** of this lesson: Understand what fossils are and what they can tell us about the past and present. • Watch this short video- https://www.nhm.ac.uk/discover/why-are-birds-the-only-surviving-dinosaurs.html • Have a discussion about what fossils could tell us about living organisms today? Ensure students understand dinosaurs do not live on earth anymore, but their ancestry (family of living things) still has a history on earth, such as birds. Birds and dinosaurs share many similar characteristics such as scales, feathers, hallow bones, and claws. But birds also have big differences from their dinosaur ancestors. • Ask students, how did we find these really old fossils and bones if they lived so long ago? Transition in this short video on how fossils are formed. • Watch a short video on fossils-

	https://www.nhm.ac.uk/discover/how-are-fossils-formed.html • Explain that some fossils look similar to plants and animals that are alive today, while others are very different from anything alive today. Allotted Time: 10 Minutes

Body of the Lesson	
Describe experience step-by-step. Be concise and clear. What will the teacher DO, what will the students DO? Include key questions. List Step 1., Step 2., etc. (Include Time allotted for activity)	• Tell students that they are all paleontologists today so they must do an actual fossil dig. Tell students they will be given a chocolate chip cookie and must use their digging tools to remove all the chocolate chips from the cookie. The cookie represents the rock that preserved the fossils, and the chocolate chips represent the fossils –make connections to the fossil formation video. • As the cookies, plates, and tools are being passed out, ask students how this dig is similar to the digs Mary Anning performed? • Give students time to complete their dig. • As students are finishing their dig, pass out the cookie observation notes worksheet (if completing this lesson as part of the full interdisciplinary lesson, the worksheet will be in the Paleontologist File). • Have students draw a picture of the “fossils” they discovered and write a short description about them just as Mary Anning did in the book to create her observation notes. • This will be their very first documentation of their work as paleontologists! Allotted Time: 30 minutes

Closing of the Lesson	
Closing Activity: Review critical content. Students share what they’ve learned. (Include Time Allotted for activity)	• Think-pair-share: ask students to think about their findings and what they represent, then share with a partner sitting next to them, then the

	teacher will ask the class to share their thoughts about the reality of how many chocolate chips they dug up or what they could represent as fossils (such as teeth or small shards of bone). • Revisit the **goal** of the lesson: Understand what fossils are and what they can tell us about the past and present. Ask students, what could our cookie fossils tell us about other cookies? How could this cookie fossil representation relate to the ancestry video we watched at the beginning of the lesson? Allotted Time: 5 minutes
Preview next lesson.	Ask students to think about how fossils can range in size. Could fossils be as tiny as a baby tooth and as big as a parking lot? Size can vary based on the animal it came from or how well it was preserved.

Enrichment	
Extend or enrich learning outside of formal instruction.	Encourage students to keep an eye out for artifacts from the past. Encourage them to dig outside or in the sand and see what they can discover. Students can measure their fossil findings (chocolate chips) with a ruler at the end of the lesson and see whether they vary in size. Students can also read other books, explore accredited websites, or watch videos to learn more about paleontology and dinosaurs as listed under additional resources.

Reflection	
Post-lesson thoughts	The students really enjoyed this lesson, they really took on the paleontologist persona, they worked carefully and slowly, they dug around the chips first, they very excited about cookies but also talked about fossils and what they can infer about them, they used the tools properly, it was good fine motor practice but the student with autism was very overwhelmed and did not participate much.

Appendix D

Math Lesson

Name	Karley Becker				
Subject/Learner	2nd Grade Mathematics				
Content Focus (Unit Theme)	Dinosaurs / Prehistoric Animals				
Date of Lesson	**3/30/2022**	**# of Students**	**20**	**AM/PM All day**	**PM**

Learning Target	
Ohio Learning Standards Early Learning Standards	Topic: Measurement and Data Strand: Measure and estimate lengths in standard units. Statement: 2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
IEP Goal (or 504, Gifted, Other Learning Needs)	The student will be able to read and answer comprehension questions about a text with 80% accuracy in 4 out of 5 trials as measured by teacher records.
Lesson Objective - must align with standards	Students will be able to measure objects accurately 2 out of 3 times with the appropriate measuring tools by the end of the year.
Assessments - must align with objectives. Include all formative and summative assessments for the lesson and documentation of evidence	Informal assessment checks of student's work, motivation/attention, and accuracy throughout the activity and during share out/wrap up discussions. The teacher will also chart student answers on measurement worksheets for accuracy.

Instructional Strategies	
Academic Vocabulary (focus learner vocabulary for the lesson with definitions)	**Ancestor**: an early living thing that something descended from **Biography**: an account of someone's life written by someone else **Bones**: hard tissue making up a skeleton **Chisel**: hand tool used to cut or shape

	Discover: to find **Fossils**: preserved physical traces of past living things **Museum**: building in which historical objects are stored **Paleontologist**: scientist who studies fossils **Prehistoric**: time before written records **Scientists**: a person who studies science **Timeline**: a tool that organizes events in order
Universal Design Strategies (Presentation, Expression, Engagement) to reach all learners	**Presentation**: Reference to the text/illustration in the book will provide a visual example of what the students are going to measure. Verbal and written directions and prompts will be given before and during the lesson. **Expression**: Students will be asked to create a visual presentation of the fossil skeletons Mary Anning discovered, rather than just practicing measurement skills on paper. Students will use yarn or chalk to demonstrate the length of these animals while recording their findings on their paper. Students will also share about the activity and how it is relevant to paleontology. **Engagement**: Students will get the chance to stand up and move their bodies while working with another peer (and go outside if possible). This activity is both hands-on and active for students which will interest and motivate them to measure and investigate the sizes of prehistoric animals.
Classroom Management Strategies (grouping, transitions, attention signals)	**Grouping**: Students will be in pairs or teams of three as determined by their teacher (they can be random or students next to each other) to work together towards creating a visual and accurate representation of both animals. This activity will require them to share responsibility and ideas with one another. Students will also share out in a whole group setting. **Transitions**: After gaining students' attention using the bell, students will line up at the door before going outside and when coming back in. Students will be dismissed in groups to line up and asked to remain quiet when walking through the school. Students who cannot follow directions when walking in and out of the classroom will be required to stay inside and complete the activity with an aid.

	Attention Signals: Bell in front and back of the group to gain student's attention in between or during activities/lessons. Remind students that paleontology requires a lot of focus and to focus effectively we need a calm, collective environment.
Materials and Resources List Include any worksheets or craft examples that will be used in the lesson (if needed attach at the end of the lesson plan). Insert YouTube or Pinterest or any other link to a web-based resource.	Book: *DINOSAUR LADY: The Daring Discoveries of Mary Anning, the First Paleontologist* (2020) by Linda Skeers Worksheets: Measurement worksheet Materials: Pencils Clipboards Measurement tools (ruler, yard stick, tape measure) Chalk/yarn

General Classroom Differentiation	
Challenges and Supports (Differentiation for students who require additional challenges or supports in the classroom.)	**Content:** Verbal and written directions, verbal prompts, teacher guidance, verbal time reminders, peer guidance and support. **Process:** Before the activity, the teacher will give verbal directions and directions will be printed on the worksheets for students to reference. During the activity, the teacher(s) will be walking around providing assistance to students and giving verbal reminders about the activity or time left. Aid will repeat instructions for students. Students will be paired with peers at a similar level to retain a collaborative attitude during the lesson. For students who need an additional challenge, they can complete the measurement activity in the back of the Paleontologist File. **Product:** With the variety of multimodal directions and supports, students will be equipped to complete the activity while exploring the connection between fossils and measurement. If students struggle, they will be provided with conversion assistance written on their paper. Students who are finished with the activity may also offer to help explain or guide students who are having difficulty measuring or making the conversions.

IEP Accommodations and Modifications	
IEP Accommodations (Environmental or instructional adaptations to assist the learner to access the curriculum as required by IEP or 504 plan.)	Students will be paired with an aid to repeat instructions and provide verbal prompts. Students will also be paired with a peer of similar level to work with. If students struggle, the teacher/aid will write the feet, inches, and yards conversion on their paper to assist them.
IEP Modifications (Changes to the curriculum for a specific learner IEP goals.)	No modifications were made for this lesson.

Opening of the Lesson	
Pre-requisite Skills/Prior Knowledge needed to participate for this lesson	How to use measurement tools, when to use which measurement tool, how to convert measurements using math equations or counting (modeling with mathematics), social skills to partner with a peer(s)
Introduction Activity (Include time allotted for activity)	• Ask students what kind of numbers or measurements could play a role in fossil digs or investigations? Have a conversation about how math would play a role in paleontology work. • **Goal** of the lesson: Determine what measurement tool to use when. Allotted Time: 3 Minutes

Body of the Lesson	
Describe experience step-by-step. Be concise and clear. What will the teacher DO, what will the students DO? Include key questions. List Step 1., Step 2., etc. (Include Time allotted for activity)	• Pass out measurement worksheet and have students get in pairs or groups of three (if completing the full interdisciplinary lesson, the worksheet is in the Paleontologist File). • Open to the page in the *Dinosaur Lady* that shows the fossil replica of the ichthyosaur (pg. 14). Tell the students that the ichthyosaur that Mary Anning found was a 17ft long skeleton and have them record that number on their worksheet. Turn to the page in the book that shows the fossil replica of the pterosaur (pg. 25/26) that Mary discovered and tell the students that it was 9ft long and have them record that number on their worksheet. Students could also

	use the internet or an informational passage on Mary Anning to find and record these lengths. • Next, have the students go outside and work together to measure and draw with chalk a line that is the size of the ichthyosaur and the pterosaur she discovered. Use yarn inside if the weather does not permit. • Students must choose a measurement tool (ruler, yard stick, tape measure, etc.) and accurately represent the size of these animals. Students must also make conversions as they need to find out the length of these animals in both inches and yards and record them on the worksheet. Allotted Time: 35 Minutes

Closing of the Lesson	
Closing Activity: Review critical content. Students share what they've learned. (Include Time Allotted for activity)	• Revisit the **goal** of the lesson: Determine what measurement tool to use when. Ask students if they were to find one of these fossil skeletons in real life, what measurement tool would they use to find the length of the skeleton? • Ask students how this information could be relevant for people in field of paleontology (example responses, to gauge how they are going to transport the fossils, to determine how much space the exhibit will take up in a museum, to predict the sizes of other extinct animals, etc.) Allotted Time: 5 Minutes
Preview next lesson.	After doing these tasks as paleontologists, how could we get this information out to the public to teach others about our findings? What media forms do scientists use to inform the public and what information would others want to hear or read about? How do you go about finding information?

Enrichment

Extend or enrich learning outside of formal instruction.	Challenge students to use measurement as a tool in their everyday life. Use their height as an estimation tool and use equations to compare measurements to one another, such as observing that the tree is taller than me and I am taller than the bush. Students can complete a measurement enrichment worksheet independently located in the back of the Paleontologist File. Students can also read other books, explore accredited websites, or watch videos to learn more about paleontology and dinosaurs as listed under additional resources.

Reflection	
Post-lesson thoughts	The students enjoyed going outside, they were able to do the conversion but not as engaged once they came back inside, after making the length of the dinosaurs they made references to the size in comparison to other animals, they understood that their length represented what Mary Anning found, they referenced the book and timeline of her life, and they were eager to use measurement tools.

Appendix E

Language Arts Lesson

Name	Karley Becker				
Subject/Learner	2nd Grade ELA				
Content Focus (Unit Theme)	Dinosaurs/ Prehistoric Animals				
Date of Lesson	**3/30/2022**	**# of Students**	**20**	**AM/PM All day**	**PM**

Learning Target	
Ohio Learning Standards Early Learning Standards	Topic: Reading Standards for Informational Text K-12 Strand: Craft and Structure Statement: RI.2.5 Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.
IEP Goal (or 504, Gifted, Other Learning Needs)	The student will be able to read and answer comprehension questions about a text with 80% accuracy in 4 out of 5 trials as measured by teacher records.
Lesson Objective - must align with standards	Students will be able to pull information out of key features in a nonfiction text in order to organize and record the information with adult assistance by the end of the lesson.
Assessments - must align with objectives. Include all formative and summative assessments for the lesson and documentation of evidence	Informal assessment checks of student's work, motivation/attention, and accuracy throughout the activity and during share out/wrap up discussions. The teacher will also chart the students' accuracy of findings and organization within the sections of the graphic organizer to determine their level of understanding.

Instructional Strategies	
Academic Vocabulary (focus learner vocabulary for the lesson with definitions)	**Ancestor:** an early living thing that something descended from **Biography**: an account of someone's life written by someone else

	Bones: hard tissue making up a skeleton **Chisel**: hand tool used to cut or shape **Discover**: to find **Fossils**: preserved physical traces of past living things **Museum**: building in which historical objects are stored **Paleontologist**: scientist who studies fossils **Prehistoric**: time before written records **Scientists**: a person who studies science **Timeline**: a tool that organizes events in order
Universal Design Strategies (Presentation, Expression, Engagement) to reach all learners	**Presentation**: Children's book will provide visual and auditory learning of Mary Anning's experiences in the beginning of the lesson. The graphic organizer will provide a visual way for students to organize and record their findings and make it easier to compare and contrast their findings with other students. **Expression**: Students will be able to share out with the class and work independently. When working independently, students will be able to choose the animal they want to focus on and control the places they pull their information from to record on their graphic organizer. **Engagement**: Students have a free choice during the activity, allowing them to feel in control and pick an animal that interests them the most. The graphic organizer will also engage the students as it will help them organize their information and limit their searches without feeling overwhelmed.
Classroom Management Strategies (grouping, transitions, attention signals)	**Grouping**: The introduction and closing of the lesson will be a whole group discussion asking students to share their thoughts and curiosities. Students will work individually on the graphic organizer but many converse with a peer on what they are learning or where they are gathering their information from. Teachers should encourage this natural collaboration as the students can learn from one another and teach one another. **Transitions**: In between the carpet and individual work time, students will be dismissed back to their seats based on the color clothes they are wearing that day. When sharing with the class after completing the graphic organizer, the students will be asked to share

	based on the size of the animal they chose. These transition plans will maintain a calm and welcoming classroom environment. **Attention Signals**: Bell in front and back of the classroom to gain student's attention in between or during activities/lessons.
Materials and Resources List Include any worksheets or craft examples that will be used in the lesson (if needed attach at the end of the lesson plan). Insert YouTube or Pinterest or any other link to a web-based resource.	Book: *DINOSAUR LADY: The Daring Discoveries of Mary Anning, the First Paleontologist* (2020) by Linda Skeers Worksheets: Dinosaur graphic organizer Materials: Pencils Internet/ book resources

General Classroom Differentiation	
Challenges and Supports (Differentiation for students who require additional challenges or supports in the classroom.)	**Content:** Verbal and written directions, verbal prompts, teacher guidance, verbal time reminders, peer guidance and support. **Process:** Before the activity, the teacher will give verbal directions and directions will be printed on the worksheets for students to reference. During the activity, the teacher(s) will be walking around providing assistance to students and giving verbal reminders about the activity or time left. Aid will repeat instructions for students. For advanced students, they can complete the figurative language activity in the back of the paleontologist file individually or with a group of peers. **Product:** With the variety of multimodal directions and supports, students will be equipped to complete the activity while exploring their own personal interests in their animal of choice. If students struggle, they will be provided with directions when looking up information and prompts for time management and peer support. If students need a challenge, they can do a deep dive into their animal and provide more information than required

	or complete the figurative language activity with the book, *Dinosaur Lady*.
IEP Accommodations and Modifications	
IEP Accommodations (Environmental or instructional adaptations to assist the learner to access the curriculum as required by IEP or 504 plan.)	Students will be given one-on-one aid to repeat directions and narrow the resources they will use to pull information from. Peers may also offer to support or help a student record or research information.
IEP Modifications (Changes to the curriculum for a specific learner IEP goals.)	No modifications were made for this lesson.

Opening of the Lesson	
Pre-requisite Skills/Prior Knowledge needed to participate for this lesson	Basic knowledge of how to find information in books and online, knowledge of how to navigate Epicbooks, how to organize information from a text, background on dinosaurs, understanding of key features of a text and how to use them
Introduction Activity (Include time allotted for activity)	• Introduce (or reintroduce) the book the *DINOSAUR LADY: The Daring Discoveries of Mary Anning, the First Paleontologist* (2020) by Linda Skeers and give a short background on Mary Anning. • Tell students that while reading the book, pay specific attention to the discoveries Mary Anning made and how she collected, recorded, and shared her information/findings. • Based on the book the *Dinosaur Lady*, ask students what kind of information Mary Anning needed to or wanted to find out about her discoveries. How did she or how would she go about finding out this information? Are there any particular facts that you would want to learn about Mary Anning's discoveries? (ex. What they eat, where they lived, how long they lived, if they were nice or mean, how they interacted, etc.) • **Goal** of the lesson: Use nonfiction text features to find information effectively. • Introduce another nonfiction book and review the key features of the text- glossary, index, text, captions, bold print. Explain that the *Dinosaur*

	Lady is a nonfiction book, but most nonfiction books have text features that can help us find information. Walk through the nonfiction book and show students how they can use the text features to find information to record on the graphic organizer. For example, the teacher may pick their own animal and demonstrate using a nonfiction book to gather information needed to fill in the graphic organizer. Allotted Time: 15 Minutes

Body of the Lesson	
Describe experience step-by-step. Be concise and clear. What will the teacher DO, what will the students DO? Include key questions. List Step 1., Step 2., etc. (Include Time allotted for activity)	• Explain to students that their next task as paleontologists is to discover and explore their own extinct animal. • Pass out graphic organizer to all students (if completing the full interdisciplinary lesson, the worksheet is in the Paleontologist File). • Have students research or use books (getepic.com) to fill in their graphic organizer. Students must pick an extinct dinosaur to look up and find facts about. Students may choose to include any information they wish in the graphic organizer as long as they organize and record the information accurately (this activity can be broken up into two parts if need be- may take students a while to find and record the information) Allotted Time: 30 Minutes

Closing of the Lesson	
Closing Activity: Review critical content. Students share what they've learned. (Include Time Allotted for activity)	• Have students share out loud about their discoveries. Students should share their animal's name and facts/information they learn about that specific animal. Ask students if they noticed similarities between Mary Anning's animal discoveries and their own. • Revisit the **goal** of the lesson: Use nonfiction text features to find information effectively. Ask

	students what text features they found the most useful when trying to find specific information. • Ask students what they learned today and to name some of the tasks they completed as paleontologists. • Give students a personalized certificate of paleontology for all their hard work as paleontologists! Allotted Time: 5 Minutes
Preview next lesson.	N/A

Enrichment	
Extend or enrich learning outside of formal instruction.	Encourage students to look at informatory texts/media in their daily life, such as newspapers, news channels, books, magazines, online articles, etc. Ask them to consider how they are similar and different from one another and where they or their parents receive most of their information from. Also challenge students to recognize and use nonfiction text features when reading books. Students can complete the figurative language worksheet that asks them to look at and consider some of the language used in the book, *Dinosaur Lady*. Students can also read other books, explore accredited websites, or watch videos to learn more about paleontology and dinosaurs as listed under additional resources

Reflection	
Post-lesson thoughts	The students liked learning about their own animal, they either choose epic books or real book, they used the table of contents to find information, they were interested in learning more about their animal and sharing about it, one student read about the ichthyosaur and learned about Mary Anning in a different book.

Appendix F

Paleontologist File

Appendix G

Exit Slip

Name: _____

Date: _____

1. Name two things you learned today.

2. Name one of the vocabulary terms from today and define it in your own words.

3. Would you want to become a paleontologist?

   Yes No

4. Did you like the book, *Dinosaur Lady*?

5. Did you enjoy the activities today?